UNIVERSITY OF TARTU
Faculty of Economics
and Business Administration

PIERO FORMICA

INDUSTRY AND KNOWLEDGE CLUSTERS
Principles, Practices, Policy

UNIVERSITY OF TARTU
Faculty of Economics
and Business Administration

INDUSTRY AND KNOWLEDGE CLUSTERS

Principles, Practices, Policy

Piero Formica

TARTU UNIVERSITY PRESS

Piero Formica is Dean of the International University of Entrepreneurship at Ijmuiden — Amsterdam and Visiting Professor at the Faculty of Economics and Business Administration — University of Tartu and at the Postgraduate School of Business Law — University of Bologna (where he has been member of the Board of Directors between 1988 and 1992). His previous books include Frontiers of Entrepreneurship and Innovation. Readings in Science Park Policies and Practices, Tecnopolis: Lugares y senderos de la innovación and Mutanti Aziendali: Imprese, centri di innovazione e parchi scientifici nell'era tecnopolitana.

Piero Formica
Industry and knowledge clusters. Principles, Practices, Policy

Language editor George W. B. Earl of Carlisle
Technical assistant Merike Kaseorg

ISBN 9985–56–724–2

Tartu University Press
Order no. 72

For

Flora and Nicola, Lucia, Benedetta and Lillo,

Lina and Edda, Ciccio and Nerina:

To their memory in affection

CONTENTS

LIST OF TABLES, FIGURES AND EXHIBITS

TABLES. CHAPTER ONE

CHAPTER TWO

FIGURES. CHAPTER ONE

CHAPTER TWO

CHAPTER TWO

PREFACE

In 1890 Alfred Marshall published his "Principles of Economics" in which he included a chapter on "industrial districts", as he defined the geographic concentrations of specialised industries. After the Second World War the term "industrial district" has been applied to the emergence of economic specialisation in specific communities in Italy, mostly in the northeast regions of the country. A century later from Marshall's book, Michael Porter's neo-Marshallian cluster concept has burst on the scene through a series of seminal articles (Porter 1998a, 1998b, 2000). By the time this book come to fruition we are at the height of a cluster boom. Economists, sociologists, demographers, ecologists, biologists, and policymakers debate cluster theories and practices. Every year, hundreds of weighty tomes and books on clusters pour out of the universities and think tanks assessing the significance of past events, investigating the consequences and discussing what will be done in the future. International conferences are held on the topic and specialised, government-driven agencies have been established with the purpose of creating clusters and improving cluster development. All in all, it is fashionable to say that "we are all cluster supporters now".

There are also institutions such as the European Commission — Information Society Directorate General that see the cluster phenomenon in the perspective of the early literature on

growth poles, holding the view that there does exist a certain kinship between clusters and growth poles — according to the seminal research on growth poles going back to Francois Perroux's work in the 1950s (Perroux 1950, 1955). In *A Newsletter on New Methods of Work & e-Commerce* (July 2002, No 17) published by that Director General it is stated that the growth pole "was concerned with the transport of physical goods and, for this reason, stressed the importance of physical proximity to the eventual success of a given growth pole. Work on clusters also stresses the importance of physical proximity, but with a much greater stress on face-to-face knowledge flows than on the flow of physical goods. Here, the paradigm case of a successful cluster is Silicon Valley. Both the flow of goods and the flow of knowledge, however, share a common requirement to mitigate the negative effects of spatial distance... we integrate the growth-pole and cluster concepts into a single term: the growth-node".

Seductive though the cluster concept is as a motor of growth, there is much about it that is problematic The terminology is used in a quite cavalier manner and, on the other hand, the character of the concept poses a problem of definitions. Indeed, the concept of cluster in social science inhabits the realm of speculation rather than science. As scholars and experts of this subject have been increasingly looking at the "softer" attributes of clusters — trust, social capital, leadership, teamwork, networking, creativity, and the like — it has become increasingly difficult to assess with any rigour whether their hypotheses are true or false. Recent attempts by the OECD to construct a trust indicator shows that the research community has taken a course of action that is in harmony with the needs of a scientific approach to the cluster economy.

Clusters can be likened to the living organisms in the rain forest populated by a number of species with a wide range of attitudes, such as those of the parasite, the predator, the symbiont, and the table companion, which will be described in

Chapter 1. In the rain forest what is valuable is the internal design, which means relationships. The quality of relationships in a cluster is heavily affected by that of social capital, which is a set of conventions, values and beliefs shared by everybody's interaction, common working styles and overlapping objectives. The quality of social capital tends to reflect the special characteristics of a particular cluster community in terms of mores, manners, and in the hearts and minds of those who live in it. Social capital thus differs from one cluster to another, and each cluster is unique as is the case in the rain forest where of two identical organisms only one survives. Clusters are 'one-of-a-kind' and not 'one-size-fits-all' living organisms. This is the reason why we have elected some test cases for analysing the conditions for emergence and development of clusters.

*****

Although in the cluster literature it is an entrenched contention and even a cherished belief the argument that people and their interpersonal relationships are the life-blood of clusters, a careful scrutiny is required in order that such confidence will not sadly prove to be misplaced. If we focus our attention on the forces that create and develop clusters, a line can be drawn between relations that portend a loss of personal autonomy and others that, conversely, magnify the independence of each and every individual inside a given relation.

In the first instance the individuals are "insiders" subordinated to the norms and procedures of the organisations to which they belong. They act "in the name or on the behalf of" and end up doing what the organisation is resolved to do. We term "industry clusters" those clusters where it is not the individuals but the organisations that hold the whole show together.

In the second instance the clustering process takes root in the ground of lateral or longitudinal relations, which refer to interpersonal exchanges that are developed by individuals in their

own capacity (to wit: "outsiders") rather than as representatives' organisations. These individuals form affinity groups or communities of knowledge practice, which coalesce in knowledge pools that, in turn, forge what we call "knowledge clusters".

Theodore Zeldin in his *Intimate History of Humanity* has noted that affinity groups are those intermediaries or catalytic agents who "can create new situations and transform people's lives by bringing them together" (Zeldin, 1994: 155). By the way, it is emphasised that "affinity" was the word used by Newton and Goethe (*Elective Affinities* is one of the most famous of Goethe's books) in relation to the chemical phenomenon (later on known as catalysis) of two substances that combine to form a third one.

If in industry clusters the organisations give orders to people "where to go", then in knowledge clusters, the individuals are able to use their knowledge autonomously and effectively in taking decisions. The distinctive features of collaboration between individuals without the hierarchical ties, which bind industry clusters, are the openess of the exchanges (there is a grey area between insiders and outsiders, both of them using the same lingua franca made up from several languages), the ability to question the routines and, as a consequence, the radically innovative mental tools and experiments to turn knowledge into innovation.

There are authors who have already used knowledge clusters as models for their investigations. For example, Debra Amidon's (2002) setting of the *Innovation SuperHighway* brings to the forefront of the scene in her "innovation theatre" the practitioners who often "extend their position of leadership beyond the boundaries of their enterprise or nation". They are examples of "knowledge applied to action, [which is] the process of innovation". The knowledge cluster perspective is also discernible in Leif Edvinsson's (2002) exploration of the "corpo-

rate longitude" side of the firm, which highlights knowledge workers who "navigate east-west" (instead of accounting analysts who navigate "north-south") so as to capture the real value of the firm, which normally does not reside in the balance sheets — to wit: "its intellectual property rights, knowledge recipes, and solutions coming from a knowledge outsider". Amidon's and Edvinsson's studies reinforce the famous assertion made by Peter Drucker in his Post-Capitalist Society (1993): "In the knowledge society the most probable assumption and certainly the assumption on which all organizations have to conduct their affairs is that they need the knowledge worker far more than the knowledge worker needs them".

That knowledge clusters are highly conducive to innovation holds a two-fold meaning. In one respect, innovative products, services and organisations, which have been incubated within the knowledge clusters, will form tomorrow's high growth rate industry clusters. The American Entrepreneurial Revolution (Jeffry, 1999) to which we make reference in Chapter Two is the most vibrant example of this evolution. From another viewpoint, knowledge clusters innervate, nourish and provoke innovation processes within the fabric of today's industry clusters.

Distilling wealth creation from the work of knowledge clusters requires the ability of combining production of knowledge with devices for disseminating it as widely as possible, and the aptitude of the organisations and individuals concerned to absorb and use it.

There are deep cultural roots that may propitiate or prevent this from happening. Even for the most advanced industrial economies it is a hard struggle to capture the potential benefits of the modern-day knowledge society. The path towards a new age of prosperity by applying knowledge to business is full of traps. The industrial culture, mainly focused on the production

of objects, does not help to understand the very nature of knowledge, which is that of a flow and not of goods.

The configuration of the industrial economy as a set of industries drives policymakers and even businesspersons re-labelling knowledge clusters as the existing industry clusters since a new, knowledge-intensive industry has been added to them. From this view, people believe they can buy pieces of knowledge from a knowledge firm as they usually buy goods and services. What is missed is the importance of managing knowledge for doing current businesses in a different way or for introducing innovative activities. In this respect, communities, which are free of the cumbersome aftermath of the Industrial Revolution, are in a unique position. Their ability to detect and manage knowledge sources, flows and processes instead of objects gives them instinctive and intuitive ways of understanding the business context of knowledge issues. These types of communities challenge the ways industry clusters behave and think, today.

Entrepreneurs are the engines of the cluster economy. In the past, their average educational attainment has been even lower than a secondary education. Through practical experience they have been exposed to the entrepreneurial process. Today an increasing number of nascent entrepreneurs hold a university degree. Their exposure to the entrepreneurial process is a mixture of formal education and experience in the field. New types of educational institutions — the entrepreneurial universities, described in Chapter 2 — extend the boundaries of the entrepreneurial education so as to bind stronger links between the entrepreneur and the innovation process. In Chapter 2 we expound the reasons why knowledge clusters are the kind of environment we need for creating healthy and dynamic entrepreneurial universities: those who can thrive by satisfying the demand of a better entrepreneurial education — which can, in turn, help the nascent entrepreneur to become a more competent person in the process of innovation.

*****

Public authorities have shown themselves eager to use their powers to intervene in the organisation of the cluster economy. Thus cluster policy making has come to be accepted as an established fact and it is now entirely within the scope of policymakers. They subscribe to the principle that spontaneous and uncontrolled efforts of individuals provoke market failures or markets that produce only short-term results. Cluster building is a long-term process that requires a strategic enabling factor. This is associated with a mode of governance based on policymakers' deliberate actions.

In this respect, our view, in line with the sort of criticism that Martin and Sunley (2002) have been voicing, is that under the principle of government intervention for cluster-building lies the influence of Porter, his disciples and followers, who have first created an intellectual product called "cluster" and then have turned it into a successful brand, which has been extensively sold to policymakers and a vast group of practitioners and consultants surrounding them.

The shape of public policy has, unfortunately, taken something of a back seat in the cluster research agenda. Following on from the pioneering work of Vernon Smith (2000), the 2002 Nobel Laureate in Economics, in the field of experimental economics, efforts should be made towards the creation of laboratory experiments to test different institutional environments for clusters. There are many questions that remain to be answered. For example, is there really a need for cluster policy-making? Which types of social norms, rules and choices would better help to change the pace of development through a process of cluster building? And what if participants in the economic arena are willing to find, by means of the market mechanism, their own way in order to change themselves and their communities?

In Chapter 3 the 'state' mode of governance is analysed through its privileged instrument of intervention — that is, the bureaucratic facilitating agency, which is an intermediate body between the market and the state formed by means of collaboration between the government and the private sector organisations (the so called "public-private partnership"). The agency is a syndicalist or corporative body that replace the impersonal and anonymous mechanism of the market by its own deliberate actions in order to reach common chosen goals. Paraphrasing Hayek's *The Road to Serfdom* (1944), we can say that in the policymakers' state of mind the agency is like "the gardener who tends a plant [read "cluster"] in order to create the conditions most favourable to its growth".

The agency is the result of government intention according to "the highly debatable idea that there are cluster 'blueprints' that can be readily implemented in quite different local economic, social and institutional contexts" (Martin, Sunley, 2002: 42). In Chapter 3 consciously constructed blueprints are challenged by a mode of governance driven by a large number of agents spontaneously self-organised, automatic co-ordinated, interacting and evolving dialectally in the marketplace (we call them "free agents") — as it happens in a complex adaptive systems (Stacey, 1996: 347).

Small firms can succeed if they have access, apart from physical infrastructures, to intangible resources — basically these are services such as specialised training, research, technology transfer, technical support, financial advice, marketing and design services, and information. These can be envisaged either as "private" services the provision of which is the outcome of seminal, market driven interventions by profit-seeking free agents in the marketplace or as "club" services whose conceptual foundations can be detected in the theory of clubs (Buchanan, 1965; Casas-Pardo *et al.*, 2001). In our context clubs take the shape of agency-originated business service centres which back the costs of producing services partly by

admission fees and fees for utilising a specific service paid by its members, and partly through a government fund raising mechanism. In the club framework free agents are bound to the ruling elite of the agency and they are 'free' only in terms of adjusting their activities to the agency's deliberate control.

The agency monopolistic stance inevitably develops a full range of pathologies such as patronage systems to prevent the emergence of competition, organisational dystrophy triggered off by a bloated bureaucracy, and unresponsiveness. These diseases unavoidably sap free agents' energies.

The agency also distorts competition by managing subsidies and raising artificial barriers to entry into the "subsidies market". In one way, companies become addicted to handouts. In another, grants encourage the agency to lobby different government levels for more money, while, in consequence, a larger bureaucracy is created to handle those subsidies.

All this explains why, in terms of policy, we have attempted in this book to set the tone for an unfolding array of arguments which make all the more urgent the need to highlight the profound cultural clash between the genuine entrepreneurial nature of the cluster community and the mode of governance through the agency's bureaucratic apparatus.

*****

I have, in the course of preparing this treatise, received most valuable support and assistance from Dr Lex de Lange, CEO of the Zernike Group in Groningen. Lex has been a trustworthy guide and invaluable ally in making this book possible. I also received help from the Earl of Carlisle. I owe a long-standing debt of gratitude to George Carlisle, who worked hard to put the manuscript into a clearer and more readable form. He read the proofs with great patience and dedication improving the text where necessary without changing the meaning or detract-

ing from my style. I had never encountered this before during my literary career.

I owe too a great debt to all the staff at the Zernike Group worldwide. They are too many to name, but their friendship and assistance to me in all the phases of this book has been precious.

In the two years I served as Senior Research Fellow at the Enterprise and Development Centre at the Business School of the University of Central England in Birmingham, its Director, my colleague Professor Jay Mitra, offered outstanding assistance in providing informed critiques. In addition, education programmes and seminars promoted by Jay have helped me shape this book.

I remain deeply appreciative to Bob Gibbs, Director of Development at the University of Nottingham Institute for Enterprise and Innovation for having given me the invaluable opportunity to present my preliminary work on clusters at the International Masterclass on "Commercialisation, Clusters and Competitiveness", which he organised throughout 2002 in partnership with the Zernike Group. I benefited enormously from key insights, views and experience delivered by the participants to the Masterclass.

I have built upon the foundations of others and have had indispensable help through picking the brains of colleagues from of Entovation 100 Network, first and foremost its architect and visionary leader Dr Debra Amidon. Debra's enthusiasm, vision, creativity and vast skill have had an important influence on me.

I am also indebted to Professor Tom Cannon, Managing Editor of the New Academy Review. Tom has contributed greatly to the concepts advanced in Chapter Three on cluster policy.

Finally, I am extremely grateful to my new institutional base and academic family — the University of Tartu. In particular I

should live to express my gratitude to the Pro-rector, Professor Hele Everaus, and to the Deputy Dean at the Faculty of Economics and Business Administration, Professor Urmas Varblane. Hele and Urmas have been most loyal supporters of this book.

As it usually happens with those caught up in an apparently endless work schedule, my wife Paola, members of my family and close friends have been, in their different ways, especially patient and helpful. Their understanding is deeply appreciated.

I accept full responsibility for any shortcomings in this book, which I hope will be useful to people in all different walks of life, especially to today's students-tomorrow's entrepreneurs.

This book is dedicated to those who during my childhood contributed to form my first knowledge cluster.

CHAPTER ONE. INDUSTRY CLUSTER

Businesses have clustered into networks of various sorts throughout history. The medieval guild system was a primitive networking exercise.

(National Commission on Entrepreneurship)

1. INTRODUCTION

There are local communities which nowadays are in better shape than they they have been in generations. Unprecedented economic development has not been inspired by government intervention, but by the simple fact that these communities have been growing organically.

Organic growth can be defined as a spontaneous, self-organised, self-sustaining and self-reinforcing formation of interconnected businesses, whose seed is a 'food' molecule (catalyser) without which the 'business reaction' would proceed only with great difficulty. High quality local resources such as skilled individuals and local-rooted entrepreneurial heroes usually act as catalysts. Success comes about almost by accident.

An industry cluster — as this phenomenon has been named — is a system centred around a core of highly specialised enterprises within the same industry enriched by close links with supporting firms which produce what the former need. Core businesses are family-controlled groups, few of which are listed in the stock market.

The idea is that companies should concentrate on a few core processes while buying in the rest from third-party suppliers under a long-term service agreement. This is the fact that features most prominently in the cluster economy.

Geographical proximity allows intense interaction, so that a large amount of information can be exchanged within and between established webs of complementary or interdependent activities that forms tight supplier-customer links through a common vision, leading to formal and informal networking. The core spawns new firms and arouses plenty of rivalry between companies. Yet co-operation and trust occur at the core. Supporting firms include banks, accountants, lawyers, designers, freight forwarders, component producers, suppliers of specialised inputs and their sub-contractors, providers of raw materials, equipment supply and servicing.

In this type of environment joint projects between specialised organisations (e.g., industry associations and insider lobbies) are common, which, in Turn, generate public-private partnerships aiming for significant support from government programmes (the Cluster Competitiveness Group, www.competitiveness.com).

Looking at companies from two distinct angles, one slots them into their posture in the marketplace, the other into their specific attitude towards clustering. The enlargement of the habitat populated by the symbiotic species makes possible more and stonger complementary links within the cluster.

The prevailing business species in a cluster community is that of the symbionts seeking connection with other similar companies. There are other species, such as the parasites who leave at the expense of other species, the predators who hunt other species, and the stable companions who do not bring a dowry with them, nor cause turbulance or interact with other species, but they are rare.

A cluster can take different but also overlapping forms. Both faculty researchers and practitioners have provided several definitions. For instance, close geographical proximity of interconnected industries such as businesses that share similar workforce, input, or infrastructural needs, gives rise to a regional cluster.

Industry clusters can be circumscribed using any combination of a broad spectrum of criteria.

Industrial districts are local clusters where spatial concentrations of micro-to-small inward looking local firms and small-to-medium companies predominate. The latter often hold an international niche leadership operating close to one another and producing similar goods. These firms are also engaged in interdependent production processes. This type is strongly represented in Italy, mainly in the North-East regions of the country where industrial districts are a striking example of an evolutionary environment from the original structure of all-equal-small firms to a set of 'wedges' with a prime company at the top.

An industrial cluster is focused on buyer-supplier relationships, common technologies and distribution channels. An innovative milieu is a cluster characterised by a process of learning and discovery driven by local businesses, academic, and public sectors working together.

The OECD-DATAR first World Congress on Local Clusters has pointed out similarities and differences characterising local clusters. The former encompass a high degree of market sensitivity, flexible means of production and proximity-based interactions between firms. The latter include economic, cultural and social assets, services, and levels of trust, latent conflicts and cut-throat competition among firms (OECD-DATAR, 2001a).

2. THE PACKAGING MACHINERY CLUSTER

Case studies of successful regions in Europe suggest that the viability of local economies relies on clusters of small and medium-sized businesses that are a major platform ('wrestling school') for flexible, adaptable and capable workforces. One of these success stories is represented by the packaging machinery cluster in and around Bologna, in the Italian region of Emilia-Romagna (Farrell, Lauridsen, 2001; Formica, 2001).

The Italian packaging machinery industry stands out internationally for its ability to meet the specialised needs of manufacturers throughout the world. At the same time it remains the main supplier for Italian manufacturers. While about 85% of production is sold abroad, the industry is still able to fulfil more than 60% of demand at national level. Italian machines cover 25% of the world export market and Italian manufacturers are particularly strong in food, tobacco and pharmaceutical machines which account for over 70% of all equipment manufactured. The Italian trade balance in the sector is structurally positive in all major areas of production, including machines for cleaning, dying, labelling, filling, packing and packaging goods, as well as for the manufacturing of the individual machine parts.

Within the sector in Italy, we find companies large enough to offer a complete range of products to all world markets

alongside smaller firms which are able to fill in specific market niches. Both large and small companies provide the market with up-to-date, state-of-the-art technology. They are able to demonstrate a special sensitivity to the market needs of the manufacturers who use their services. Systems and machines are tailor-made to fit the specific needs of their customers, using innovative techniques, new packaging materials or whatever else customers may require. That is why their agenda is full of crucial deadlines for innovation.

Innovation refers to something newly introduced, new method, custom, device, et cetera; change in the way of doing things; renew, alter.

(Webster's New World Dictionary, Second College Edition, 1982)

3. SUCCESS FACTORS

Two trends that coalesce are responsible for the success of the Bologna packaging machinery industry there are two trends which were destined to come together. On the one hand, the great tradition in precision mechanics which merged with entrepreneurial creativeness in an unique manner and paved the way for new industrial enterprises. On the other hand, the rapidly expanding demand for packaging in the market of large consumption products, and the need for adapting packaging machines to fit the particular requirements of each customer, so that even mass produced products include a 'personalised touch'. Both these elements have combined to assure quality production through careful specialisation in all facets of manufacturing. The combination of the two trends gave birth to the packaging machinary cluster. The cluster is an im-

A profound technical culture and a widespread entrepreneurial spirit from within the business community is at the foundation of the success.

pressive case of collaboration between small and medium-sized enterprises operating in continental or even global niche markets. The main industrial features that have contributed to them leading the field in this area encompass:

- Close vertical links between independent businesses, which have enhanced co-ordination as the prevalent type of interfirm collaboration.
- Adoption of state-of-the-art technology.
- Flexible production systems and methods.
- Closeness to the customers.

New trends include horizontal links between companies and a determination to work with partners for state-of-the-art research and development in a framework of co-operation and competition ('competitive co-operation' or 'co-opetition').

4. CLUSTER FORMATION AND DEVELOPMENT: THE ROLES OF ENTREPRENEURIAL HEROES' AND DIFFERENT BUSINESS SPECIES

Cluster formation and development is a self-organised, organic process for which thinkers have not yet developed ways of for making clones. That this result can be reached by cluster-based public policy is a matter in dispute, as argued in Chapter 3. However, if success cannot be assured, there is always room for a community to draw lessons and inspiration from the prosperity that other clusters have achieved.

4.1. COMMUNITY-ROOTED ENTREPRENEURIAL HEROES

The clustering process is fed and catalysed by community-rooted entrepreneurial heroes. A breakthrough in the field of

education and training in Bologna has played the role of incubator for those heroes. Indeed, this process, a long chain of events, has lasted for 150 years, linking entrepreneurial heroes with another archetype: the 'pro-business academic hero'. Thanks to the social creativity of two prominent academics, entrepreneurial heroes have materialised who have paved the way for the economic success of the cluster. This process has been driven by their personality over the pioneer period of start-up and early development.

Pro-business academics and entrepreneurial heroes are the driving forces of a self-organised, organic process of clustering.

4.2. BUSINESS SPECIES

Different business species populate the cluster economy. Yet not all the species contribute to cluster formation and development. They can be classified according to the "linkage model", which is an attempt to evaluate the market positions of different categories of firms, their links with the local environment, and the attidute to clustering (Table 1.1). The model is illustrated by a 3 x 3 matrix where the three columns are related to the motivation to be located in a specific area, and the three rows are related to the markets (both supply and destination markets) in which the companies operate.

The three columns and rows identify, respectively:

- Companies that are localised in the area just for incidental or historical reasons (Column A).
- Companies whose location is the outcome of the local availability of factors that are relevant to their business, including the closeness to their market amongst these factors (Column B).
- Companies localised because of the strategic relations they have activated in the area, such as participation to

local supply networks, availability of strategic services connections with universities, et cetera (Column C).

- Companies that operate in the local or mainly in national markets (Row 1).
- Companies engaged in global/continental but mainly captive markets (Row 2).
- Companies whose operations embrace global /continental open markets (Row 3).

Nine species of firms can be visualised: i.e., fragmented, traditional, and local leaders (Row 1); cathedrals in the desert, exploiters, attractors (Row 2); opportunity developers, local champions, pivot (Row 3). Their distinctive characters are displayed in Table 1.1.

The largest populated species usually occurs in the "fragmentation" box, followed by the grouping of firms serving local needs with local resources (they fit into the in "traditional" box of the matrix). The clustering process is triggered off by one or a minor number of companies engaged in weaving a network leveraging on the web of relationships they can access in the area. We term them "local leaders" whose founders show a profile associated with the business-hero type we are going to describe for the packaging machinery cluster formation.

Local leaders prefer to emphasise the cluster evolution whether out of their capability to attracting opportunity developers (box A3), or because they have been upgraded to the "pivot" role (box C3). This reinforces their ability to create reciprocal collaborative relationships — in this case, linking large international networks in which they are enmeshed with the home cluster. In the mechanical engineering cluster between Bologna and Modena, problem-solver suppliers (see

Table 1.1

Classification of business species and their relevance to the clustering process

3	OPPORTUNITY DEVELOPERS Firms belonging to an international network. They represent an opportunity for the cluster if it is possible to link them to the local network.	LOCAL CHAMPIONS Firms that operate in inter-national markets exploiting local factors. They represent the local champions but are not necessarily involved in creating a local innovative environment.	PIVOTS They are the connection between the large meshes of the international networks formed by firms operating in global markets and their cluster.
2	CATHEDRALS IN THE DESERT Corporations' subsidiaries/plants whose contacts are with faraway headquarters.	EXPLOITERS Firms exploiting the favourable factors of the cluster economy, but not contributing to its development.	ATTRACTORS Firms in this situation show that the local economy is strategically attractive to multinationals, which, setting in the area, could successfully contribute to the clustering process were they to play as opportunity developers.

1	FRAGMENTED Firms in this situation have family and social roots in the local economy, but they haven't the capability of contributing to cluster formation.	TRADITIONAL Firms usually serving local needs with local resources. They activity is at stake in times of change.	LOCAL LEADERS Firms leveraging on the web of relationships they can access in the local economy. They are usually engaged to weave the network.
	A	B	C

1— National/local markets; 2 — Global/continental captive markets; 3 — Global/continental markets.

A — Location due to incidental and/or historical reasons; B — Location due to the presence of favourable factors; C — Location due to the presence of network relationships.

Source: Formica, Mitra, Nicolò, 1996.

Figure 1.8) of a leading brand oriented company like Tetrapack are a striking example of the role played by "attractors" (box C2). An example of the pivot's case is demonstrated in the case of IMA's internationalisation — the local leader of the packaging machinery cluster in Bologna, which is linking its offshore relationships with the local cluster the company contributed to develop in Bologna (see par. 17 in this Chapter).

5. LOCK-IN DEPENDENCE

The cluster economy is remarkably resilient. "The speed at which labour, land and capital are reallocated is breathtaking" — say the experts. Yet success by organic growth induces lock-in or path-dependence, which is a consequence of positive feedback that confines the cluster economy within the entrenched practices of thinking and doing things (Arthur, 1989). This syndrome has been recognised by several authors. For example, according to Martin and Sunley (2002: 28), "The competitive strategies of firms in clusters, which are initially highly innovative compared to firms outside clusters, tend to converge (for example through mimetic and normative isomorphism) and to be less innovative over time because cluster firms define their field of competition as the cluster to which they belong, rather than as the wider external industry.

> *Cluster decline, albeit genteel and relative if not absolute, is a potential problem or, worse, an inherent systematic feature of cluster dynamics.*
>
> *(Martin, Sunley, 2002).*

This restricted collective perspective gives rise to competitive 'blind spots' which limit cluster firms' innovative potential, strategic positioning, and ability to anticipate and react to industry-wide shocks".

Bologna has suffered from the lock-in dependence at the time of the first Industrial Revolution when the city was at the peak of its success in developing the wool and silk textile industry for which it was renowned in Europe as was Lyon. Precepts and forms of the new scientific and technology domain, together with workforce practices that the Industrial Revolution introduced, caused a deep and prolonged recession in the Bolognese economy, influenced by a "Cargo Cult Science" of people, who had difficulty in understanding the principles of the incoming scientific age (Exhibit 1.1).

The achievements of the past change into losing values. Know-how and skill, experienced workers, specialised infrastructure, inter-firm linkages, strong political support and, in general, all the institutional, social, cultural, economic and technological factors that once made it a successful cluster, then cause lock-in dependence.

Nowadays, when the packaging machine industry is confronted with the leap from the industrial to the knowledge economy, from the production of 'atoms' in form of machines that perform "cold" or unintelligent functions to that of 'bits' associated with machines that even affect our very culture — in other words, from "making things" to "think-oriented, ideas-based businesses" — the reliance on the past success makes the cluster vulnerable to lock-in syndrome and "Cargo Cult". New heroes are heralded as essential to the mastering of a new domain. In the business-as-usual, good character actors replace the protagonists, but the shape of things to come is traced by the emergence of new leading personalities who are willing to change the fabric of traditional mental habits and conventional ideas supported by people with similar thought processes.

Exhibit 1.1

The Cargo Cult Science

"Cargo Cult Science" is the expression used by the Nobel Laureate Richard P. Feynman, the father of nanotechnology, to describe the behaviour of the South Sea Islanders after World War II:

"During the war they saw airplanes land with lots of good materials, and they want the same thing to happen now. So they have arranged to make things like runways, to make a wooden hut for a man to sit in, with two wooden pieces on his head like headphones and bars of bamboo sticking out like antennas — he is the controller — and they wait for the airplanes to land. They are doing everything right. The form is perfect. It looks exactly the way it looked before. But it does not work. No airplanes land. So I call these things Cargo Cult Science, because they follow all the apparent precepts and forms of scientific investigation, but they are missing something essential, because the planes do not land".

Source: Feynman, 1999: 208–209

It is questionable whether new heroes can emerge from a successful industry. Well regarded packaging companies have been attracting the best talents, but for new heroes this is not enough. The local community ought to demonstrate long-term commitment and willingness to create a new culture and invest in co-operative ventures. This carries far-reaching implications in the fields of research, education and training is crucial. As already happened in Bologna, a fresh educational institution such as the 'entrepreneurial university' could be the cradle of new heroes.

Long-term commitment and willingness are needed to create a new culture and invest in sharing contents.

6. THE INDUSTRIAL PIONEER

The packaging machinery industry in Bologna started with the foundation of ACMA-Anonima Costruzioni Macchine Automatiche on 31 July 1924, and has since then achieved a series of successes and major transformations in technology, research and product quality (Figure 1.1). In fact, almost all the companies in Bologna, dealing in packaging machines today, originated from that very first enterprise and from the workers and technicians trained by ACMA.

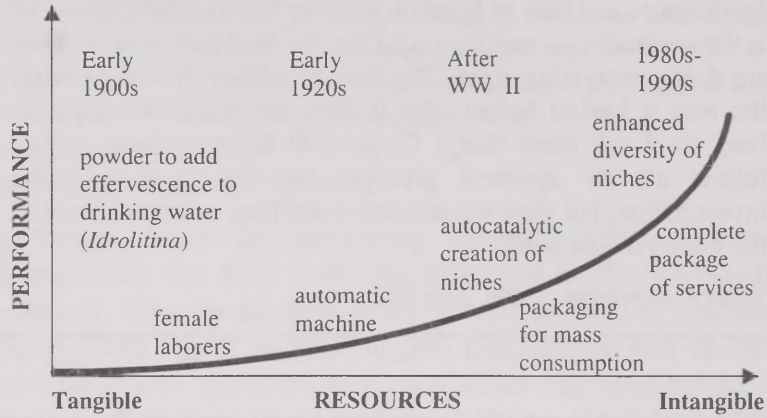


Figure 1.1. From the first packaging machine to a complete package of services.

The founder was a partner in Gazzoni, a local pharmaceutical company which, at the beginning of this century, started the production of a powder to add sparkle to drinking water. *Idrolitina*: This was its trade mark. The powder had to be measured and packaged in paper by the hands of dexterous lady workers. In the early 1920s, as a result of a growing market for *Idrolitina*, the inventor, Signor Gazzoni, asked his associate, who ran a machine shop, to build a packing machine for the automatic

packaging of table water powders. After this initial, successful experience, the ACMA machine production was enlarged to cover a wide range of chemical, pharmaceutical, confectionary and food products. In the early 1930s the company began to to diversify into European and other foreign markets.

The industrial pioneer builds the entrepreneurial spirit into the local community. Blue collar workers and technicians working in "mother firms" like ACMA started up their own companies.

Six firms between 1937 and 1946, and 38 between 1950 and 1991 were spin-offs from ACMA. Their founders — artisans and technicians of the mother company — opened new market segments in producing automatic machinery and a range of other products. As Farrell and Lauridsen (2001) have observed, "First, burgeoning cross-sectoral demand for packaging machines meant that there was a wide variety of market niches, and room for many producers, and technicians could strike out on their own without succumbing to competition from their parent firm or other firms. Second, despite this variety, the mechanical skills needed to produce packaging machines for one market segment usually transferred with relative ease to another".

Today, in this industry in Bologna are a myriad of companies engaged in designing, making the machine parts (nuts, bolts, studnuts, washers, and many others), and assembly automatic machines for a wide range of industries, such as foodstuffs, bakery, confectionery, beverage, tea, tobacco, pharmaceutical, chemical. Several of them are internationally renowned, and some (GD, SASIB, IMA) are world leaders supported by chains of suppliers and subcontractors who deliver promptly in order to make the machine parts.

7. AN EXAMPLE OF THE AUTOCATALYTIC SYSTEM

ACMA was the 'food' molecule without which the 'industrial reaction' would only have taken place with a great difficulty. The ACMA machines were conceptualised in the heart of the factory — the engineering department — directed by Bruto Carpigiani, the 'father' of automatic machine designers from 1927 to 1945. He had acquired the mechanical knowledge disseminated through a local, commune-funded, technical school, *Aldini-Valeriani*, founded in the mid-1880s. Indeed, most of the spin-ees from the ACMA had been former students of the *Aldini-Valeriani*. In the early days of the industrial revolution two *Bolognesi* — Giovanni Aldini, a scientist, and Luigi Valeriani, an economist, visited the new technical and professional schools in France, Great Britain, Germany and Belgium, learning the best practice of the new technical education and training on offer in Europe. The fruit of their travel was first the gestation and then the foundation of a technical school. A self-sustained trend of new firm formation was the outcome of a cross-fertilisation process between in-company learning by doing training and formal training at the technical school for new mechanical qualifications. Therefore, ACMA had been catalysed, in turn, by the *Aldini-Valeriani* School, in turn, has been the incubator of the catalytic process initiated by ACMA (Exhibit 1.2).

Exhibit 1.2

Aldini-Valeriani: How an innovative technical school has been fostering a clustering process

Aldini-Valeriani's long term life cycle has allowed the foundation and diffusion of mechanical knowledge and entrepreneurial culture in the local community. Its major achievements are:

- Incubation of entrepreneurship, particularly in the sector of packaging automatic machines for which Bologna region is a worldwide leader. A self sustained mode of new firm formation has been the outcome of a cross-fertilisation process between in-company 'learning by doing' training and formal training at the technical school for new mechanical qualifications.
- High levels of working class professionalism and social mobility.
- By means of education and training, contribution to the formation of a mesh of artisan subcontractors who deliver promptly to make the machine parts.

Gestation (1794–1844)

- Learning the best practices of the new technical education and training in Europe. A scientist, Giovanni Aldini, and an economist, Luigi Valeriani, visit the new technical and professional schools emerging from the industrial revolution in France, Great Britain, Germany and Belgium.
- Regeneration of the preindustrial revolution experience in promoting the link between knowledge and work as an essential condition of development in the wool and silk textile manufacturing for which Bologna was at that time renowned in Europe.
- Strong commitment of the local Public Administration.

Take off (1844–1860)

- Opening of the Bologna Technical Schools attended by the city's craftsmen.

Exhibit 1.2 continued

Early development (1860–1877)

- Experimental phase of the Valeriani School of Applied Design of Industrial Arts.

Second development (1878–1930)

- Establishment of the Aldini-Valeriani Institute for Arts and Trades, attended by young apprentices, teaching manual work done in the school workshops.

Growth (1930–1965)

- Transformation of the Institute into the Aldini-Valeriani Industrial Technical Institute that updates technology and teaching methods to train intermediate level technicians.

Maturity and decline (1965–1995)

- Due to the weakness to cope with the needs of the local firms for the innovative devices in the fields of mechatronics and information technologies, the Institute suffers for a relaxation of its industrial ties.
- Work practice resulting from new industrial relations within the Institute discourage collaboration with industry.
- The Institute becomes less attractive to young students.
- The Institute suffers also from a lack of a vision by the local City Council whose commitment slowly fades away.
- Several plans for a full recovery do not lead to the regeneration of the original entrepreneurial spirit.

A collectively autocatalytic system is defined as "one in which the molecules speed up the very reactions by which they themselves are formed: A makes B; B makes C; C makes again. Given a supply of food molecules, the network will be able to constantly re-create itself" (Kauffmann, 1995). In Figure 1.2 the formation of the autocatalytic system of the Bologna packaging machinery industry is highlighted.

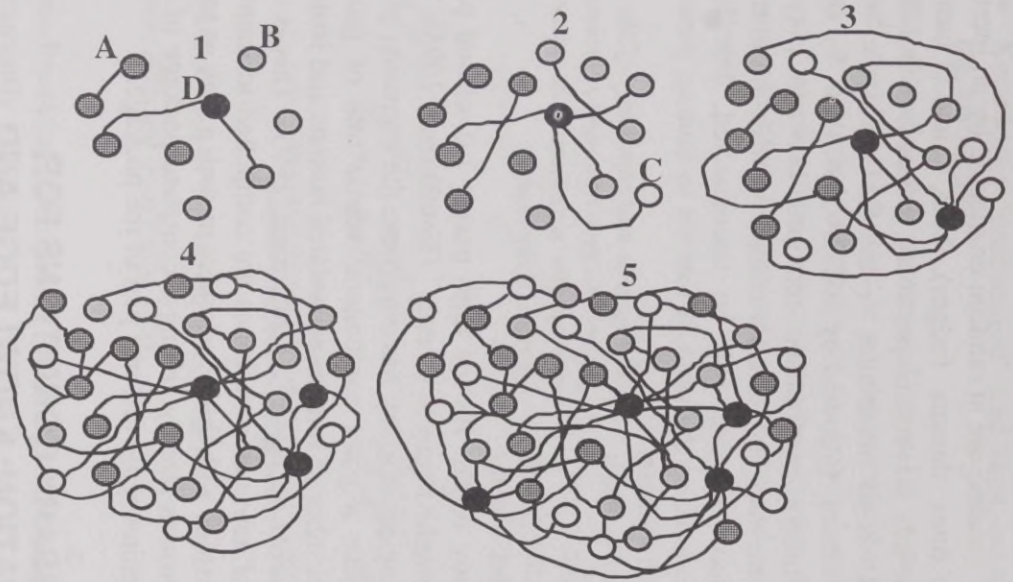


Figure 1.2. Formation of the autocatalytic system.
A ○ — artisans; B ○ — technicians; C (white) — companies; D (black) — food molecules.

Dots 'buttons' (nodes) are at random connected by an increasing number of lines 'threads' (edges). A, B, C and D buttons symbolised the key players: respectively, artisans, technicians, companies and 'food' molecules — the first molecule being the technical school, followed by ACMA and, then, by other companies. Threads symbolised relations between players. "When there are very few threads compared with the number of buttons, most buttons will be unconnected. For large numbers of buttons, as the ratio of threads to buttons passes a threshold of 0.5 a phase transition occurs; most points become connected in one giant component, and a giant cluster suddenly forms. As the ratio passes 1.0, closed pathways of all lengths begin to emerge" (Kauffmann, 1995). The Bologna packaging industry has overcome the transition phase and is now like a giant component, whose"rate of growth slows as the number of remaining isolated buttons and isolated small components decreases" (Kauffmann, 1995). This is why the builders of automatic machines are compelled to innovate in the relationships with their customers in such a way as to accelerate the growth rate by selling a complete package of services, the machine being just one part of the package.

Willingness and capability of the key players to generate new relations in the system determine the pace of growth of the cluster.

8. NECESSARY CONDITIONS FOR INNOVATION: KNOWLEDGE AND EDUCATION

Knowledge is the fuel for innovation. Namely:

- Knowledge converted or embedded into processes, goods, and services.
- Different sources of knowledge joined together to increase the value of a product or service.

- Knowledge 'productized' and then commercialised in the marketplace.

Today's challenge is shown in Figure 1.3 in which three hills of self-organised knowledge are displayed. The first hill represents the knowledge domain of the pre-Industrial Revolution age. During that time Bologna reached the top of the hill (P1) through relentless innovation in the wool and silk manufacturing system.

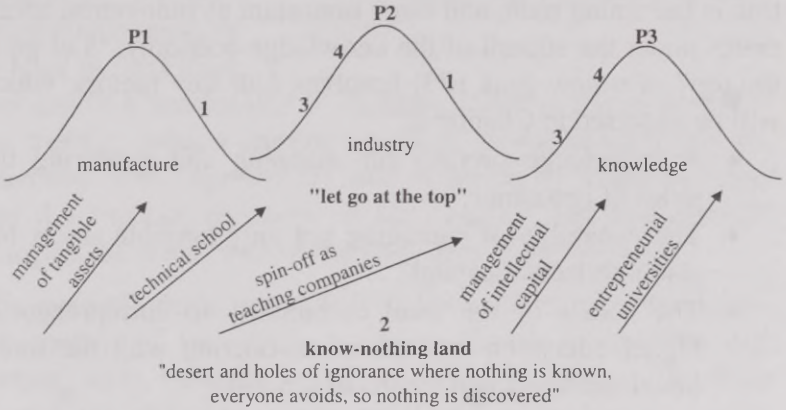


Figure 1.3. Hills of self-organised knowledge.

Source: Adapted from Kelly, 1994.

Groundbreaking innovations in mechanical engineering that permanently change the market conditions lead to the decline (point 1 at the left side of Figure 1.3) of the Bolognese manufacturing system. Crossing the area of (point 2) ignorance in order to savour the benefits of the incoming Industrial Revolution

Innovation means parting with the conventional wisdom.

(Isao Nakauchi, leading entrepreneur in the retail industry)

was a long and painful run, ending with the conquest of a new peak (P2), again — that of the industrial age. This was the ability to combine theoretical knowledge with manual practice at the innovative organisation for technical education — the *Aldini-Valeriani* Institute — and of an impressive, widespread learning of how tangible assets ought to be handled — thanks to a range of spin-offs (mostly from ACMA) acting as teaching companies.

Today the acquisition of new theories and modes of organisation is becoming more and more important as innovation accelerates under the stimuli of the knowledge economy. "Let go at the top" of a new peak (P3) involves four key factors, which will be analysed in Chapter 2:

- A knowledge process for mapping and exploring the holes of ignorance.
- The capability of managing not only tangible assets but also intellectual capital.
- The access of the local community to entrepreneurial higher education institutions co-opeting with the traditional academia and technical schools.
- An increasing number of knowledge-based startups from the research and learning environment — the very engine of firm creation in the digital era as the shopfloor was in the industrial one.

9. CLUSTER MUTATION

Not only breakthrough innovations but also changes in shoppers' tastes can affect a cluster community with a long tradition of manufacturing. This is the case of the straw hat cluster in Carpi, a small industrial town near Modena in the Emilia-Romagna region. The area was made famous by women skilled in staw-weaving on to which a modern entrepreneurial spirit was grafted during the 19th century. When, by the end of that century, the straw hat ("paglietta") turned into a smart

accessory for men, Carpi pioneering entrepreneurs marketed the new fashion in Europe and the USA. But the straw hat fashion faded after the First world war, causing a structural crisis from which the local economy emerged at the end of the Second world war when a second generation of pioneers discovered that the same technique of straw-shaving could have been applied to knitted work. This was the beginning of a widespread and self-sustaining process of technology transfer which engendered, as far back as the Fifties, a swarm of home located workshops. In those micro-laboratories women, using a knitting machine, produced knitwears for merchants who supplied the raw materials to workshops and sold the finished products on the "piazza" (marketplace) of Bologna, the main town of the local area, at weekends.

As clusters are getting more successful, they are getting speed wobbles.

This example demonstates that SMEs endorse business-sensitive models of technology transfer. Market motivations that nurture new business ideas encourage creative imitation through the ability to combine different technologies — what has been dubbed a "technology fusion" process of technology transfer (Kodama, 1992). The reward is a large diffusion of the meaning of a technology, which nurtures both new ideas and their successful applications on the marketplace. Its application in a creative way beyond the current use is the outcome of the transmission of informal,

The ability to combine and transfer technology is as important as the original discovery of a technology.

(William E. Coyne, former Senior Vice President, Research and Development, 3M – Coyne, 1996)

tacit knowledge[1] disseminated through face-to-face verbal, uncodified communication, particularly moulded in the cluster community.

As a result of this evolutionary change, today's knitwear and clothing cluster in Carpi accounts for more than 1 500 micro firms engaged in goods-in-process for third parties. Both the phase-firms and the leading primes, which are focused on designing and delivering the finished products, are small in size. Indeed, throughout the 1990s the average size firm has been generating a turnover of 5.5m euro with 5–6 employees. Overall, 700 enterprises with less than 50 employees account of 70% of the cluster turnover. In terms of comparison, Benetton's size is comparable to Carpi's, whereas the rival cluster of Vicenza, in the Veneto region, consists of 20 medium to large companies with an average of 200 employees in each.

10. THE LIFE CYCLE OF LEADERSHIP

There is frequently a conflict in the cluster community between the old guard management with its tyranny of seniority and the informality and openness of would-be heroes and drivers of change who steer the chaos (Figure 1.4).

The leadership of the past pioneers and early followers, those who created myths and symbols of the packaging cluster, still remains and influences their business community, even if demography has contributed to erode the 'tyranny of seniority'.

[1] Tacit versus explicit knowledge and the difference between knowledge and information are expounded in Chapter 2, par 2.

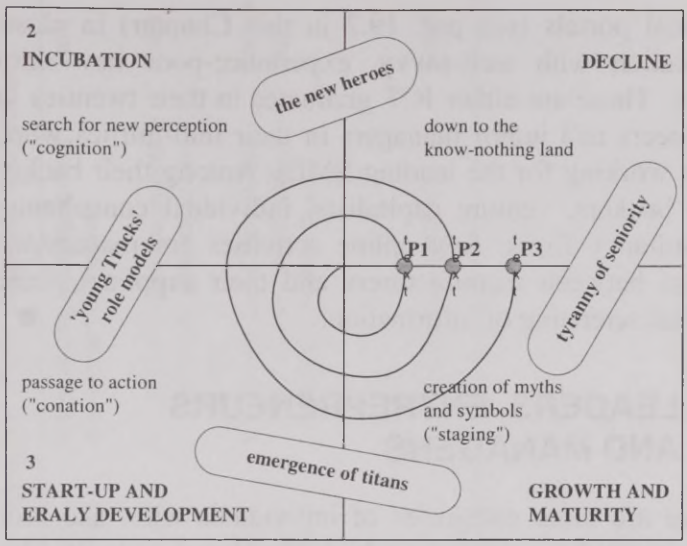


Figure 1.4. Between chaos of heroes and tyranny of seniority.

As for the new heroes, there is a limited understanding of their presence. Some 'young Turks', the last generation of the founders' families, are searching for a new perception, tapping creativeness and benefiting from diversification inside the industry, or have moved on to new pastures — for instance, launching interactive multimedia software for presentation of automatic machines, parts of them and industrial lay-outs, for interactive teaching courses, interactive manuals of instruction and spare parts' catalogues. Others have attempted to carve out a niche for themselves in the Internet economy. They have set up

> *The cluster's path of destiny is traced by the life cycle and features of its leaders.*
>
> *Clear, visible and shared leadership within a loose hierarchy allows the sharing of ideas throughout organisation and encourages innovation.*
>
> *(Stanford, 2002)*

vertical portals (see par. 19.2 in this Chapter) in close collaboration with tech-savvy, experience-poor new entrepreneurs. These are either ICT graduates in their twenties and/or engineers and junior managers in their mid-thirties who have been working for the leading SMEs. Among their backers are also bankers, venture capitalists, individual consultants, and consultancy firms. Key online activities are management of orders between manufacturers and their suppliers, searching for and screening of information.

11. LEADERS, ENTREPRENEURS AND MANAGERS

There are three categories of individuals who take initiative and create the context on which the cluster is built. The first category includes the 'catalysts', who instigate the cluster formation and renewal. They shape an environment of collaborative behaviour and challenge the cluster's status quo and success factors. These individuals are acknowledged as the industry leaders whose life cycle has been featured above. Today's tyrants and titans are those leaders who have been building a context of business collaboration and creating a spirit of common purposes and ambitions. While the new heroes are those who typically provide today's new visions whereby the 'young Turks' leaders undertake the consequent actions for the cluster's renovation. The leaders' tasks and their attributes — i.e., personal traits, knowledge and specialised skills — are listed in Table 1.2.

The second category features the 'doers', who build on the cluster's foundations established by the industry leaders. Their profile is similar to that of the entrepreneurs who have not had the chance to gain a foothold on the industry-leaders ladder. They are either owners of family companies or empowered

Table 1.2

Leaders, entrepreneurs and managers in the cluster community: Their tasks and attributes

	Linking dispersed resources and skills	**Reconciling short-term and long-term commitments and pressures**	**Encouraging and supporting extroverted initiatives**	**Task**
	• Cluster-team builder	• Ability to fine tune	• Ability to pass responsibility on to subordinates, to empower	Skills
Managers	• Knowledge of community of practices, understanding of interpersonal dynamics both in company and cluster	• Understanding short-term priorities as the means and long-term goals as the ends	• Knowledge of the individuals' quality, understanding how to influence them	Knowledge
	• Attitude to integration and flexibility	• Acuteness	• Be a coach, a supporter	Traits

	Attracting new skills and resources	**Continuous performance improvement**	**Creating and pursuing opportunities beyond the clusters horizon**	**Task**
Entrepreneurs	• Ability to motivate and drive people	• Ability to take care of demanding targets	• Ability to grasp the new potential	Skills
	• Knowledge of skills and resources in and out of the cluster	• Knowledge of the clusters business	• Knowledge of the changing times	Knowledge
	• Attitude to attract and engage	• Spirit of competitiveness	• Creative, intuitive, eager to challenge the unknown	Traits
	Building a context of strong trusting relationships	**Creating in the cluster a spirit of common purposes and ambitions**	**Challenging the embedded success factors by a new vision**	**Task**
Leaders	• Inspiring confidence and creating beliefs	• Ability to communicate	• Questioning and demanding	Skills
	• Knowledge of the clusters culture, structures, processes	• Broad knowledge of all players in the cluster	• Understanding of how doing new things in new ways	Knowledge
	• Fairness	• Insightful	• Visionary-minded	Traits

managers and employees who are responsible for the company's entrepreneurial initiatives ('intrepreneurs' — as they have been termed). Entrepreneurs constitute the glue or the 'jam in a sadwich' between leaders and operational managers. Their major tasks involve attracting of new skills and resources for supporting trust-based inter-firm relationships, endeavoring to achieve continuous performance improvement needed to nurture the spirit of common ends and aspirations in the cluster, and the creation and pursuit of opportunities in accordance with the new ideas the leaders have envisioned. The tasks, traits, knowledge and skills characterising the entrepreneurs' category are listed in Table 1.2.

The third category are the 'developers', who transform the ideas of the leaders into concrete proposals, which the entrepreneurs then convert into reality. The developers' profile is similar to the operational managers, who link resources and skills attracted by the entrepreneurs, develop the initiative for the opportunities which the entrepreneurs have opened up, and align short- and long-term commitments on the basis of the entrepreneurs' performance metrics. Tasks and attributes in this category are outlined in Table 1.2.

To understand how the three categories of individuals here described come into existence, it is essential to grasp the business model that characterises the communities where the cluster configuration has the greatest chance to take root and succeed. As has been previously pointed out, in those communities most of the companies are family businesses in which the essential resource is the personality and knowledge of everyone who is involved in them, from the entrepreneur and his managers down to the foreman and shoopfloor workers. The versatile organisation of this type of company does not stifle individual creativity and initiative, while in the old-style big business a rigid and authoritarian structure tended to repress the talents of people and did not encouraged them to take risks and challenge

the status quo. So, to galvanise the cluster process, in which the critical mass of grouping makes the difference, is the 'individualised' company — that is, the organisation that exalts the individual. It is worth noting that it is only in the late 1990s that humble and unknown business, that for too long time had been the 'individualised' company, embedded in a cluster environment, became the model for companies in a wide range of industries which aspired to become successful global players (Ghoshal, Barlett, 1998).

12. SOCIAL CAPITAL

Social capital, along with human capital, knowledge, physical capital and infrastructures, are a key factor of the cluster formation and development. An international survey carried out by experts has identified social capital among the top three ranking attributes of a successful cluster (Table 1.3).

Social capital is embodied in the relations among people. It refers to a learning process of sharing norms, values, meaning and expertise, goals and aspirations, decision-making, work, risk, et cetera that propitiates relationships for collective actions with mutual benefit.

(Coleman, 1990: 304; Stanford, 2002).

Table 1.3

Top three ranking attributes of a successful cluster

Technology and knowledge formation
Pools of specialised skills and technology that provide quality inputs into production systems.
Strong commitment to, and investment in knowledge formation, that underscores a robust and integrated regional innovation system.
Networks of dynamic SMEs that can drive local innovation.

Civic entrepreneurs*
They champion issues, and are able to produce outcomes through their credibility and networks.
They leverage off the social capital within the region/industry and bring others into the agenda.
Social capital
A sense of shared vision and destiny.
Common values that facilitate collaboration and wealth creation.
A 'sense of community' and progressiveness that attracts the interest of external stakeholders.

* They resemble the community-rooted business heroes as described above (par. 3).

Source: The Clustering Alliance Newsletter, July 2002, No 31.

Yet the concept of social capital must be handled with care so as not to encourage a form of protectionism among those who are involved in forging links among them, since this may lead to the exclusion of people outside their own community. By restricting the area of collaboration between insiders and outsiders, protectionism damages both parties. The outsiders cannot benefit from the wealth that social capital has contributed to generating in that community. On the other hand, the insiders isolate themselves from new visions that the outsiders could contribute. In view of the above — as observed by Fuller (2002) — "social capital is an example of what the economist Fred Hirsch originally called a 'positional good', that is, a good whose value is principally tied to the exclusion of specific consumers". Fuller has also observed that there is a source of corruption in "the intimate linking of social and economic interests so valorised by social capital thinking".

Traditional and spontaneous sociability are primary components of the social capital. Traditional sociability "can be said to be loyalty to long-established social groups, [as in the case

of] the medieval producers", such as the Guilds of the Hanseatic League. Conversely, spontaneous sociability, "is the ability to come working together and cohere in new groups for common purposes, and to thrive in innovative organisational settings" (Fukuyama, 1995).

Social capital breaks down in traditional and spontaneous sociability.

Which type of sociability will prevail in a given community, is due to the predominant set of values and beliefs, unwritten norms and conventions which are shared amongs individuals of that community in their everyday interactions. If traditional sociability is to be the outcome, then the common trait of that community would be kinship and family ties where people trust solely close relatives. In communities which live in a social climate of familist behaviour, firms mistrust one another, and then the entrepreneurial energy generated by the founding fathers tends to be dissipated and degenerate into a syndrome of the 'third generation' once the baton has passed from the founders to their descendants (Figure 1.5).

Spontaneous sociability is associated with strong trusting relationships that extend well beyond the family ties. Trust reduces the costs of monitoring contracts and allows risks and information to be shared. People disseminate knowledge and valuable information between firms as they use to do within them. When the succcess of the partnership is at the top of the agenda, no one will seek ways to take advantage of the others, and therefore put aside self interest be if for himself or for the family members (Uzzi, 1997).

Trust comes out from a personal feeling. It is a distinguishing characteristic of a relationship.

Trust is a social dividend that springs from the individual need to preserve his own reputation within the community.

(Kay, 1995)

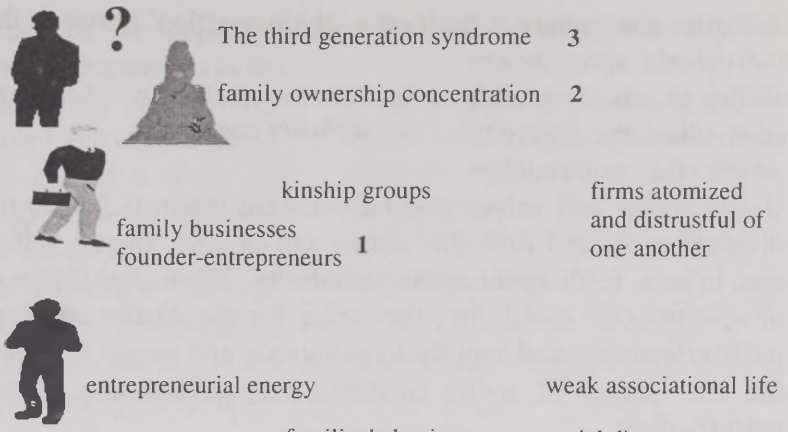


Figure 1.5. Familist behaviour and family-held company evolution.

1 — Founding fathers have been mainly blue collars and technicians, unorthodox and independent-minded individuals in quickly changing times.

2 — The original entrepreneurial spirit turns into a bureaucracy with successors who, as recipients of university diplomas, expect to play executive roles in their family company.

3 — Inheritors are not as tied to continued ownership as their parents or grandparents.

Clusters are relatively high-trust communities in which non-kinship relationships predominate and don't rot in interest groups[2] that support restrictive practises and cartelised groups.

[2] Interest groups are coalitions of interests organised around economic, social, political factors. They tend to accrue benefits for themselves and only then they consider the interests of their members. Prestige as well as the capability to initiate actions that can damage other competing interest groups or the community as a whole determine the strength of each group.

A cluster community is built on a 'chain reaction' between the individuals' spontaneous ability to associate with each other, the degree to which the community shares norms and values placing common interests before individual ones, and trust that comes out of such shared values and, in turn, feeds spontaneous sociability. The higher the level of spontaneous sociability, the easier for the cluster to adapt itself effectively and rapidly to economic and social changes. So, the quality of social capital deeply affects the cluster performance.

Spontaneous sociability characterises a cluster community.

Social capital and its involvement of trust is a key factor underpinning innovation and increased productivity, as has been shown by a positive correlation between the innovation index and the trust index produced, respectively, by the European Commission's DG Enterprise and the OECD (Rousseau, 2002).

The accumulation of social capital gives force to the proposition that the path to prosperity is an ambition that could be attained by practically anyone. A shared prosperity rather than a widening inequality is the striking feature of the cluster community.

13. BUSINESS COLLABORATION: THE CO-ORDINATION MODE

The pursuit of trust is the outcome of the practice of apprenticeship for collaboration at all levels. Business collaboration is an enduring process of learning how to manage inter-firm relationships. Trust and social capital are the 'genes' that dictate the evolution of so complex an adaptive web as business collaboration.

Practices of apprenticeship for collaboration are popular among companies in the packaging cluster. All have been experiencing the primitive form of collaboration, defined as 'co-ordination' Some are adopting a fresh approach in 'co-operating while the avant-garde is practising the very sophisticated 'co-opetition' game (Figure 1.6).

> *... the quality and quantity of meaningful collaboration often depends upon the tools used to create it... Collaboration is like romance... it can't be routine and predictable.*
>
> *(Schrange, 1990)*

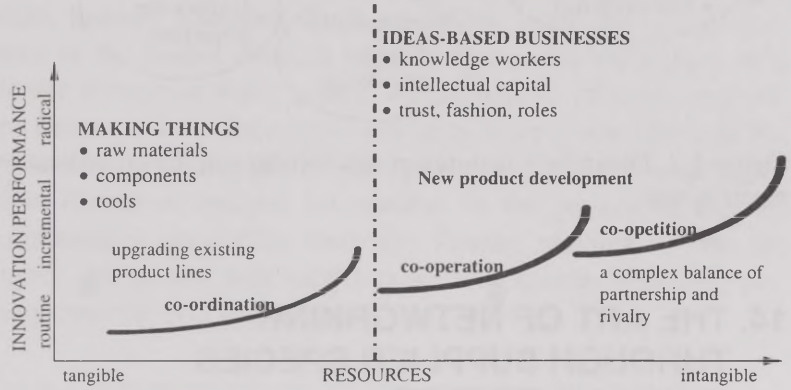


Figure 1.6. Forms of business collaboration in an evolving cluster.

From co-ordination, companies learn to enhance the process of "simultaneous adoption of identical or complementary strategies by independent agents" (Kay, 1995), whose relationships mainly of a commercial supply- type are informal and implicit, based on unwritten rules and unwritten codes of conduct. Building co-ordination on strings of tangible resources (i.e., raw materials, tools, components, and intermediate products) imbued with tacit knowledge, vertically disintegrated supply chains have been growing in the packaging cluster. Distinctive

features of the relationships prevailing in the co-ordination environment are condensed in Figure 1.7.

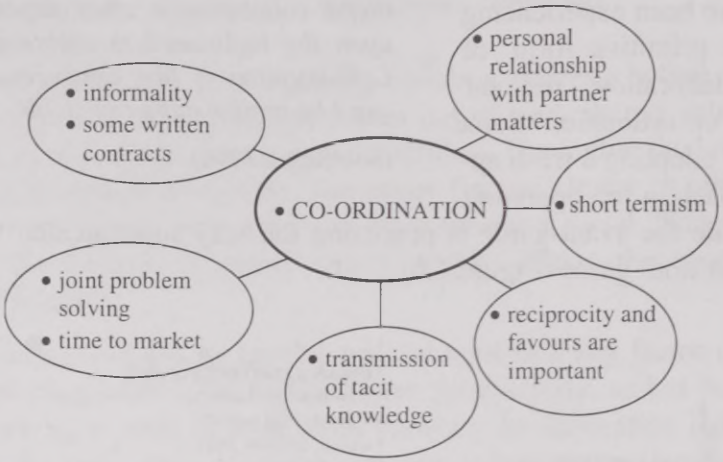


Figure 1.7. Distinctive features of relationships in the co-ordination environment.

14. THE ART OF NETWORKING THROUGH SUPPLIER SPECIES

Mass production is characterised by vertically integrated supply chains with many remote, external commodity suppliers (i.e., spot-market/ off-the-shelf suppliers), and many internal links between 'quasi' firms which are operational units inside the vertically integrated leading company that interact with each other through a sort of open market price mechanism. Conversely, the flexible production mode which

In the cluster economy, specialised partners are in a close relationship with the industry leaders, and each of them operates at a specific segment of the supply chain.

distinguishes the cluster economy tips the balance of power towards vertically disintegrated supply chains where the industry leaders manage close relationships with collaborative specialists (i.e., detail-controlled parts suppliers) and problem solvers (i.e., suppliers concentrated on early design and with an independent market mission). The leading company shows fewer in-home links because an external network — where different types of suppliers, which encompass also the 'quasi' firms changed into spin-off companies, coalesce with the leader — replaces the internal network.

By sharing functions such as order taking and shipping, cluster companies embedded in supply chains derive economies of scale, thereby lowering chain members' costs. Historical patterns in the Italian districts suggest that in the early days of a cluster formation these chains were made up of small and micro firms, each of them specialising in merely one phase of the cycle — resembling the Roman phalanx, a body of soldiers in close formation arrayed for combat. In the packaging cluster, collaborative specialists form the Roman phalanx. These are highly skilled low tech suppliers in close liaison with their primary customers (Figure 1.8).

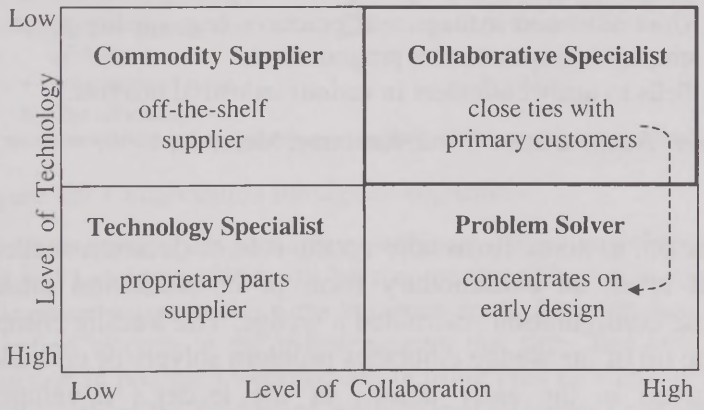


Figure 1.8. Supplier species.

COMMODITY SUPPLIER

- Spot-market supplier.
- Low cost/low price priorities.
- Little or no differentiation.
- Captive or independent market mission.

COLLABORATIVE SPECIALIST

- Detail-controlled parts made under specifications of the industry leaders.
- Cyclical, quasi dependent market mission.
- Member of a closed network in each industry with few customers in each.

TECHNOLOGY SPECIALIST

- Innovation in product technology used to produce high barriers to entry.
- First mover advantages.
- Uses design capability for competitive advantage.
- Does not work closely with customers.
- Counter cyclical quasi independent market mission.

PROBLEM SOLVER

- Independent market mission.
- Differentiation strategy.
- Competes primarily on his ability to solve process and product problems for his industry clients.
- Uses advanced management practices (e.g. quality practices, employee empowerment programmes).
- Sells to many customers in various industrial markets.

Source: Adapted from Wood, Kaufman, Merenda, 1996.

Later on, as some firms take up the role of decision-makers at local level, an evolutionary form of co-ordination emerges whose configuration resembled a wedge. The leading company at the tip of the wedge embraces problem solvers or co-makers, involved in the early phases of the leader's development process (Figure 1.8). Secondary and tertiary subcontractors

underpinning the new business configuration emerge. In this situation, historically rooted in the architecture of co-ordination, a grey area appears in the cluster, where opportunistic actions and propensity to conduct business through binding commitments co-exist side by side (Figure 1.9).

Leading firms are those who retain control of design, marketing and sales and the strategic phase of assembling the final product executed in collaboration with the co-makers.

Subcontractors are small artisan firms that produce pieces to specification, taking part in one or few phases of the production process.

Figure 1.9. Collaboration through co-ordination.

(*) In the case of the packaging machinery cluster in Bologna, Farrell and Lauridsen (2001: 20) have noted that "There was considerable opportunism among firms in certain areas. A severe shortage of qualified workers in the industry meant that firms had little compunction in poaching workers, and in using their new employees to find out about the production *methods and techniques used in their former workplaces* (emphasis added). Indeed, there was a more gen-

eral phenomenon of diffusion of technical information through copying of designs; while this may have had some positive effects for the district overall, it also discouraged major investments in research that could not be protected by patent".

Those, who attempt to co-ordinate their business activities and seek to do so over the long term, frequently discover that their activities are jeopardised by their parties' opportunistic behaviour. Implicit commitment of long-term links induces the parties to invest in the relationship. Yet, once investment has been made, the major company in the partnership may sometimes attempt to exploit the weaker parties. This situation can lead to the termination of the business relationship. Sharing the gains of the relationship with the stronger organisation only in part counterbalances the risk of the termination for the weaker parties.

It is generally the case that parties in co-ordination tend to act as shortermist firms, which sacrifice future market gains for short-term profits, disregarding the general interest. A 'hit-and-run' conduct for which "a larger slice is better than a larger cake" (Kay, 1995) erodes trust as a social dividend.

Parties in co-ordination tend to act as shorter mist firms.

15. THE CO-OPERATION MODE

Co-ordination is suitable in the case where there are steady sets of products matching with routine and incremental innovations. Supply chains are the entrepreneurial version of vertically integrated companies without the inconveniences of bureaucracy which common ownership encourages. But things totally change as new product development rather than upgrading the existing product lines becomes the key factor for suc-

cess. At this stage the primary customers carefully select their collaborative specialists, who were accustomed to operate as detail-controlled parts suppliers under a market mission dictated by their customers. The latter carefully look carefully for suppliers capable of solving their process and production problems. These problem solvers are drawn into the design and development of new products and components at a very early stage and are often integrated into the customer's organisation. The two parties conduct research and development together, and in so doing share a common vision and goal.

Industry leaders stand out in terms of strategic capability and strength of personality.

By contractual solutions for long-term relationships, the leaders form stable networks with their problem solvers. The latter are independent firms, which develop distinctive competencies and serve ever other companies outside the network.

Both customers and suppliers are subject to the 'five year' and '20%' rules. The first states that "customers share proprietary product designs with suppliers as much as five years in advance in order to ensure access to state-of-the-art components". The second one states that, "firms prevent their business from accounting for more than 20% of a supplier's revenues and prefer that no customer accounts for more that 20% of their own revenues either" (Saxenian, 1993).

Lessons drawn from co-ordination and related supply chains induce the most innovative companies to invest in 'untraded' or non-commercial factors of interdependency, such as educational attainment, developing team works as multidisciplinary communities of practice, commu-

Co-operation allows the parties to maximise the joint product of their relationships rather than the individual returns.

nicating and promoting favourable attitudes towards industry (Storper, 1995). From this investment the expectation is that an increasing number of firms would plan actions for maximising the joint product of their relationships rather than the individual returns. This is the 'co-operation' mode that fosters a sense of community whereby the invisible hand of the market is accompanied by an invisible handshake. All through the cluster evolution an increasing number of companies show a will to co-operate, for which their budgets are directed to investment in strings of intangible resources (knowledge workers, software, trust, fashions, roles). This gives birth to advanced workplace and management practices by which networks of firms and network-firms replace the old-style supply chains. The network code is outlined in Table 1.4.

Table 1.4

Network code

Voluntarism — Partners are free to withdraw from relationships they believe are unfairly structured.
Openness — Network relationships are external and thus highly visible to all parties.
Explicitness — External, visible relationships tend to be explicit.
Simpleness — The less you sign, the more you achieve.
Performanceness — Network relationships are guided by performance rather than by procedures.
Accessibility — Full-disclosure information systems assure that all decisions are made objectively and fairly.
Self-renewal — Many autonomous, intelligent work units interacting rapidly with the outside world and each other, and quickly rearranging themselves to solve new problems.

Source: Adapted from Miles, Snow, 1992.

16. THE CO-OPETITION MODE

The co-operative pattern embodies a good deal of competition within (not only outside) the relationship for both the generation and the distribution of the net gain of the non-zero-sum game.

Co-opetition is to compete and co-operate with the same companies.

This results in a variety of situations of competitive co-operation or co-opetition across parties.

As Nalebuff and Brandenburger explain: "Business is co-operation when it comes to creating a pie and competition when it comes to dividing it up. In other words, business is War and Peace. But it's not Tolstoy — endless cycles of war followed by peace followed by war. It's simultaneously war and peace... You have to compete and co-operate at the same time. The combination [that is, co-opetition] makes for a more dynamic relationship than the words competition and co-operation suggest individually. [In the co-opetition game] your success doesn't require others to fail — there can be multiple winners" (Nalebuff, Brandenburger, 1996: 4–5).

Co-operation and competition are mixed together in various ways. Varying blends of competing and co-operating — state Hampden-Turner and Trompenaars (1997) — correspond to different co-opetition games. The two authors call "finite games" those situations in which co-operative competing is an attitude that leans toward competitiveness.

In Finite Games you compete, the better to cooperate. In Infinite Games you cooperate better to compete.

(Hampden-Turner, Trompenaars, 1997: 25)

Conversely, endless or "infinite"are those games that incline toward cooperativeness. Distinct traits of the two kinds of games are shown in Figure 1.10.

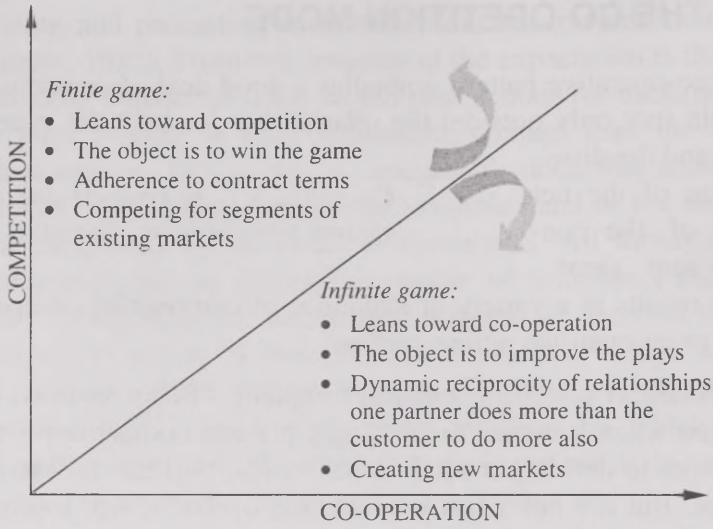


Figure 1.10. Competition and co-operation: finite and infinite games.

Source: Adapted from Hampden-Turner, Trompenaars, 1997.

The main characteristcs of companies in co-opetition are access to external business partners, constant reconfiguration of business relationships, and a dramatic increase in outsourcing. Companies "behave like the Internet, where everyone can participate and the total effort is greater than the sum of the parts" (Tapscott, 1995).

Throughout the 1990s the co-opetition mode has been evolving through the "dynamics of the world economy [that] are forcing companies to cooperate in order to compete". This results in competitive alliances that are "ventures between strong international companies that generally remain competitors outside the relationship" (Cauley de la Sierra, 1995).

Competition forces companies to co-operate.

On the other hand, in order to overcome the risk of a 'Byzantine' bureaucracy (that is, a non-co-operative attitude replacing the co-operative behaviour inside the firm), competition spurs companies to compete within them, so as to foment an 'intra-corporate market'. This gives rise to 'quasi-firms', some of them emerging as independent companies linked to the mother-company by means of competitive co-operation relationships.

Both these views, however, confine co-opetition to big business. Besides, co-opetition is perceived as a two-tier game: before, 'domestic' (inside the relationship) co-operation across the parties and after 'foreign' (in the open market, outside the relationship) competition between them. What is left out is the intrinsic nature of this relationship, which is the unification and not the division between co-operation and competition. This is equivalent to saying that competitive co-operation fits the principle of multivalence or fuzziness instead of that of bivalence or two-valuedness (Kosko, 1994). It means a large spectrum of competition and co-operation options, of which those mentioned above are only the two borderline cases. So, for example, to some degree the area of co-operation might be related to the 'untraded' factors of the interdependency, for which collaborative actions are developed by autonomous (ownership-independent) inter-company teams, whereas to some degree the 'traded' factors might provoke competition across parties inside long before than outside the relationship. In short, competitive co-operation is an overlapping world made up of competing and co-operating firms whose borderlines are 'domestic' co-operation and 'foreign' competition.

As far as SMEs are concerned, IC leading companies, their problem solvers and collaborative specialists, already bonded together for a common purpose, show a greater openness in communication with each other, whereby the self-contained cluster develops an outward-looking perspective. In fact, it cannot be sufficiently emphasised, in the co-operation mode

companies accept that whenever there is a trade-off between short-term profits and investment for breeding the network competitiveness, the latter must prevail.

The attitude for which "a larger cake is better than a larger slice" opens the door to co-opetition, whose distinctive feature is the predominance of horizontal disintegration by the outsourcing of non-core competencies along with dynamic networks where different but complementary partners come together to create a new venture and, on completion, part company. Co-operation is needed to increase the market share of the industry, while competition remains the essential ingredient that motivates companies to strive for excellence. A complex balance of partnership and rivalry results in a permanent state of disequilibrium. For example, owing to his independent market mission and the ability to sell to many customers in various industrial markets, a problem solver might acquire resources to obtain a much greater advantage over the other parties who have contributed to enlarge the market. In contrast, the traditional competitive paradigm can only lead to each company struggling to make its own share of the market 'cake' increase more rapidly than the 'cake' shrinks. It is an ever-increasing effort, unbearable in the long run. In fact, this strategy requires aggressive pricing and/or costly product customisation. Also it leads to lower margins and diminishes the level of resources available for the development of strategic competencies on which to build competitive advantages.

Co-opetition set off a complex balance of partnership and rivalry across parties in cluster and within them (Jarillo, 1993).

Collaborative advantages are sources of competitive advantages.

Figure 1.11 pigeonholes how the different forms of business collaboration, supply chain and network are interrelated.

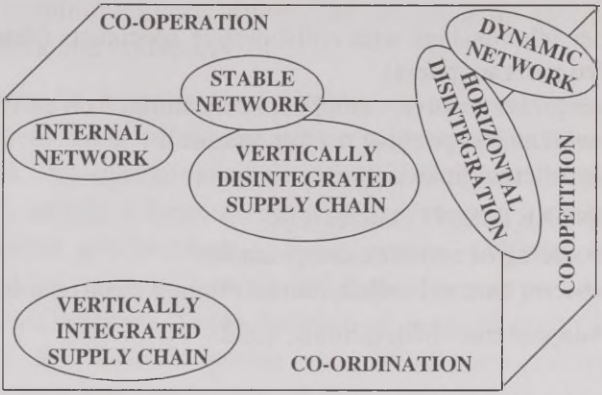


Figure 1.11. Types of business collaboration, supply chain, network, and their matching.

INTERNAL NETWORK — A firm creates a market inside itself. 'Quasi firms' interact through the open market price mechanism. A lead partner ('broker') plays a central role. The 'broker' stands out in terms of experience, strategic capability, and strength of personality.

STABLE NETWORK — Long-term relationships. Independent, specialised firms are connected to a central company (or 'core unit') through contractual solutions. Each independent firm keeps and develop its distinctive competence, serving even other companies outside the network. The central company stands out in terms of experience, strategic capability, and strength of personality.

DYNAMIC NETWORK — Based on short-term or one-time relationships. Several, specialised partners are coupled contractually for a particular project and then part company for the start-up of a new venture, each of them operating at a specific segment of the value chain. There are no special, privileged relationships. A central unit of co-ordination plays the leading administrative role.

VERTICALLY INTEGRATED SUPPLY CHAINS ("mass production")

- Many remote external, commodity suppliers (spot-market/off-the-shelf suppliers.
- Many internal links in supply chain.

VERTICALLY DISINTEGRATED SUPPLY CHAINS ("lean production")

- Closer relationships with collaborative specialists (detail-controlled parts suppliers).
- Fewer problem solvers (suppliers concentrated on early design and with an independent market mission).
- Fewer internal links in supply chain.

HORIZONTAL DISINTEGRATION

- Outsourcing of non-core competencies
- Short-term external collaborations through electronic links.

Source: Adapted from Miles, Snow, 1992.

Co-opetition is further encouraged by web-based trading applications. Within an online community tailored to serve a specific industry, activities can be coordinated in such a way that they are good for the entire industry. A 'net' infostructure appears more promising than a 'pit' architecture where the holders of information behave as the owners of wells. The available information is that the well's owner wants supply. Partial and opportunistic disclosure of information engenders a climate of distrust within the customer-supplier relationships. Conversely, while maintaining the dynamics of competition, the online enriched flow of information allows companies to improve the co-ordination of activities so that, for example, it comes more naturally to sell inventory in excess to direct rivals. Revealing inventory, pricing, design specification and other kinds of hot information to competitors is something that sounds strange in the conventional business culture. Nevertheless, this conduct becomes a crucial challenge, albeit with unpredictable consequences, as soon as companies are aware that they have to change their own behaviour going online (Henig, 2000; see par. 19 in this Chapter).

Co-opetition engenders "business ecosystems" such as the interactive multimedia industry that encircles a variety of com-

panies from different but convergent sectors. Content, computing and communications enterprises comprise an extended web of suppliers and end-users.

Companies in business ecosystems are internetworked from the point of view of organisation, independent of ownership, and work "co-operatively and competitively to develop new products, satisfy a large number of customers in various market segments and incubate new businesses" (Moore, 1993). In the "strategic network" model of business ecosystems, someone in the company "takes the role of 'central controller' and organises the flow of goods and information among many other independent companies, making sure that the final client gets exactly what he or she is supposed to get, in an efficient way" (Jarillo, 1993).

17. BRAND POLICY

'Selling what is produced' has been the IC traditional 'modus operandi'. Buyers like industrial corporations and big wholesale traders thereby dominated IC markets. IC companies, even the leading firms, were price takers. Due to successive evolutions, the 'product-out' attitude has been replaced by a business culture addressed at 'producing what can be sold' and therefore focused on markets, customers and services.

First, IC companies learnt how to increase the export share of their production (the "openness" phase). Later, they deployed and directed their efforts to foster trading relations within a given economic area — the 'natural' one was that of the Euro-

Three phases of trading relations: openness, integration, and globalisation.

pean Common Market — (the "integration" phase). The latest move is that initiated by some early birds among the leading companies, which are now attempting to enter the "globalisation" phase stretching their trading relations across the globe. To be global, they have to be aware that, in one way, it implies the diminished importance of geography (i.e., the European Union area) to trade. It also shows that they have to adapt to each market place in order to be customercentric companies. That means — as Amazon's Jeff Bezo has emphasised — "To listen to customers and figure out what they want and how to give it to them. To invent and innovate for your customers is the object of the exercise. Personalization: put each individual customer at the center of their own universe" (Price, 2002: 71). The challenge is that of devoting a lot of resources, time and energy to export their ideas and hire local people, rather than simply to transfer their technology or people.

We hire local people and I define how global a company is by how many employees are local.

(Jerry Yang, Yahoo's co-founder, interview with Christopher Price, 2000: 33)

Today, wholly or partially owned wholesale subsidiaries, proprietary retail chains and franchising chains are the new commercial weapons.

Brand policy pursued by the leading companies affects the cluster-based business model.

In the past, the leading firms, which have turned into market and price makers over time, took advantage of proximity to their suppliers. The IC local outsourcing mode has proven to be superior to the vertically

integrated business organisation. Nowadays the superiority of local outsourcing seems no more so fetching for the overriding concerns about its enduring capacity to reward industry leaders. Under intense market pressures, they have to make decisions consistent with an aggressive brand policy, vital to boost their market performance.

The new principles on which industry leaders insist are:

- Better brand management is a complement to the traditional build-to-order and customised products, and is also the best defence against the commodity-oriented policy of the low-cost Asia manufacturers. Customers who already value the products should appreciate also the producers who provide them. The brand transmits the message that industry leaders rather than merely manufacturers are solution providers who co-innovate and forge alliances with their clients.
- The industry leaders' ultimate pattern is that of changing entirely into brand owners (BOs). Which means that they will do only the core tasks of researching, designing, prototyping, engineering and marketing products. Everything else, even the final assembly, may be done by the parts suppliers.
- A very close connection between production and marketing implies that production lines are reorganised into modules and sub-modules whose main responsibility is taken by co-makers — to wit, by few but extremely reliable specialist suppliers upgraded as problem solvers to build major subassemblies. As a result, co-makers gain access to the industry leaders' cutting-edge technical developments and, on the other hand, the leaders take advantage of the co-makers' specialised knowledge. In the

Through modularity alongside flexibility, production lines can be quickly reconfigured to reflect demand for particular brand models.

packaging clusters industry leaders and their co-makers develop an increasing number of complete and automatic lines through modular design of integrated machines instead of separate units (i.e., 'monoblocs' rather than separate filling, wrapping, boxing machines, et cetera). Modularity serves a more ambitious mission than that of cutting production costs. It responds to the BOs requirements of improving responsiveness to customers by reducing the time needed to develop and start making a new model (Figure 1.12).

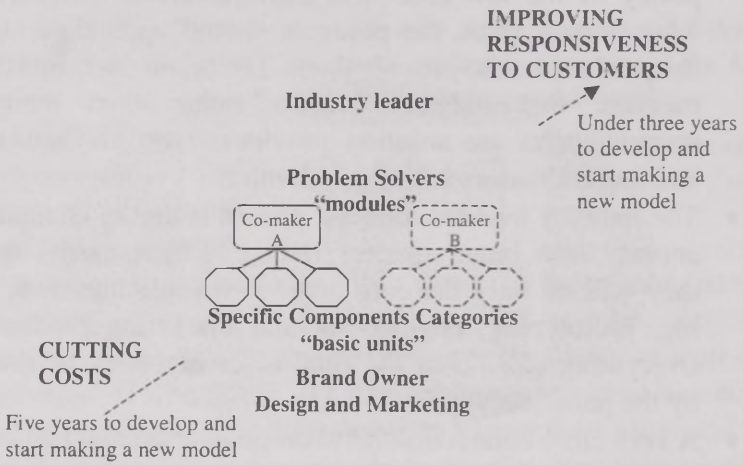


Figure 1.12. Modular production.

- BOs are inclined to create local brands to suit local tastes and needs. Their vision and commitment is to become indigenous brand owners, who have a full understanding of how to do business in that specific country — to wit, "thinking about what makes people different, not what they have in common". This approach may lead to the introduction of a hybrid model between local and global outsourcing. To get the right mix, Industry leaders go international and, therefore, the local cluster expands

outside its traditional borders within the country for example, the industry leader in packaging machines for tea and pharmaceutical products — IMA, which was incubated and grew in the packaging cluster of Bologna (Exhibit 1.3) — is the catalyser of a complementary cluster in Mumbai region.

Brand owners (BOs) concentrate high-margin and headquarters operations in their cluster, but move manufacturing to cheaper, but equally well-run, areas in selected pockets of their country or abroad either. BOs expertise in management and production will be used at the cheaper local rates and property prices, also providing them with access to a wider market.

Exhibit 1.3

IMA — Industrie Macchine Automatiche

IMA (Industrie Macchine Automatiche) is an industrial leader in packaging machines for tea and pharmaceutical products. The company is located in the automatic packaging and processing machinery cluster of Bologna.

The lack of a tradition of technological reliability and high-quality service is a real factor in the difficulties encountered by Bologna-based companies trying to export during the years in which the district system developed.

1980s

The flexibility of production organisation and the versatility of products and solutions were the most important competitive advantages for Italian manufacturing during this period.

Exhibit 1.3 continued

1990s

The great leap forward in customer relations only occurred during the 1990s. The strategic factor making it possible to overcome the problem was the ability to generate value beyond the criteria of price and specification obligations.

Direct business relations, creativity, openness, friendliness and entrepreneurial courage all became critical factors for success. These factors enabled the Bologna-based mechanical engineering industry, together with mechanical engineering throughout Italy, to enjoy a higher annual growth rate than their main foreign competitors.

During the 1990s Bologna-based companies transformed mechanical engineering production from a manufacturing basis into a shared intelligence product. This happened by:

- Investing in services based on personal business relations and the total involvement of individuals in a way characteristic of the small company.
- Spreading of knowledge, both at local level — with ideas such as the Museo del Patrimonio Industriale (Museum of Industrial Heritage) — and at world level — through advertising campaigns and a large presence at trade fairs — concerning the ability of people of Bologna to supply technology and services.

The result has been significant and is perhaps an example to be copied by other districts. This openness, also known under the neologism "co-design", has given IMA as well as other companies in the cluster the right to full membership, for better or for worse, of the mechanical engineering community on a par with Germany.

2010s

Five kinds of innovation will continue to challenge this industry. They are:

Exhibit 1.3 continued

- Technological innovation originated by investing in ideas rather than existing knowledge. A primary role ought to be conferred on invention teams where researchers, business strategists, sales forces, and patent experts are brought together and spend their time with customers to really understand the problems that need to be solved.
- Organisational innovation based on new lifestyles and new aspirations.
- Training innovation as the only viable option to tackle the generation gap and the disintegration of entrepreneurial culture.
- Web marketing. For companies engaged in e-commerce and inserted in "mature" clusters, that is to say capable of distancing external competition without decreasing market value, web marketing can only be implemented solely once policy discussion is underway concerning at least the following three factors:
  - Structural innovation generated by the alliance between companies and the social and administrative environment, based on the production of value rather than subsidies.
  - Current added-value is generated inside the customer relationship, which is the final product of the company, the organisational target. The product itself only generates a portion of the overall cost of the final product. The implications of this concept are still not fully recognised.
  - Web technologies are still immature, not for reasons related to the product itself, i.e. the production potential of dedicated software, but because the web's world approaches the B2B market in an immature fashion, similar to the 'product positioning' of companies undergoing growth during the 1960s.
  - Only as part of a vision that places marketing (suitably redefined) at the core of business growth will B2B companies be able to ensure change, growth and leadership.

Source: Views expressed by Daniele Vacchi, IMA Director of Communication.

By entering into other markets and locations while still seizing the opportunity for local outsourcing to superior suppliers, industry leaders contribute to widen internationally the cluster's image. Apart from brand owners, there are other players like policymakers and groups of companies who invest in constructing a cluster's new identity. For example, the regional government of Tuscany in Italy is leveraging the brand of the industrial districts in the region (Exhibit 1.4). In Brazil, to add to the capacity of resolving the crisis of the Sinos Valley's footwear cluster in the Rio Grande do Sol, a group of local manufactures has incorporated the brand policy in their own business-policy package (Exhibit 1.5).

Exhibit 1.4

Leveraging the brand: The case of the industrial districts in Tuscany

The Regione Toscana is involved in image promotion of the industrial districts in Tuscany. It is being undertaken as a specific territorial marketing policy, aiming to promote and strengthen the visibility of the industrial districts by linking them to the broader image of Tuscany. The industrial districts include leather (Santa Croce), jewellery (Arezzo), textiles (Prato), clothing (Empoli), footwear (Segromigno).

The agenda provides for applied research on the specific product characteristics, research about the image of the Tuscany industrial districts in foreign markets, production of a CD and related promotion. One of the obstacles to date is the balance between the cooperative role within the industrial districts and the competition between specific firms.

Source: The Cluster Alliance Newsletter, May 2002, No 2.

Exhibit 1.5

Reconstructing the identity: The case of the footwear cluster in Brazil

The footwear cluster of Sinos Valley (Rio Grande Do Sol) enjoyed a growth period in the 1970s & 1980s, promoted by North American importers. But gradually, the importers became dominant, taking over the distribution system and product development — and the increase in production and exports was not matched by the development of entrepreneurial market-oriented consciousness. The behavioural standards of Brazilian footwear companies were characterised by their submission to North American importers and by their inertia with regards to technology, product development and distribution. The fragile situation was shaken in the early 1990s by tariff reductions in the local market, and the entry of Chinese footwear. While the Brazilian firms were going bankrupt, the exporting agents left the Valley. Once the initial impact of the crisis had passed, Sinos Valley showed its capacity to bounce back. The cluster underwent market diversification and a radical change in business culture. Businesses turned to the Latin American and domestic market, and invested in product development, constructed their own identity (brand) and made logistical improvements. Other initiatives included managerial training and trade promotion, including participation at selected international trade fairs, and the establishment of a permanent footwear showroom in Miami in April 2001. The machinery, equipment and component manufacturers have also invested in marketing and promotion and recently launched the brand *By Brazil*. The tanneries are thinking about introducing a quality seal.

Source: The Cluster Alliance Newsletter, May 2002, No 29.

18. A NEW BEHAVIOURAL CODE

Both large and small companies profit from interfirm collaboration. In the early stages of the cluster development, the co-ordination mode assures a copious exchange of benefits — as those listed in Table 1.5. Once all the parties have already reaped the fruits of co-ordination, collaboration standards must be raised. That entails a move into more sophisticated relationships such as those centred on co-operation and co-opetition. In mapping out the new route, the greatest responsibility goes to the major industrial players who are those close to the end-users. The incoming efforts to secure a new competitive edge bring back to the forefront the key players' behavioural code.

Table 1.5

Benefits from interfirm co-ordination in the packaging cluster

LARGE COMPANIES WHAT IS GIVEN TO SMALL COMPANIES
• Market outlets.
• Making use of its values associated with its name.
• Incubation of new market niches.
• Business angel in kind (e.g. incentives in terms of: order, advice, client introduction, equipment and machinery utilisation, minority interest).
• Access to information.
• Transmission of informal, tacit knowledge disseminated through face-to-face verbal, uncodified communication.
• Stimuli to innovate within the familiar technologies.
• New applications from existing technologies.
• Learning how to negotiate a relationship.

SMALL COMPANIES
WHAT IS GIVEN TO LARGE COMPANIES

- Access to outsourcing.
- Collaborative specialisation ('focused factory').
- Less costly product customisation.
- Flexibility.
- Help to strengthen the product line-up or aid expansion into new, otherwise inaccessible markets.
- Diffusion of informal, tacit knowledge disseminated through face-to-face verbal, uncodified communication.
- Learning how to negotiate a relationship.

First, they have to turn relationships with suppliers into much more collaborative arrangements even by housing their people. Through 'guest employees' or 'implants' — that is, suppliers' employees working at the clients'site, the leading actors will offer suppliers a better understanding of their requirements.

Second, they need to stimulate entrepreneurship among their employees and encourage those of them who want to set up their own companies. Spin-ees can act as problem solvers and help scout for new products for new markets leading companies cannot scan in-house (Formica, Facchini, Pezzi, 1997).

Third, albeit benefiting from online design and manufacturing, wired collaboration has to be implemented to complement rather than to be a substitute for a 'fine-grained information transfer' (Uzzi, 1997), which entails dissemination of tacit knowledge that lies outside the scope of web-based

The overriding concern of a new behavioural code ought to be that of encouraging more collaborative arrangements between industrial leaders and supplier, stimulating in-house entrepreneurship, and investing in knowledge management.

market ties. Last but not least, industrial leaders have to invest in knowledge management to transform personal into organisational knowledge, as is illustrated in Chapter 2, par. 5. This transformation is the outcome of unrelenting interactions between team members that trigger off cognitive conflicts[3], which, in turn, push participants to change their mental approach.

19. CLUSTERS IN THE WEB AGE

Five hundred years of market creation has seen the transformation of the entrepreneurial economy from the once a week village markets to the 24–7 global electronic markets. Innovative entrepreneurs are making the most of the potential of global connections. They are active members of electronic business communities, which are "networks of suppliers, distributors, commerce providers, and customers that use the Internet and other electronic media as platforms for collaboration and competition" (Tapscott, Lowy, Ticoll, 1998: 19).

The digital revolution reduces transaction costs, making uneconomic the size and the vertical integrated organisation of the modern industrial corporation. Returning to Ronald Coase's theory of firm, which holds that the main reason why firms exists is to minimise transaction costs[4], the fact that the

---

[3] For the definition, see Chapter 2 par. 4

[4] The costs of using a market ("costs of market transacting" or "transaction costs") have been spotlighted by Ronald Coase, 1991 Nobel Memorial Prize in Economic Sciences, and a leader of the new institutional economics. His seminal works on this branch of economic theory are "The Nature of Firm" (1937) and "The Problem of Social Cost" (1960). See also "Firm, the Market, and the Law" by Ronald Coase (1990).

Internet reduces these costs means that it also shrinks the optimal size of firms. The rules of what has been named the "law of diminishing firms" (Downes, Mui, 1998) will be carving out the form of the new ventures. Within the Internet, the key to market dominance is not the size but a bunch of qualities that have much to do with leadership style and value-based initiatives. Successful firms have the qualities of being lean and swift enough to bring producers and customers closer together, and build tighter relationships between them.

The Internet has started to redefine cluster-based relationships, albeit there are still shades of grey in respect of its real impact on clusters. For example:

- Clusters are traditionally like a convoy system, which means that companies in the same sector move forwards at the speed of the slowest. In the e-economy, will this still be true? How many of them tremble lest the spread of the Internet will provide little respite from onslaught of competition?

Will the Internet modify the rules of the game, the viability and sustainability of clusters?

- Clusters encourage the rapid spread of best practices. Can one expect that speed would increase in the e-economy? Will therefore best practices by imitation be sustainable? Might their diffusion impede innovation because "best practices are by and large about efficiency, not innovation"? (Horibe, 2002)
- How will the e-economy change the role of social capital in producing economic capital? In clusters such as the Italian districts social capital comes spontaneously from face-to-face informal contacts. Will clusters' family companies have to re-engineer their social capital formation to embrace and invest in wider networks, virtual and hybrid?

19.1. PHYSICAL MARKETPLACES AND CONCEPTUAL MARKETSPACES

Paradoxically, the Internet, and its use, both challenges the role of space and geography in clusters, and reinforces the value of human interaction between customers and suppliers, buyers and producers, consumers and sellers in defined spaces. The Internet effect is often the creation of a new area of collaboration in the fields of buying and selling products and services as well as intangible value generation.

An industry cluster is a business community embedded in a specific territory where feel and touch are the layers on which trust is constructed. The trust so generated is the foundation for conducting transactions in markets that are bound by limited, physical dimensions. Entrepreneurs, employees, and other businesspersons interact with a fixed and often small number of other people in close, geographical proximity.

New electronic markets will reshape the cluster system. Companies that evolve an unrivalled ability to monitor every movement on their web sites will be making the most from unrestricted access to connections world wide. New markets, new services and new revenue streams will be created. Small firms can find niches, which were not previously possible. Relationships with customers and suppliers will be redefined.

Today a new form of business community is emerging, which replaces (or makes hybrid) a physical marketplace with a virtual, conceptual marketspace. The latter is an electronically created business environment that, therefore, is not constrained by location. It has been defined as "a website that allows businesses to buy and sell industrial products and services using a standard web browser. Buyers can post requests for quotes, while suppliers can create online catalogues. Many sites have additional features such as industry-specific news, auctions, and message boards" (Nairn, 2000). A great variety

of offers ("richness") and the amplitude of connectivity ("reach") in the marketspace give the participants an unlimited capacity to weave relationships by means of 'experienced' and not only 'spatial' proximity, therefore taking advantages of new business opportunities beyond the familiar boundaries.

New forms of communication and new means of distribution might contribute to an increase in price transparency (e.g., online buyers ought to find it easier to discover what sellers are charging) and competition, make price comparisons easier (e.g., sellers ought to find it easier to ascertain what other sellers are charging), and redefine relationships between customers and suppliers. However, there are many factors that conspire to pose a threat to competition, such as the points listed below:

- Cyberspacemen seem inclined to gather. Thus, groups of buyers and sellers tend to converge towards online exchanges that become dominant. Dominant exchanges could lead to collusion practises, such as those of price decisions co-ordination and discrimination against rivals.
- Big industrial and retail buyers aggregate their purchasing requirements. US antitrust officials estimate that a combined purchasing power more than 20% of a particular market causes damage to competition in terms of creating an oligopsony power that lowers output by pushing prices below competitive levels.
- Participation in an online exchange on exclusive terms (i.e., not to work with other exchanges) stifles competition because competitors are locked-out.
- Not only biased online marketplaces can harm competition. This could also happen through the low-cost and high-effective vehicle of collection and use of information in the cyberspace.

19.2. B2B ONLINE TRADING: WILL SMALLER SUPPLIERS THROW IN THEIR HAND?

Business-to-business (B2B) online exchanges affect a large range of costs. Procurement costs can be shaved through the cheapest suppliers that the Internet makes easier to search for, and just-in-time exchanges make possible tighter inventory control and, hence, low or zero stocks (Table 1.6).

Table 1.6

B2B ways of cutting costs

Reduced procurement costs through the cheapest suppliers that the Internet makes easier to search for: • Dealing with suppliers online could reduce the cost of making a car by 14%. • Expected cost reductions by online purchasing: from 2% in the coal industry to 40% in electronic components.
Cheaper to place an order online.
Fewer errors in orders and invoicing: • Cisco's error rate fell to 2% when it switched to online ordering, saving the company $ 500 m. • British Telecom cut the cost of processing a transaction by 90%.
Much lower distribution costs for goods and services delivered electronically: • The marginal cost to a bank of a transaction over the Internet is a mere cent: 27 cents via a cash machine; 52 cents by phone; $ 1.14 by bank teller.
Better information and just-in-time exchanges make possible tighter inventory control and, hence, low or zero stocks: • Dell Computer's build-to-order model completely eliminates inventories.

Source: A Survey of the New Economy, The Economist, 23 September 2000.

If and to what extent suppliers, namely the smaller ones, might suffer from the use of B2B online trading that squeezes efficiency out of the supply chains is a question that raises a range of critical issues listed below:

- How many components, parts and modules might be conceived as commodity items easily described in an online format, so that they are ripe for online trading?
- Are suppliers considering if and how teaming up, like many large buyers have already done, to build their own marketplaces?
- Suppliers are often so fragmented that they would have trouble accumulating enough critical mass to lure suppliers to their site. So, suppliers have little choice but to participate in third-party or buyer-driven exchanges.
- Electronic marketplace forces companies supplying products to final assemblers to lower their profit margins.
- Smaller suppliers feel the squeeze, so they're not sure they're ready to change their businesses over to digital markets. Once they put all their products and prices online, what seems to upset mostly smaller suppliers is a customer-driven process of commoditisation which could shave their already razor-thin margins to microscopic levels. They are afraid that online trading turns their products into interchangeable commodities that buyers could purchase from a number of different companies. It is a bad joke that smaller suppliers have also to pay transaction fees in order to get the "privilege" of being online (Henig, 2000).
- While suppliers have every reason to be concerned about short-term pricing pressure, price will be less of a competitive issue in future versions of online trading sites. According to Forrester Research, "Suppliers should also look to the upside. Their cost of sales drops,

and their reach increases dramatically with no additional marketing costs."

- Suppliers' pricing fears are overblown. The essential argument made is that "buyers cannot ultimately drive margins to the point where they eliminate suppliers' margins, because, in that scenario, their suppliers would disappear. There will be pricing pressure and suppliers will have to adapt, but ultimately the suppliers out there are still needed and are going to keep making money".
- Delivery and quality are big issues too. Industrial businesses are less inclined than consumers to buy solely on price criteria. The right time to get a product and the right quality of it is no less important.
- Exchanges will integrate buyers and sellers, but the question will be whether the buyers and sellers find the exchange more efficient than the link up potential.
- The exchange's inability to consummate transactions online or integrate with back-end systems is a current major shortcoming.

Teaming up, leading companies build their own marketspaces. As a collective group of large buyers, they exercise a strong, short-term pricing pressure on their suppliers, affecting mostly those who provide commodity items easily framed in an online format. Namely, third-parties smaller suppliers will be suffering from dropping prices in terms of lower profit margins. Although "suppliers are often so fragmented that they would have trouble accumulating enough critical mass to lure suppliers to their site", analysts say (Landry, 2000), top suppliers can oppose buyer-driven exchanges by combining their forces.

In the automotive industry a top suppliers-led consortium has been conceived. Likewise, co-makers and collaborative specialists embedded in clusters are taking steps to change the way business is conducted and firms compete in the new digital markets. For example, in Italy, there are industrial districts

that have planned and launched vertical portals as far back as the late 1990s. These portals are mixed business models — that is, they are neither industrial consortia, which are made up of large corporations, nor pure vertical portals made up of independent Internet market makers (see Exhibit 1.6).

Exhibit 1.6

Virtual markets

Companies already holding great market power tend to reinforce their position by enhancing virtual markets through industry-led consortia that replace stand-alone online efforts. Inside an industry that has consolidated around a few large companies, these agree to use a web site for the bulk of their B2B activities, thereby creating an industry consortium. This is also known as a "vertical portal", which is a "pyramid-shaped" biased market (Kaplan, Sawhney, 2000) for it assembles a few big buyers working alongside a fragmented mass of small and midsize businesses which form different tiers of suppliers.

By contrast, online markets built around independent exchanges show fragmentation on both sides of demand and supply. They have been labelled "butterfly-shaped" neutral markets that are either focused on specific industries (named "pure vertical portals") or on specific functions and business processes across different industries ("pure functional portals"). Independent Internet market makers or online intermediaries create this kind of portal within less consolidated industries where there are fewer big players commanding an important share of the market. With the balance of power split between several competing buyers and sellers, all participants share benefits from independent, neutral electronic trading. The highest rewards ought to materialise in the most fragmented industries, those in which no more than 1 to 2% of the market is under the control of a single buyer or seller.

Exhibit 1.6 continued

The unspoken assumption is that liquidity, that is the volume of transactions with customer involvement, "depends on the basic level of fragmentation underlying each industry from the start. The more fragmented the industry, the greater the possibility of value creation for all parties involved" (Henig, 2000).

Once a critical mass of buyers and sellers has been reached, vertical and functional portals allow buyers and sellers to find each other by means of a reduced number of searches and contacts, thereby serving as electronic hubs. Vertical and functional hubs are said to be complement each other. In fact, verticals lack of functional expertise and functionals do not possess domain expertise. For this reason vertical hubs are predicted to form "a patchwork of alliances with functional hubs" (Sawhney, Kaplan, 1999).

There are also portals not involved in sales, acting only as providers of various kinds of industry/processes-specific information in the form of online bulletin boards, online journals, chat forums, et cetera, through which good and bad news travel quickly world-wide.

A vertical industry portal is a web site that provides a gateway or portal to information related to a particular, specialised industry. The portal can also be seen as an interest community web site where people share an interest in buying, selling, or exchanging information about that particular industry.

Vertical portals are often the outcome of startups fomented by family entrepreneurs running leading SMEs in a district's specific industry (see par. 10 above). Districts specialising in mechanical engineering begin to emerge as hubs of digital markets.

There are analysts to whom suppliers' pricing fears seem overemphasised. They outline that buyers need suppliers, so suppliers' margins cannot be squeezed "to the point where suppliers

would disappear". But there is even more than the imperative of necessity. Price is only one variable in the buying decision-process, and industrial businesses, in particular, buy looking at a better management of the whole process, which comprises issues such as quality and delivery time. A better supply-chain management, enhanced by the Internet's continuous, rich, rapid, free and reciprocal flow of information between companies and their suppliers, is even more meaningful than reduced procurement costs. Therefore, B2B e-commerce can contribute to lessen companies' costs by means of gaining extra efficiency through improved relationships with suppliers in substitution for narrowing suppliers' profit margins.

The battle of prices might evoke a model of pure exchange through the process of online trading. On the other side, quality and delivery matters call for a model that links buyers and sellers. This has the most relevance in the case of strategic components and modules providers. Last but not least, a third argument focuses on e-trading advantages for suppliers such as lower marketing and sales costs. Gains from low-cost access to markets might counterbalance the negative pricing pressure that prime companies exert on subcontractors.

Overall, the best online exchanges reject the trade-off between the foundation of long-established relations companies have intertwined with their suppliers and the search for competitive prices, thereby recognising how massive is the intrinsic value of customisation in their contracts with suppliers. In the online world it still sounds virtuous for a company to acquire tools in order to build closer relationships with its own suppliers and involve them in the company's business strategies.

20. CONCLUSIONS: NEW FORMS OF CLUSTER ORGANISATION ARE AFOOT

Historic local craft skills or the proximity of highly skilled individuals in both the business and academic community are the seeds of clusters.

Business collaboration is an ever-rising and long-run learning process.

A successful cluster grows organically as a system of dynamic relationships that show a long-run learning curve of business collaboration. For example, in the case of the knitting and clothing industry cluster in Carpi, after four decades of development both business individuals and researchers observe that there are companies which, in consequence of a widespread individualistic ethos, have not yet overcome the reluctance of opening the business to outsiders and accept the idea of sharing experiences with them, notably in the case of competitors.

The first and more important form of collaboration is represented by a set of informal and implicit behavioural rules. They are the cornerstones of more advanced and structured forms of collaboration. Those behavioural rules are related to professional correctness and honesty. According to the opinions expressed by Carpi entrepreneurs, the cluster has suffered from a climate of uncertainty and instability fostered by the non-observance of behavioural rules such as not imitating or counterfeiting the competitors' models, not exacerbating price competition, giving competitors information about the solvency of potential clients, and disclosing the names of competitors who could solve problems the company is not able to (Sinatra *et al.*, 1994).

It often happens that the evasion of behavioural rules is the consequence of a 'hit-and-run' attitude by firms which take a short term approach and which are always prompt to sacrifice future market gains to short-term profits, disregarding the gen-

eral interest of the cluster. Instead, what is needed for building trust is a modus operandi for which those firms dismiss an egoistic and parochial behaviour, perceiving that their own life and prosperity is tightly linked to the life and the prosperity of the cluster.

Those who cluster round a market are companies endowed with the awareness and capability of networking, each of them safeguarding his autonomy in the meantime that all participants enjoy the benefits of being part of the same flow of knowledge and information. In the early stages, an entrepreneurial culture, which is particularly product biased, sustains a buyer market — a market dominated by price makers who are traders outside the cluster. Later on, 'producing what can be sold' instead of 'selling what is produced' turns to be the dominant trend instigated by the most competitive companies in the cluster. These are the leading primes concentrated on designing and delivering the finished products. Exclusive agents, direct retailing, large scale distribution and franchising chains become the new channels by which a seller market replace the buyer market. The cluster economy departs from the disadvantageous stance of price taker to sit on the more confortable position of price maker.

Once that industry leaders recognise that the arguments they have thought of in the cluster have a much wider applicability, then this would made possible the extension of their operations focusing them outward on to other areas within the same country or cross-border. The delocalization of production first and foremost induced by labour-cost advantages can be the prelude to the formation of complementary clusters.

In conclusion, industry leaders must be seen to benefit the local economy in which they have been investing. Somehow, the pivotal role of the original cluster could be ensured if the opportunities opened up by the structural realignment of production were to become an attractive venture. It requires the

ability and willpower to constantly upgrade and deploy the industry cluster's local resources and infrastructures as a powerful first step toward building a knowledge-intensive cluster. Otherwise those opportunities will be lost. From the leaders' perspective, behind this evolution is a drive to standardise as many parts as possible in the complementary cluster and, at the other end, to be rooted on the ground of the knowledge cluster whether to conceive new products or adapt existing ones to specific needs.

CHAPTER TWO. KNOWLEDGE CLUSTER

The idea that knowledge is something anyone can acquire is recent: for most of history knowledge has been rare and secret, and this esoteric heritage, with its dream of mastery and mystery, survives in the jargon with which every profession protects itself. Knowledge is still a serpent eating its own tail.

(Theodore Zeldin)

When the facts change, I change my mind — what do you do, sir?

(John Maynard Keynes)

1. INTRODUCTION

When we think of clusters most of us still evoke the industrial scenario portrayed by companies involved in manufacturing. The dominant business model has been that of selling products: cars, food, light bulbs, media, et cetera. Yet a subtle shift

is occurring, which sets the scene with a promising new item on the agenda — namely that of knowledge clusters (KCs) embedded in the knowledge economy. KCs contain another perspective of thinking about business, which is similar to Thomas Edison's business model whereby "success is achieved by selling to customers ... the fewest number of light bulbs ... necessary to supply them with the light they wanted" (Wyllie, 2002). Namely, the aim is to provide solutions to customers: light, not light bulbs; transport, not cars; nutrition, not foods; experience, not media.

According to the Voice of Entovation 100 (E100 — see Exhibit 2.6), one of the most successful networks in the world and a leader in the field of knowledge-based innovation (Knowledge Innovation®), "The Industrial Age relied upon scarce resources — land, labor and capital. The Knowledge Economy relies upon the asset of human knowledge, which is bountiful under the condition that it operates as a multiplier — that is, the more it is shared, the more it grows, and the more it can be used innovatively. Otherwise, even human knowledge remains a scarce and costly asset. The services industry is well equipped to capitalize upon the rapid growth potential of knowledge-intensive businesses"[5].

Knowledge is a human process dealing with mental objects, requiring awareness and intuition.

Prima facie evidence of a divide between industry and knowledge clusters is exhibited in Tables 2.1. and 2.2.

[5] For a useful discussion, see Voice of the Entovation 100, 2002a; 2002b.

Table 2.1

Trends in industry and knowledge clusters

INDUSTRY CLUSTER (IC)	KNOWLEDGE CLUSTER (KC)
• Valuing tangibles.	• Valuing intangibles.
• Trading physical products.	• Trading ideas and knowledge-based products and services.
• Optimisation strategies: solving problems.	• Innovation strategies: seeking opportunities.
• Economic planning and forecasting.	• Prospecting future markets, responsiveness to needs and insights.
• Private ownership and controls.	• Shared ownership and co-opetition (combination of co-operation and competition).
• Knowledge filtered by single experts.	• Knowledge filtered by knowledge pools.
• Valuing technologies.	• Valuing people.

Source: Entovation 100 Voice, www.entovation.com

Table 2.2

A tentative glossary of the new age of information and access

Age of access — The age in which connectivity drives toward the access of everyone to everyone, everything to everything, and everything to everyone.
Bionomics — The merger of biological and economic theory. In its more figurative sense, the merger of the world of the made and the world of the born.
Building community — People investing in sharing content and sending messages to each other.
Coevolution — Reciprocal evolutionary change in interacting species. Coevolution pushes competitors into "obligate co-operation". Alliances from co-operation are often asymmetrical for one party takes a greater advantage.
Communication — The basis of culture, which is a process of communication among individuals and groups.
Connectivity — The result of the fusion of computing and communication.
Content — A mere artefact of ability to communicate.
Cyberspace — Communication as a destination in its own right, no more a pipe between physical locations on the planet. Our cyberspace identity is our email signature. Cyberspace is the mall of network culture. Cyberspace is naturally anti-sovereign.
Infoeconomy — An environment in which atoms (products) and property of products have been replaced by bits (information) and sharing of information. Quicker the transmission of information, higher is the value.
Knowledge landscape — An uneven landscape of empty know-nothing interrupted by hills of self-organised knowledge. Knowledge breeds knowledge as well as ignorance breeds ignorance. Knowledge processes consist also in mapping the holes of ignorance.

Metering — Thanks to an information meter, everyone can buy what he likes to drink instead of an ocean of information. Therefore, metering coverts information into a utility.
Net — Less and less a thing and more and more an environment for higher resolution in each other communication. Net tends to grow organically — that is, not according to any person's conscious design, but because it is by nature a collection of individuals all making contributions to it.
Netmarket — On the Net the marketplace is not divided into towns and regions, but into affinity groups. Non-commercial transactions are developed on the Net to foster a sense community.
Netted intelligence — Networking of human intelligence through technology such as interactive multimedia and the so-called information highway.
Network — A factory for information. As the value of a product is increased by the amount of knowledge invested in it, the networks that engender the knowledge increase in value.

Source: Brockman, 1997; Kelly, 1994; Tapscott, 1995; Taylor, Wacker, 1997.

What really does mark the difference between ICs and KCs is the surge in investments for knowledge management and knowledge-workers networking experimented by the KCs. From the Fifties to the Nineties, from Peter Drucker to

Knowledge management is about the flow of meaning. It refers to social communication processes supported by collaboration technologies (e.g., the Internet, Intranets, wireless devices) to create new knowledge and to efficiently re-use knowledge in order to obtain and maintain competitive advantage through improved performance and decision-making of workers.

Robert Reich[6], knowledge workers and knowledge-intensive enterprises have been unceasingly taking over the reins in the most advanced economies. The most important means of production a knowledge worker holds is his innovative mind. To create value and to convert into real wealth the next good idea, knowledge workers need connections and communications. In KCs, investments in networking are intensively made under the assumption that innovation, even a breakthrough, does not only spring from creative types working in intellectual isolation. More effective than eccentric geniuses can be team inter-

Innovation is the outcome of interactions that are conducive to the exchange of knowledge.

Knowledge Innovation® refers to the creation, evolution, exchange and application of new ideas into marketable goods and services for (1) the success of an enterprise, (2) the vitality of a nation's economy; and (3) the advancement of society.

(Amidon, 2001)

[6] In his book "The Practice of Management" (1954) Peter Drucker alleged that "In the United States... the class of employees that has been growing most rapidly in numbers and proportion is that of skilled and trained people." In the "The Age of Discontinuity" (1969) the same author affirmed that the "new industries differ from the traditional 'modern' industry in that they will employ predominantly knowledge workers rather than manual workers". Later in the 1990s he wrote in his "Management Challenges for the 21st Century" (1999): [While the] most valuable assets of a 20th-century company were its production equipment [, the] most valuable asset of a 21st-century institution, whether business or nonbusiness, will be its knowledge workers and their productivity". Robert B. Reich, former U.S. Secretary of Labor, interviewed by www.industryweek.com, has observed that "Globalization has clearly shifted the balance of competitiveness toward human talents and skills... The core of the new enterprise in the 21st century will be talented people capable of quickly assimilating new knowledge and learning from one another" (Verespej, 1999).

actions reconciling restless imagination and intuition, on the one hand, and perseverance and experience, on the other. Networking produces free exchange of ideas, and allows for sharing concepts and connecting theories, methods and techniques, which on its own is inadequate.

Advocates of KCs strongly embrace the idea that it is critical to create a culture of shared knowledge. The underlying assumption is that "the more the knowledge you give, the more you get back". At ICL, the computer group, the top management argues that "there is a relationship between sharing knowledge efficiently and giving time back to individuals. Creating knowledge needs time for reflection. And the fact of sharing, helps knowledge creation". At Unilever, the head of knowledge management has defined as "organisational alignment" the observation that "the more an organisation is connected, the more it can combine insights and knowledge to get creative breakthroughs".

Knowledge management is wrongly assumed as a simple extension of information management. In fact, the former entails major changes not only to technology but, most of all, to corporate culture, operations and relationships.

Unilever's formula for the game is "alignment 50%, processes 30%, and IT 20%" (Jackson, 1998). All in all, in a networked life innovations happen faster and errors are spotted sooner. This seems true in the business field as well as in the academic arena[7]. Whichever way one looks at knowledge management, its primary issue is that of people management (Exhibit 2.1).

[7] See, for instance, how Andrew Wiles has proved Fermat's last theorem, as the story has been told by Singh, 1997.

Exhibit 2.1

Twenty questions on knowledge in the organisation: Results from a survey by Ernst and Young

Twenty questions were addressed to executives within a broad industry coverage ranging from aerospace to utilities, from small businesses to large corporations. Most respondents (87%) described their businesses as "knowledge-intensive" and named multiple types of knowledge as being critical to their competitiveness. Topping the list was "knowledge about customers", followed by "knowledge about best practices or effective processes, the company's own competencies and capabilities, and its products or services". Companies were strongly motivated to improving the intra-organisational transfer of existing knowledge and "facilitating knowledge through culture and incentives".

Asked what benefits from more active management of knowledge their organisations could gain, respondents often said "innovation". 44% rated themselves "good" or "excellent" in generating new knowledge leveraging on people.

Indeed, "an organisation's knowledge advantage depends most on people" — respondents believe — as well as "upon people they put the emphasis about their organisations' ability to compete based on knowledge" (51% of the respondents).

As for the technology tools they believe offer the greatest potential for enhancing the knowledge base of their organisations, respondents said "the most initiatives undertaken to date involve internet access and intranet, decision support tools, data warehouses, groupware, and directories of resident experts. But the top three efforts were again people-oriented: i.e., "mapping sources of internal expertise; establishing new roles; and creating networks of knowledge workers". "Ultimately-respondents corroborated-knowledge management comes down to people management.

Exhibit 2.1. continued

Yet they "were fairly evenly split on the question of whether it would be valuable to create a new knowledge role, such as that of a "chief knowledge officer", to support people-related change. For some, the danger was too great that a staff position focused on knowledge would simply translate into more bureaucracy. "As sometimes happened with Quality — their argument goes — executives in charge might cease to focus ultimate business goals and pursue knowledge management for its own sake".

Respondents were aware of the major role of culture and people's behaviour as the main vehicles for knowledge transfer in the organisation. 54% rated "culture" as the number one impediment to knowledge transfer and 56% "changing people's behaviour" as the biggest difficulty in managing knowledge within the organisation. Also ranking in the top impediments to knowledge transfer were: 2nd — top management's failure to signal its importance; 3rd — the lack of shared understanding of strategy or business model, and the organisational structure; and 5th — lack of ownership of the problem. The report noted "that all of these are 'people' issues; technology limitations and non-standardised processes didn't make it onto the list. This is consistent with respondents' belief that knowledge management must be primarily concerned with people management".

Companies expected additional revenue from new ideas thanks to their ability to manage knowledge. 34 percent of respondents to the survey mentioned "revenue generated by new ideas" as the "most useful measurement of knowledge performance" in their organisations.

Source: Ernst and Young Center for Business Innovation and Business Intelligence (1997), *Twenty Questions on Knowledge in the Organization — Survey.*

2. KNOWLEDGE AND INFORMATION: THE CULTURE DIVIDE BETWEEN INDUSTRY AND KNOWLEDGE CLUSTERS

While ICs aggregate companies primarily concerned with the storage and communication of facts, news or data (call them information), KCs are characterised by knowledge workers engaged in the selection, interpretation and representation of information, so as to augment the body of knowledge, the production and trade of new ideas.

The cultural divide between ICs and KCs becomes evident once the difference between the quality of knowledge and that of information is revealed (Table 2.3). The latter is an inert resource or a static activity of reading, duplicating and broadcasting news. The former is a purposeful and dynamic process of selection and interpretation of information, and of face-to-face interactions through which knowledge is continuously recreated and meanings are assigned to facts that otherwise would remain unintelligible. There is no information without rendering it explicit. Conversely, there is knowledge although not explicit (Sveiby, 1997). This "tacit knowledge", as it is called, one can gain orally by direct experience, trial and error, whereas explicit knowledge is the outcome of formal and systematic learning transmitted in formal and compulsory training courses.

> *Tacit knowledge is a set of intuitions, insights, hunches that are gained through the use of metaphors, pictures, or experiences. It is subjective, not easily perceivable and expressible, below the level of awareness and is therefore difficult to communicate. Explicit knowledge is formal and systematic, articulated in words and numbers, and found in manuals, books, databases and files.*
>
> *(Nonaka, Takeuchi, 1995; Stacey, 1996; Stewart, 1997)*

Table 2.3

Distinctive attributes of knowledge and information

KNOWLEDGE	INFORMATION
• Mental tools that make sense of things. • An evolving set of beliefs about the world. • Knowledge is a crucial production factor that changes old routines in new ones. • Knowledge makes mere information valuable.	• A message that reduces uncertainty.
Dynamic	Static
Dependent on individual	Independent of individual
Tacit	Explicit
Analogue	Digital
Must be recreated	Easy to duplicate
Face-to-face communication	Easy to broadcast

Source: Leonard, 1998; Sveiby, 1997.

It may be noted that free, unstructured interpersonal relationships are a common trait to ICs and KCs. This process of socialisation, elucidated by Nonaka and Takeuchi (1995), incites the dissemination of tacit knowledge (see box 1 in Table 2.4). It can take place if people within the cluster community are endowed with the ability to understand emotions and motivation in other individuals (empathy), and in building and managing relationships. Whether in ICs or in KCs, people share these attributes. But there is a substantial difference. In ICs socialisation has mainly served the purpose of creating inter-firm collaboration

> *Tacit knowledge is generated by workers grappling with everyday problems and passed on in cafeterias. Employees communicate without actually talking.*
>
> *(Micklethwait, Wooldridge, 1997: 142–143)*

and trading links. Albeit in the early stages of IC formation and first development that type of socialisation nurtures a general entrepreneurial culture, afterwards the same process takes a course of action for which its core audience reflects the interests of existing businesses and no longer the inner emotions and enthusiasm of the individuals per se. Because people not companies have knowledge, the consequence of a much greater voice given to companies is that immense care is devoted to passing information around and between organisations, instead of creating and disseminating new knowledge in the cluster. In Nonaka and Takeuchi's phraseology, one can say that it fails the process of transforming personal knowledge into organisational knowledge (see Box 2, Table 2.4 and par. 5 in this Chapter).

Table 2.4

The knowledge-conversion process

	TACIT	**to**	**EXPLICIT**
TACIT	**SOCIALISATION** Free, unstructured interpersonal relationships, developed by means of images or figurative language rather than literal language. Knowledge socialisation generates new, fresh tacit knowledge. **1**		**EXTERNALISATION** Conversion of tacit knowledge in: • words and numbers • scientific formulae • codified procedures • universal principles Conversion from tacit to explicit generates organizational knowledge. **2**
from			
EXPLICIT	**INTERNALISATION** VEHICLES: • oral stories • metaphors • documents manuals **3**		**COMBINATION** New explicit knowledge is generated. **4**

"The key to knowledge creation lies in the mobilization and conversion of tacit knowledge" (Nonaka, Takeuchi, 1995: 56)

Source: Adapted from Nonaka, Takeuchi, 1995; see also Stacey: 457–458.

KCs are characterised by inter-personal relations. Not businesses, but individuals are the KC players. These include entrepreneurs, aspiring enterpreneurs, researchers, investors, professional service providers, and local development officials. Entrepreneurs and aspiring entrepreneurs are the KC's core audience.

The goal of clustering is not to build alliances among firms. It is to build relationships among people who want to change knowledge into innovation and derive business value from it.

(National Commission on Entrepreneurship, 2001)

Building inter-firm alliances is not the primary goal of KCs in which players are individuals, not companies. Their main aspiration consists in stimulating the advancement of the frontiers of knowledge and putting fresh knowledge in motion by enabling a faster transformation of novel ideas into new ventures based on 'discontinuous' (as opposed to 'incremental'), creatively destructive type of changes (Figure 2.1). As will be explained in paragraph 4, a desire to gain access to expertise, shared ideas and learning from one another pushes each individual in the direction of a group of peers or affinity group, or community of knowledge practice. The latter constitutes the basic form of knowledge cluster (as that in Exhibit 2.2). More complex configurations encompass different communities of practice clustering round a knowledge pool

Communities of practices and knowledge pools forge knowledge clusters.

as well as separate knowledge pools coming together (National Commission on Entrepreneurship, 2001a).

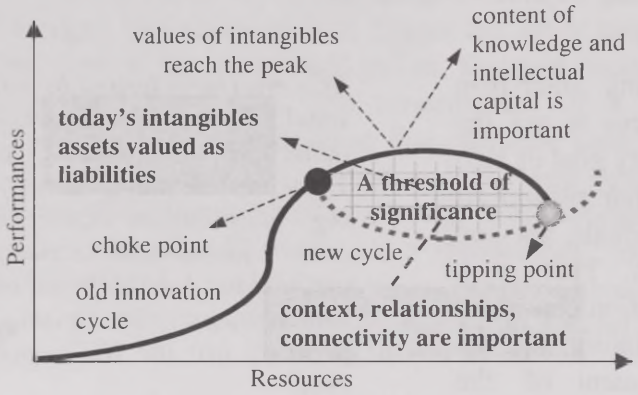


Figure 2.1. How a knowledge cluster works on the threshold of significance.

Innovation is knowledge in action that translates something originating in an experiment (that is, invention) into something newly introduced in the marketplace. It leads to changes in the way of doing things that are perceived as positive by those, individuals or organisations, who make use of it.

The innovation life cycle is represented by an S-shaped logistic curve consisting of the three distinct phases that — as is has been illustrated, for example, by Howard, Guile, 1992: 12 — refer, respectively, to: "emergence (the development of the product or service, its manufacturing capabilities, and its place in the market), growth (where the product family pervades the market), and maturity (where the market is saturated and growth slows)".

George Kozmetsky has observed that "The life cycles of economic goods and services that are digital in form and heavily dependent on knowledge are often short, due to intense product development. As new and advanced products are launched on the market, the earlier generations become obsolete. Typically, the new generation of a product embodies not only upgraded technological and marketing characteristics, but also a wider array of attributes. Defining a product by the vector of services it delivers, the dimensionality of this

vector increases all the time. Products become more complex" (Voice of the Entovation 100, 2002).

The so called "law of tipping point" postulates that the significance of a new round of innovation precedes its momentum.

Exhibit 2.2

The Knowledge Management Cluster®

The Knowledge Management Cluster is a community of practice founded in the San Francisco Bay Area and Silicon Valley in 1998. The focus is knowledge management, enterprise collaboration and electronic business communities. The KM Cluster sponsors and leads popular events in the Bay Area and beyond. Membership in the KM Cluster and its online community is free. The KM Cluster is vendor-agnostic and receives sponsorship from participants only.

Source: www.kmcluster.com

Unlike ICs, where formal R&D competencies and facilities are unusual because SMEs, the major constituency of those clusters, have neither made it a habit to carry on institutional research nor can afford the costs of setting up a formal organisation for research (Manimala, 2002), the combination of R&D explicit knowledge to generate a new one (Box 4, Table 2.4) is an activity accomplished in KCs. Researchers as providers of knowledge participate to KCs with a great demand and

In KCs, knowledge sharing that occurs horizontally through the moulding of communities of practice helps cultivate an entrepreneurial culture in the research environment, unleash business opportunities from new ideas, and enhance productivity of researchers.

need for interacting with users of knowledge in order to share financial rewards of their work. Usually, this happens through the formation of spin-off R&D companies. To these new ventures, which are the outcome of research, they take part as entrepreneurs in partnership with proven business people, risk-capital investors and supported by professional service providers.

3. VALUING INTANGIBLE ASSETS

The overall value of the organisation is judged by the product of two types of capital — the "financial" and the "intellectual" capital, the latter covering a number of intangible assets under the items of human capital and structural capital. This, in turn, is composed of customer capital (that is, penetration, coverage, loyalty and profitability of the customer) and organisational capital.

Human capital refers to the capabilities of the individuals required to provide solutions to customers.

Structural capital refers to the organisational capabilities of the organisation to meet market requirements.

(Stewart, 1997)

There is an inevitable time lag between the decline of today's stars hits and the success of tomorrow's businesses. Non-tangible assets show the highest values when the economy has reached the peak of the old innovation cycle. But this make people blind to novelty.

Collection of legal rights — brands, patents, copyrights, and trademarks —; research and development projects, experience, and trained staff, contribute to that category known as intangible, hidden assets which cannot be seen in traditional balance sheets. The ability of transforming these assets into wealth creating resources is called "intellectual capital".

A tiny vanguard of individuals, who are giving birth to far-reaching changes to come, is overshadowed by the majority made contemptuous by the current values of human capital, marketing skills, patents and brands, and so on — when all these intangible assets are indeed incoming liabilities. So, a stubborn complaisance towards the present endowment of intangibles is an impediment to look outward from the business environment of today and forward to the future. On the surface it seems that the economy has been doing everything right, but in depth that mentality is bringing about wrong results, thereby condemning the country to its future decline.

> *Intellectual Property is a management expression describing that collection of legal rights operating throughout the World which protect and provide ownership for the innovation and reputation achieved by a commercial enterprise. By giving them negotiable rights, IPR financially reward innovators. By allowing the avoidance of competition, then the owner of IPR do not compete in a price driven market.*
>
> *(Kelly, 1998)*

By challenging the prevailing thinking that perceives the seeds of future prosperity in the content of intangibles, the efforts made in a KC environment are addressed to the context in which unseen assets ought to be embodied. The KC-targeted context is that of communities of practice and their gathering in knowledge pools described in the following paragraph. In that context knowledge can produce new routines breaking the old ones, and intangible assets can help redefine current businesses rebuilding themselves completely. KCs can thus operate at the "threshold of the significance" where the importance of a new round of innovation precedes its momentum (Figure 2.1).

The threshold of significance coincides with the 'strait of discontinuity' (region A in Figure 2.1) between two innovation cycles where past and future coexist in the present. Collective actions by participants in communities of practice and knowl-

edge pools enforce courses of action that consist first in detecting and then taking possession of "choke points" (the black dot in Figure 2.1) at the entrance of the strait, so as to open up the navigation to start-ups in technologically progressive new firms enjoying fast sustained fast growth.

Choke points are particular business activities that control the flow of profits throughout an industry. For example, Microsoft's Windows and Intel's microprocessors are choke points in the computing industry.

(Gadiesh, Gilbert, 1998).

In this respect, KCs exhibit an ever-increasing tension between the experience curve, which brings to the capitalisation of the existing structure of knowledge, information and behaviour, and the learning curve, which evokes the need for unlearning or discarding knowledge. The former curve boils down to the capitalisation of the existing knowledge, information and behaviour for which there is a need of predictability (no surprises — that is, "low information entropy"[8]). The latter is about communicating unexpected news (unexpected news is welcome — that is, "high information entropy") (Gilder, 2002: 104–107).

The experience curve describes the decrease in cost (increase in efficiency) due to continuous changes, experience and scale in the manufacturing of any product.

The learning curve attempts to measure the increase in productivity induced by discontinuous changes (or "innovativeness").

[8] "Information entropy measures the content of a message through the news or surprise it contains — the number of unexpected bits" (Gilder, 2002).

In Figure 2.1 the moment when unexpected, radical changes suddenly become a reality is represented by a grey dot at the exit if the 'strait of discontinuity'. This is the moment of critical mass or "tipping point" (Gladwell, 2000).

> *... the world of the Tipping Point is a place where the unexpected becomes expected, where radical change is more than a possibility: it is — contrary to our expectations — a certainty.*
>
> *(Gladwell, 2000)*

4. KNOWLEDGE POOLS

Expenditures in capital goods have been at the forefront of the management thinking in the manufacturing sector. Investing in numerical control machine tools and other production technologies, manufacturers have been able to automate internal processes and manage supply chains encompassing one leading company, specialist suppliers and a multitude of subcontractors. Supply chains have been shaped following the "convoy mentality" in which command-and-control bureaucracy plays the role of warships protecting production and the merchant fleet. Incidentally, ICs have been suffering from that kind of "convoy mentality" that triggers off both a second guess each other-syndrome and a propensity for plotting not to compete on each other's home turf — which "stifles entrepreneurship and keeps markets closed" (Ozawa, 1999).

At the frontline of a KC there are investments in intangibles for networking seemingly disparate parts, each of them being a contribution to the formation of knowledge pools. Compared to ICs, in KCs resources for capital goods investments are in direct competition with those for the formation of knowledge pools, and the ratio between the two tends to shift in favour of the latter (Figure 2.2). In particular, a KC is strongly committed to invest in human capital as a primary source of innova-

tion and renewal. Investments are directed in order to develop the individuals' emotional as well as technical intelligence. The search for networking and socialisation inclines a KC to be focused on how people manage themselves and their relationships with others. Therefore, a KC cultivates what Rob Yeung, a business psychologist, has called "soft skills", such as skills in:

- Awareness: Recognising your own strengths and weakness.
- Regulation: Keeping emotions under control.
- Motivation: Developing optimism and personal drive.
- Reading emotions and motivation in other people (empathy).
- Ability to build and manage relationships.

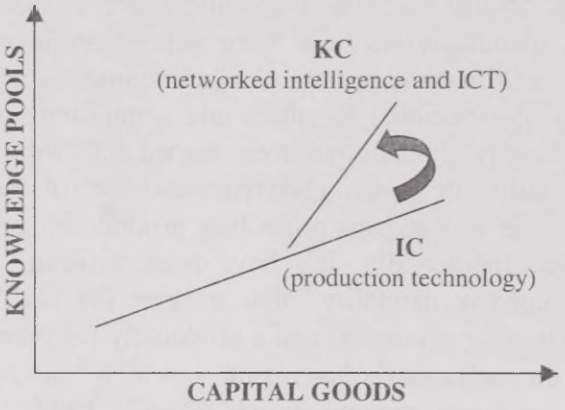


Figure 2.2. Transition from industry to knowledge clusters.

Soft (emotional) and hard (technical) skills plus traditions make up the competencies that permit individuals with different experiences and/or educational backgrounds to intertwine interpersonal relationships within knowledge pools and communities of practice.

A knowledge pool (KP) is a context in which connectivity and conductivity nurture a sense of community. By driving toward the access of everyone to everyone, everything to everything and everything to everyone, connectivity creates "circles of exchanges" and facilitates "journeys into other disciplines or places" (Wheatley, 1992: 113). From these links arise affinity groups or communities of knowledge practice which constitute a KP. On the other hand, conductivity prevents information being passively stored and makes it a fluid process which is a source of new knowledge and also an exchange of knowledge.

Knowledge pools are collective networked intelligence of knowledge workers forging relationships to prove the power of their business ideas and to stretch out their capabilities.

Knowledge workers spontaneously gather in community of practices into which KPs are articulated.

A community of practice is a constituency of many different characters. This community helps to harness the creativity and promote cross-fertilization of ideas necessary for innovation.

These communities tend to be cross-boundaries in terms of geographical and functional borders, and even by including people from rival companies (Exhibit 2.3). Investments in digital technologies are stimulated as technical vehicles to orchestrate communities and KPs. KPs foster learning alliances between business and academia, and make use of the Internet and other electronic media to create a continuous knowledge and learning environment.

Exhibit 2.3

Cross-boundaries, cross-functional and cross-rivalry communities of practice

Cross-boundaries and functional community: the case of the world's first geographic society

The seventeenth-century geographer, Father Vincenzo Coronelli of the Order of Friars Minor in Venice, was the catalyst of a community of practice, the Cosmographic Academy of the Argonauts, which, under various forms of participation, included princes, illustrious savants all over Europe, merchant-politicians and explorers who were the vanguard of European power. Thanks to geographic information obtained inside the community, he improved his cartographic and printing workshops in the Franciscan convent in Venice.

Cross-rivalry community: the case of the Asian communities in the semiconductor industry

"Asian communities stimulate horizontal thinking by forming a community of competitors. In the semiconductor industry, competitive advantage depends on the ability to quickly react to markets and plan in research and development. Forming a community of practice with companies in the industry enables them to keep up with constant change in the marketplace. However, organisational commitment and intellectual property have become major concerns in building communities with competitors".

Source: Wills, 2001: 9–11; Yiu, Li, 2002: 10–11.

KPs cannot be artificially created or designed. Serendipitous accidents and spontaneous actions as well give rise to KPs whose single members "behave like swarms of bees or flocks of birds; aligning with one another and flying in formation for a while, then disrupting their course and exploding into mo-

mentary confusion" (Tapscott, Lowy, Ticoll, 1998: 89 – Figure 2.3).

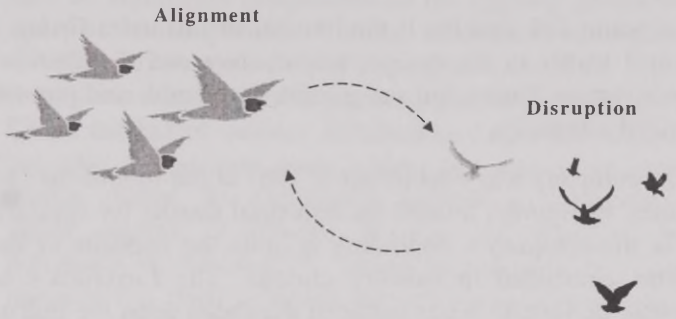


Figure 2.3. Alignment and disruption phases of a free, self-organised knowledge pool.

Entrepreneurs endowed with creativity, leadership, initiative and communication skills stimulate the KP formation (Exhibit 2.4). They may receive assistance offered by knowledge brokers that develop practical applications of the knowledge pool approach (Exhibit 2.5). Different types of actors — from the industry to the academic communities, from the public to the private sector — intervene to discover KPs and supporting them, so as to enable swiftly merge the disparate parts in a self-organising, self-reinforcing manner. By and large, they can be articulated into two main categories: policymakers and employees of (quasi) governmental agencies, and free agents — both are addressed in Chapter 3.

Exhibit 2.4

Leonardo Del Vecchio: The "king of spectacles"

Leonardo Del Vecchio is the founder of Luxottica Group, the world leader in the design, manufacture and distribution of prescription frames and sun glasses in the mid- and premium-priced categories.

The company was established in 1961 at the foot of the Dolomites, in Agordo, around the industrial district for spectacles. Yet the company's imprinting is quite the opposite of those firms embedded in industry clusters. The Luxottica's economic performance has not been depended upon the imitative competition emphasised by the way of working within ICs, but it has relied on innovative competition, particularly of the creatively destructive type, emphasised by Schumpeter.

The propensity to run a race in which a big payoff for his innovative effort is secured to the winner has been cultivated inside the knowledge pool inspired by Del Vecchio. This pool recalls the entrepreneurial spirit of the old-style workshop rather than the bureaucracy of the industrial company.

Having been educated at the Brera Academy of Art in Milano to study drawing and engraving, Del Vecchio's profile is that of the Renaissance man, a blend of artist and artisan, or, in the metaphor of a contemporary business leader, Nobuyuki Idei, chairman of Sony (see Exhibit 2.8), that of an "orchestra conductor who is hearing all the instruments, but is listening for the overall sound". So, the founder and his peers in the KP share an entrepreneurial mindset that prevails on the business-as-usual attitude. This explains why Luxottica has taken decisions that have routed the existing premises in its industry, such as:

Exhibit 2.4 continued

- Vertical integration instead of outsourcing. Luxottica manages all significant components of the eyewear production and distribution process. Vertical integration has enabled the company to produce quality eyeglasses with the lowest production costs and the highest margins in the industry.
- Direct instead of indirect distribution. Luxottica Group is not only a first-class manufacturer but also a pro-active market maker. Its distribution network is operative in major markets worldwide through 29 wholly-owned wholesale subsidiaries. A strong presence in the retail business has been achieved through successive, forward-looking acquisitions: in 1995 the acquisition of LensCrafters, the largest optical retail chain in North America; in 1999 that of Bausch & Lomb's sunglass business, which includes brands like Ray-Ban® and Revo®; in 2001, Sunglass Hut International, a leading sunglass retailer with over 1 900 stores worldwide.
- Stock market quotation to raise accountability and image. The paternalism, which is a widespread sentiment in the family-owned companies, prevents them to become publicly traded companies. The few who decide to be listed in the stock market do this to attract risk capital. Luxottica has been an early pioneer among the family companies of the industrial districts in Italy in going public internationally (listed on the New York Stock Exchange on January 23, 1990), and not because cash problems but as a matter of accountability and image.

All in all, under the guidance of the Luxottica's founder, the knowledge pool has been the context where knowledge development allowed discovering new business paradigms and pursuing opportunities that break away from the familiar routines.

Source: Luxottica Group, Annual Report 2001; Luca Goldoni, *A Far-Sighted Man*, Gruppo Luxottica, 2000.

Exhibit 2.5

The knowledge broker's approach to the formation of knowledge pools

Noesis-CMI AB, a Swedish company, has developed knowledge pool applications by exploring different telematic solutions and a range of combination of telematic tools.

Noesis's solutions help the development process of the knowledge pool as "an interaction and knowledge accumulation environment forming the platform for collaborative initiatives taken all the way from the early-generation stages of a knowledge development initiative and to the final stages of delivery of generated products: e.g. in form of publications, collaborative products, or learning opportunities, and post-'interaction' continuation of the knowledge updating processes".

Source: www.noesis.se/knowledgepool/

Examples of KP-oriented activities include:

- Helping researchers in academia and business to shape the future with new, bright ideas. Anecdotal evidences can be found in R&D-intensive companies such as the US corporation 3M where "scientists are urged to spend 15% of their time experimenting and investing in the area of their own choice" (Collins, 1999: 73).
- Incubation of spin-off companies that encourages people from education and business to become more fully engaged in transforming their implicit knowledge and formal education into new businesses. KPs formed by new entrepreneurs in biotechnologies, life sciences and ICT have contributed to the success of KCs in European university towns and regions such as Cambridge and

Oxford, Amsterdam and Groningen, Helsinki and Tampere, etc.

- Designing novel educational institutions like corporate and entrepreneurial universities where education is conceived and managed in innovative ways in comparison with conventional education provided by academia (Donkin, 1999).
- Facilitating the spontaneous aggregation in KPs of a large number of participants as investors in fast-growing start-ups. KPs of business angels, seed and venture capitalists help to transform a workforce- and payroll-based economy into an entrepreneurial one that enhances business partnership contracts. They create an economy which is on the whole more productive and growth-biased, since the wealth effect generated by a broad participation in a successful process of new company creation raises consumption. The most striking examples are the KCs of the new entrepreneurial economy in the US around MIT and Boston, Stanford University and Silicon Valley.

KPs are a fertile ground for instigating cognitive conflicts, which are "energetic, heated, voluble debate[s] about issues, solutions, appointments, strategies" (Hunt, 1998). In fact, KPs stimulate cognitive conflicts through conscious conversation, which is "a transformational change technique that incorporates deep dialogue skills of reflecting, deep listening, interacting and connecting". This technique permits us to recognize "differences from commonness" and "commonness from differences" (Yiu, Li, 2002). In turn, cognitive conflicts by conscious conversation creates, among KP members, a sense of harmony which is not soporific.

In a KC there is a common belief that "co-operation and harmony are both desirable ends". However even more widespread is the conviction that "excessive harmony becomes

soporific: critical faculties are lost and innovation disappears" (Hunt, 1998).

KPs incorporate the existence of a compromise between individuality and group harmony.

In KPs, confrontation through cognitive conflicts generates new entrepreneurial energy. "Cognitive" is that conflict that stimulates intellectual disagreement rather than personal antagonism induced by "affective" conflicts.

Hence KPs are contexts that back both social cohesion and critical faculties, which, in turn, ignite intellectual disagreement among the participants rather than personal antagonism that affective conflicts tend to provoke.

In KPs new ideas are encouraged and confronted. The outcome of the energy knowledge pools have been generating through the collision of ideas is a "creative abrasion" from which unusual insights spring (Leonard, 1998). In this respect KPs are far different from the usual groups or teams where dissenting voices are not tolerated and each participant feels he is under an obligation to share the opinion of the majority. "Thus, while groups are excellent vehicles to share knowledge and get things done, they are not necessarily stellar at coming up with the best ideas. They can impose the kind of groupthink that discourages innovation" (Horibe, 2002: 19–20). Whereas knowledge sharing and innovation are joined together in the context of a KP.

Participants in KPs are subject matter experts who are both individuals from unconventional backgrounds and people who come from more traditional disciplines. They are mixed together in such a way that each layer comes to terms with the strengths and weaknesses of the others. Diverse conversations between people of different cultural and social background

facilitate the formation of new ideas and prevent the sharing of the same knowledge.

There is not a leader who holds absolute authority. The dominant configuration resembles flexible teams as in soccer and tennis doubles or in a jazz orchestra where each player performs a specific but flexible role. Examples of KPs made up of flexible teams are shown in Exhibit 2.6.

> *Research has suggested that heterogeneous groups outperform homogeneous groups on tasks requiring creativity because of the availability of a greater variety of ideas, perspectives, and approaches to solving problems... Group members must also be willing to share their novel, controversial, or unique ideas.*
>
> *(Chatman et al., 1998)*

Exhibit 2.6

Examples of knowledge pools: from the 18th century Lunar Society to the 21st century pools

Lunar Society (Uglow, 2002)

- A group of visionary, multi-talented, non-conformist, non-academic practical types in the Birmigham of the mid 18th century who were driven by curiosity in the workings of the natural world.
- Members of the Lunar Society were responsible for a brain wave of innovation set in motion by the discover of oxygen (Joseph Priestley), the fine-tuning of the steam engine (James Watt), the modern commercialisation of pottery (Josiah Wedgwood).
- Their achievements include classification of fossils, making of telescopes, creating sparks of electricity, and so on.

Exhibit 2.6 continued

Entovation E100 (Amidon, 2002: Chapter 13)

- A social, business intelligence network for global learning formed by 100 and plus theorists and practitioners now representing around 50 countries. There are thought leaders, CEOs and senior managers, government officials and academic researchers. There are experts in performance measures, competitive analysis and alliance strategy, as well as in computer/communications technology.
- Group perspectives matter more than individual points. All members of the team must widen their perspectives to include an understanding of each other's viewpoints. They are examples of knowledge in action.

Skandia Future Centers (www.skandiafuturecenter.com)

- A strategic meeting place, a greenhouse for cross-fertilisation, interaction and exploration of the brain potential.
- A group of five Future Teams selected from Skandia units with the mission of exploring five key driving forces of the business environment.

Bosch's Virtual Generic Factory

- An exploratory learning environment where simulations and metaphors are used.
- A virtual collaborative communication space based on IT-supported collaborative working technology.
- Web-based extranet, including video conferences and on-line and off-line collaborative tools.

Xerox Palo Alto Research Centre (www.parc.xerox.com)

- Mixes a few anthropologist and artists with computer scientists whose work is central to the company.

Exhibit 2.6 continued

IC2 Institute (www.ic2.org)

- A catalyst for local entrepreneurship and a broker bringing diverse interests together to support the region's economic growth.
- An entrepreneurial-minded organisation that has contributed to Austin's economy through new ideas and on-the-ground actions including technology transfer programs, incubator development, partnerships, network facilitation, and the reshaping of the local perception of entrepreneurs as essential profession open to those from all walks of life.

Fabrica–The Benetton Research and Development Communication Centre (www.benetton.com)

- Supports the creative development of young artist-researchers from all over the world and different educational backgrounds.

International University of Entrepreneurship (www.iue-masters.com/nieuw)

- A knowledge pool approach to the partecipation of learners to the formation of learning opportunities.

5. THE PROCESS OF KNOWLEDGE CREATION

Knowledge creation and organisational knowledge creation are the means of "breaking away [companies] from the past and moving them into new and untried territories of opportunity" (Nonaka, Takeuchi, 1995: 4).

Companies belonging to ICs are used to making things. Therefore, their trading activity is mainly one of exporting and importing atoms (i.e., physical objects). Producing more hardware than software, more machines and apparel than informa-

tion, companies hang on the efficiency and effectiveness of their carriers to deliver atoms (Negroponte, 1995).

People who coalesce in KCs are key players in generating a new kind of business organisation: the "knowledge-creating company". This company adopts ways of working traditionally associated with education. By absorbing intellectual capital and, thereby, moving its barycentre from material to intangible processes, the knowledge-creating company (KCC) resembles a training and research institute which learns and encourages learning in its people (Handy, 1995), but of a generative rather than an adaptive type. In the words of Nonaka, Takeuchi (1995: 44), the first kind of learning "is establishing new premises (i.e., paradigms, schemata, mental tools, or perspectives) to override the existing ones", which are influenced by past experience.

Learning is the increase in the amount of response rules that are the result either of existing premises or of new ones.

Generative learning increases the amount of pro-active responses opposed to reactive-responses.

Because an organisation cannot create knowledge on its own, KCCs encourage the initiative of their people and provide a shared context (say, community of practice and KP) in which individuals can interact with each other. "Team members — argue Nonaka and Takeuchi — create new points of view through dialogue and discussion. This dialogue can involve considerable conflict and disagreement, but it is precisely such conflict that pushes employees to question existing premises and to make sense of

Organisational knowledge creation is the [generative-] learning companies' ability to create new knowledge through systems, routines, data within an organisation which are only imperfectly understood by any individual member.

(Kay, 1995)

their experience in a new way. This kind of interaction facilitates the transformation of personal knowledge into organisational knowledge", which is new knowledge KCCs employ in order to reconfigure their business relationships according to the market needs, so as to conceive commercially valuable innovations. (Figure 2.4).

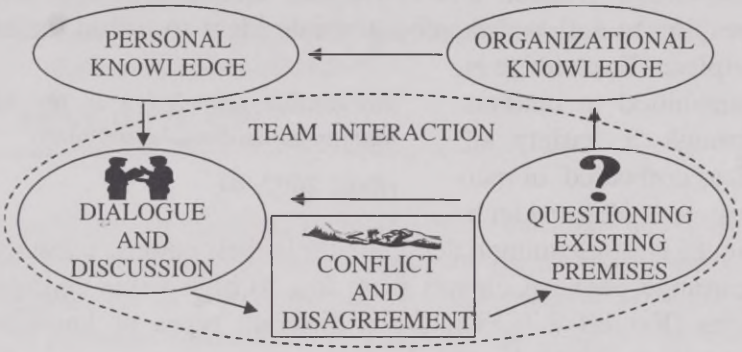


Figure 2.4. Transformation of personal into organisational knowledge.

Source: Adapted from Nonaka, Takeuchi, 1995.

In view of the above, the KCC's work environment is a living organism rather than a machine for processing information, within which intensive and laborious interactions among team members allow each individual to learn from others as well as to acquire knowledge from outside. In such a way knowledge is created, and organisational knowledge creation stems from the conversion of tacit into explicit knowledge (Nonaka, Takeuchi, 1995).

6. COMMERCIALISATION OF KNOWLEDGE

Debra Amidon, a pioneer in the field of knowledge management, has defined innovation as "knowledge in action" and has

simplified the innovation process into knowledge creation, knowledge conversion and knowledge commercialisation.

Knowledge is the content and innovation is the process whereby we put knowledge to work.

(Amidon, 2001)

Knowledge creation and conversion enable KCCs to assign meaning to data and thereby generate ideas to sell in the marketplace. Knowledge is transmitted to markets through a variety of ideas embodied in recipes, formulas and techniques whose common denominator is their endless capacity to rearrange physical objects from low to high value configurations (Exhibit 2.7). There are different types of knowledge markets like those listed below:

Marketable knowledge is the ultimate organisational capability.

(Reid, 2002: 4).

- Know-how: skills in managing practical processes, which means selling the knowledge of how information must be processed.
- Know-what: knowledge about facts — that is, what sort of information is needed.
- Know-why: explanatory science — that is, why a given type of information is needed.
- Know-where: where information can be founded to achieve a specific result.
- Know-when: by what time information is needed.
- Know-who: knowledge about socially related understandings (van der Speck, Spijkervet, 1997; Reid, 2001: 5).

Exhibit 2.7

Examples of transformation of things from low to high value configurations

- From silicon used primarily to make glass to its use as a crucial component in microchips and optical fibers.
- From wood-intensive campfires to clean, efficient natural gas to cook food.
- From heavy earthenware pots to ultra thin plastics and lightweight aluminium cans.

Source: Bailey, 2000.

Knowledge commercialisation presents four main characteristics. The first is that the producer of knowledge unlike the manufacturer of a physical product still keeps it once knowledge has been surrendered in exchange for money. This raises two points:

- From one point of view, knowledge goods are, in the economic termonology, "nonrival", that is they can be used by their vendors and buyers simultaneously. "Knowledge — as knowledge experts say — is not given up in exchange for money in the same way as a cream cake. You can't eat your cake and have it, but you can sell your knowledge and keep it" (Hampdem-Turner, Trompenaars, 1994). Whereas, things made up by mass or energy are "rival" in that they cannot be used by two or more persons at once (Bailey, 2000).

Paul Romer, the founding-father of the new growth theory, divides the economy into ideas or "nonrival" goods, which can be stored in a bit string, and things or "rival" goods with mass, or energy. For example, cars are rival goods; recipes, formulas and techniques used to rearrange things are nonrival goods.

- From another point of view, knowledge is not a limited-resource market like agriculture, mining and bulk goods, whereby a fixed-resource constraint is put on their trading. Knowledge markets are not affected by a short supply of ideas, being infinite the potential for finding new ones.

The second aspect is that, compared to physical products, the exploratory phase of knowledge-creation — think about the design and tooling of a new chip, a new drug, or a new gene therapy — is very expensive because it needs a big initial investment, but the production cost of copy in terms of knowledge-intensive products or services becomes cheaper and cheaper, almost nil. Therefore, knowledge-based businesses benefit from increasing returns, or decreasing costs (Exhibit 2.8)[9]. As the market grows, returns can increase enormously.

Knowledge is a near-endless-resource market, not subdued to the iron law of scarsity and diminishing returns.

[9] Since there are many cases of increasing returns that seem irreversible, economists have been inclined to call them "downward shifts of the supply curve rather than increasing returns" (Kindleberger, 1963: 101).

Exhibit 2.8

Sony's chairman on the law of increasing returns

The most striking examples of benefits reaped from increasing returns are those KCs that are at the crossroad of industries like personal computers, consumers electronics, information, telecom, music and films, education. The statement of Sony's Chairman herein quoted is a case in point. But the same law is applicable to other KCs that encompass industries ranging from apparel and sweaters (e.g. KCs around Benetton in Treviso, Italy) and personal care to pharmaceutical producers and health services (e.g. KCs around Karolinska hospital in Stockholm).

Nobuyuki Idei, Chairman of Sony, says:

"The law governing the manufacturing industry is a law of diminishing returns. That is, at some point it costs more to produce and sell the next widget than you can justify economically.

But technology has created exceptions. The most obvious is digital content such as software, where the marginal cost of producing the next copy of the product is near zero. That phenomenon brings about a process known as "increasing returns." Microsoft has most famously proved this to be true, but it applies to any popular software platform.

There's also an exception in the manufacturing business. With semiconductors, including memory chips and microprocessors, the cost of creating a new chip design and factory is enormous but the cost of making each chip after the first is small".

Source: Nobuyuki Idei, 2000.

Third, producers have the power to charge high enough prices to pay for the exploratory phase (Klein, 1996). In fact, knowledge markets are somewhat removed from the competitive end

of the scale that measures if and how great an influence producers can exert on prices. These markets are characterised by imperfect, or monopolistic competition (Robinson, 1960: 222–245) — that is, a contextual presence of elements of competition and monopoly, which are intermingled in a degree that varies widely, depending on both the heterogeneity of what is on offer by the monopolistic competitors and the preference customers show for one firm over another. Indeed, heterogeneity is a distinctive feature of knowledge markets. In most of these, competitors are completely differentiated once they create ideas that modify the functions performed by finite resources so as to make available to the potential buyers a broader spectrum of possible solutions.

Fourth, imperfection of competition upstream, at the stages of knowledge-creation and production, fosters more competition downstream at the point of distribution. End-users can profit not only from the availability of more choices and a wider variety of outlets that enable them to spend their money somewhere else, but also from significant price reductions which competing vendors can sustain from increasing market growth.

7. INDUSTRY CLUSTER AND KNOWLEDGE CLUSTER MODELS OF ENTREPRENEURIAL MOTION

As John Milton-Smith (2000), an academic member of the International Forum of Entrepreneurship[10], suggests, entrepreneurship has a broader meaning. It is, he argues, "a description

[10] The International Forum of Entrepreneurship is an international network of academics, practitioners and businesspeople conceived and promoted by the Enterprise Research and Development Centre at the Business School at the University of Central England in Birmingham, UK.

of certain behaviours, skill and attributes which corelate closely with innovation and dealing with situations involving high levels of uncertainty, competitiveness and complexity. Entrepreneurs do not necessarily conduct an independent business, but they do create new value or new organisational capability. Whereas corporate-style managers and bureaucrats — the sort of people you find in traditional big businesses, government agencies and universities — are primarily concerned with function, position, power, territory and status, the entrepreneur is typically characterised by creativity, enterprise and growth".

An entrepreneur is an independent agent who adopts a set of rules, consistent with a 'search-and-satisfying' type of behaviour, in order to reach goals such as growth and profitability of his or her company. In doing this, the entrepreneur is driven by curiosity and an instinct for exploration — a combination in which intentional action and the faculty of making lucky and unexpected finds by accident sit side by side. Somehow, entrepreneurs are the incarnation in the real world of the characters of a fairy story, "The Three Princes of Serendip"[11], who "were always making discoveries, by accidents and sagacity, of things they were not in quest of". They accept that everything is a matter of degree — that is, they "expect every 'well-formed' statement to be not true or false, but true more or less or false somewhat". In other words, they believe that "A and not-A holds to any degree" (Kosko, 1994). By the way, this logic, which is of Buddhist origin and has been defined as "multivalent" or "fuzzy", in contrast to Aristotle's "bivalent" logic, marks the most distant frontier between entrepreneurs and those scientists, mostly from the Western culture, who

[11] Serendip is an ancient name of Ceylon. It seems that the word serendipity was coined by Horace Walpole, who formed it on the title of that fairy story (The Wordsworth Dictionary of Phrase and Fable: 981).

deem that fuzzy logic is wrong and pernicious, notwithstanding the number of innovations that originated from it.

Therefore, to find their own way, entrepreneurs look for many windows and take quick decisions, albeit sometime they need to move slowly towards their target. Eventually, they have to see which way the wind is blowing.

Small businesses have been depicted as the epitome of entrepreneurship, and entrepreneurial communities have been defined as those communities in which small business founders have formed a free, self-catalysing network whose members act like a flock of birds, aligning with one another and flying in formation, as shown in Figure 2.5 Indeed, in these communities (often also referred to as "industry clusters") entrepreneurial moves can be identified that resemble the motion of a flock of birds flying, as described in the model created by Craig Reynolds and revived by Gary W. Flake (Flake, 1999).

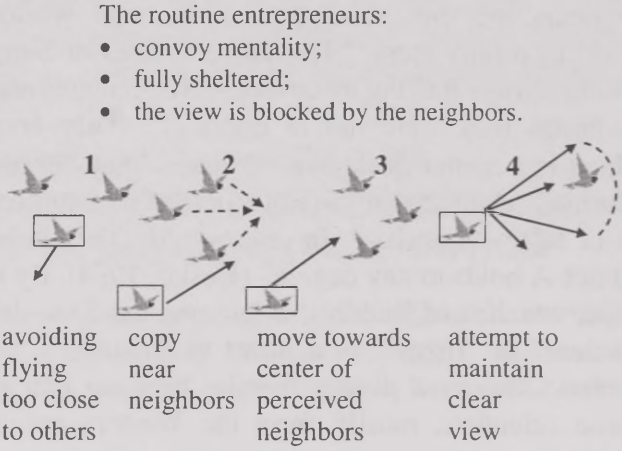


Figure 2.5. Industry cluster-type model of entrepreneurial motion.

Source: Adapted from Flake, 1999.

Figure 2.5 shows how the model works for small businesses in the IC context. In the figure this context is portrayed as a flock of birds. The bird framed in black represents a new, small business founder. His or her movements are articulated in four sequential steps:

- *Step 1* is the ***differentiation*** movement. As each bird avoids flying too close to another in the flock in order to reduce the chance of a mid-air collision, so the new founder attempts to make his or her business distinct from the others in the cluster.
- *Step 2* is concerned with ***copying or imitation***. After a successful start-up phase, the new company's founder conforms to the group's convoy mentality. Replicating the movements of the neighbours, the entrepreneur now follows the general direction of the group. The prevailing pattern of competition is that of the imitative competition close to perfect competition, which requires a large number of firms in an industry. Overall, the outcome of the small business is a bounded performance in terms of limited growth prospects, albeit occurring with a lasting profitability — which is however judged as a successful accomplishment or even a "cause for celebration".
- A ***move towards the centre*** constitutes *Step 3*. Protection reinforces the imitation move. A defensive perspective incites the small business founder to take position at the centre of the perceived cluster/flock where there is the least exposure to external threats. However, in taking this shelter, his or her view is obstructed by neighbours. Deprived of a range of vision, the entrepreneur will lose the capacity for differentiation that requires lateral movements. This prompts the small business founder to move to:
- *Step 4* in which he or she attempts to maintain a clear ***view*** of future prospects.

These entrepreneurial movements explain why most businesses start and remain small, even after many years of trading. For them, the growth period never occurs, or else it comes too slowly and too late, sometimes even as a precursor to the death of the business.

The IC is a living system in which a company can survive, fitting its actions to the cluster's average behaviour and established practices. But there is a trade off between pursuing a comfortable state of equilibrium, which maintains the independence of the founder's small company and provides economic support for his or her family, and enhancing the founder's entrepreneurial capacity and entrepreneurial opportunities. Dumping down both of them is the price paid for self-preservation and maintaining this unimaginative approach and the status quo. Therefore, the small business does not transform into growth company.

There are, in contrast, small businesses that from the start enter into a rapid high-growth phase and others that 'morph' into growth companies. These are the "Entrepreneurial Growth Companies" (EGCs). The fertile ground for their incubation, start-up and development is that of the KC. Figure 2.6 shows the main differences between the entrepreneurial movement of high-growth businesses in KCs and that of traditional small firms in ICs. Whereas Table 2.5 gauges the importance placed on new and emerging entrepreneurial companies in terms of new jobs and innovation they generate.

KCs fuel the new entrepreneurial economy — that is the formation of fast-growing start-up companies in every economic sector from high tech to manufacturing. These are the main engines of wealth and job creation.

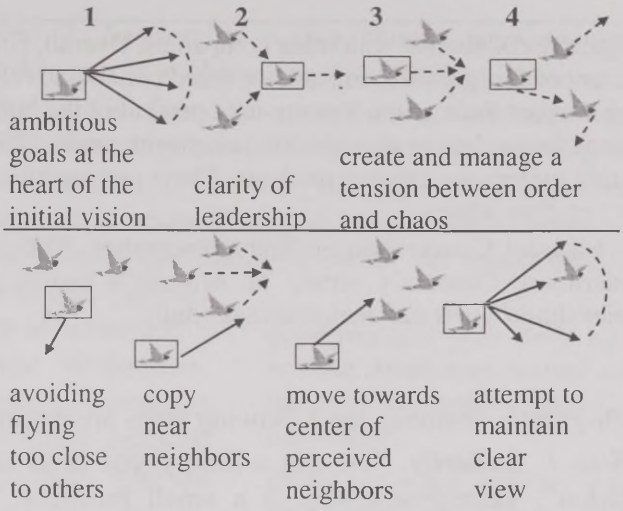


Figure 2.6. Knowledge cluster-type model of entrepreneurial motion (top) compared to industry cluster-type.

Table 2.5

The importance of new and emerging entrepreneurial growth companies: The "two-thirds" change agents

Small entrepreneurial companies cover a small proportion (5–15%) of all U.S. businesses. Yet data collected over the last 20 years show that these companies:

- Create two-thirds of net new jobs.
- Are responsible for more than two-thirds of the innovation in the economy (and 95% of all radical innovations created since World War II).
- Account for two-thirds of the differences in economic growth rates among industrialized nations.

- Regularly collaborate with other companies. Overall, fifty-six percent of fast-growth companies worked collaboratively during the past three years. Twenty-nine percent of the collaborations focused on new product development, while 37% sought to improve existing products. These partnerships were not one-time affairs.

Source: National Commission on Entrepreneurship, 2002c, 2002d; Pricewaterhouse Coopers's survey of America's fastest growing companies (http://www.barometersurveys.com/).

For high-growth business, the following steps are discernible:

- *Step 1.* ***Audacity***. "To win a lottery you need to buy a ticket". Entrepreneurship is a small business "with a lottery ticket attached" — reports the National Commission on Entrepreneurship, quoting Amar Bhidé, who has written seminal papers on the origin and evolution of EGCs. EGC founders have bold and ambitious aims. Identifying business opportunities different from those already available in the market is not enough. Compared with small business founders, their vision is much more audacious. EGC founders aspire to create companies whose course of growth is well-defined from the beginning — often at an annual rate of 15 to 20%. Therefore, they capitalise on opportunities convertible into marketable products and services that offer potential productivity gains higher than those selected by small business founders (National Commission on Entrepreneurship, 2001b). The prevailing pattern of competition is that of the innovative competition resembling a race in which the winner takes all not because he obtains a decisive advantage, being, eventually, the first-mover in the game, but because he can deliver a plainly superior product (Liebowitz, 2002).

- *Step 2.* ***Leadership rather than experience in their fields marks a difference.*** In pursuing their audacious goals, EGC founders cannot act as followers who imitate close neighbours. To run fast and win they have to be forerunners. This does not necessarily mean that they have to be experienced experts in their fields nor that their companies must be based on breakthrough technologies. The clarity of leadership is their distinctiveness. In contrast to small business founders, who are catalysed by a cluster, entrepreneurs in EGCs head for new cluster formation and are thus catalysts of small business growth and development. They are driven by the motivation to share, whereby collaborating with other firms instead of going it alone becomes the essence of their business — as found in a new survey of America's fastest growing companies from Pricewaterhouse Coopers, which estimates that collaboration has generated bottom line benefits, accounting for nearly a quarter of current revenue (Table 2.7).

> *Entrepreneurs with little expertise in their fields have started many of the most successful entrepreneurial companies.*
>
> *EGCs often are not the ones that first make the great discovery. Rather, they tend to make smaller innovations in products or processes and then perform exceedingly well. As companies fund research and make discoveries, they tend to develop breakthrough technologies.*
>
> *(National Commission on Entrepreneurship, 2001a)*

- *Steps 3 and 4.* ***Surfing the edge of chaos.*** EGC founders create and manage tension between order and chaos. The success of growth companies is dependent on a ceaseless process of revitalization that allows for fluid, open boundaries and new connections. Between the

equilibrium of an orderly cluster and the disequilibrium caused by a fundamental disturbance that explodes in disruption, surfing the edge of chaos maybe uncomfortable but necessary for fast-growing new businesses.

In the remaining paragraphs we will seek to unfold the arguments that contribute to making a KC environment suitable in the formation of EGCs.

8. ENTREPRENEURSHIP IN THE KNOWLEDGE DOMAIN

Entrepreneurship is the process by which knowledge inputs are changed into knowledge outputs — i.e., into novel combinations of factors of production in order to offer new solutions to customers in the marketplace. This process requires passion, competencies, and a powerful skill to sell (Exhibit 2.9).

An entrepreneur's passion for what he or she does is at the heart of the entrepreneurial process.

(Smilor et al., 2001; Smilor, 2001a)

The imperative of selling conflicts with the traits of talented scientists, researchers, graduates and students. An abundance of talented people does not automatically produce a high-performing knowledge-based business community. World-class researchers are not often world-class entrepreneurs.

Exhibit 2.9

Selling: A powerful skill that every entrepreneur has to have

"Really great entrepreneurs argues Ray Smilor, President of the Foundation for Enterprise Development, a La Jolla, California — first sell themselves to investors and others, then they sell the concept of their company to employees, then they sell their product or service to customers. And really [great] entrepreneurs begin to see selling not as this hated skill, but as a skill that's essential to their success and the success of their company. A way to make selling less painful is to see it for what it really is. You're not forcing something on a person that they don't want; you're helping somebody buy what they really need. So the first step is to change your frame of mind about the skill of selling. Second, I think it's important [to be an] exceptional listener — to take time to listen to what the other party has to say, to what their genuine need is, to what the problem is. Then shape a response that solves the problem or meets the need. Third, I think [you need to] actually practice selling — get out there and get better at listening, responding and probing — those kinds of things make this most hated skill become quite natural".

Source: Ray Smilor interviewed by Joelle Wolstein, "Why you do what you do as an entrepreneur — and why we need you", *Entrepreneurs.com*, 07 June 2001.

To encourage entrepreneurship in the knowledge domain, it makes sense investing both in raising entrepreneurial education among individuals with a scientific background as well as among people with a managerial and humanistic background, and melding these groups together in order to engender knowledge-based start-ups. From the self-employed to people working within organisations there is a diverse range of individuals displaying entrepreneurial attributes. Disparate factors feed the

process of knowledge-based company creation. A list of this factors would include:

- Cultural roots, heritage, knowledge, skills, and experience enjoyed by individuals. They hold a greater value than capital equipment.
- Entrepreneurial spirit among youth, enhanced by an entrepreneurial education and the process of learning about how running a business at a young age.
- Students and graduates from business and technology schools, from science and art faculties, who are prepared to cooperate in the setting up of EGCs.
- Business agent that catalyse KPs. They allow a better matching between scientists and technologists with product and process ideas, and managers, financial and marketing specialists able to commercialize those ideas. Moreover, business agents are focused on marketing and sales, and, therefore, they maintain daily contacts with growing businesses.
- Mental tools for exercises in market foresight. For instance, time to-market techniques and market-focused technology audit of research activities in order to seize the window of opportunity. As experts say, "Coming too early the spin-off burns too much cash. Coming too late others have already taken up market positions".

Market foresight is the ability of discovering future markets by developing sustainable future visions and not merely projecting forward forecasts. Whereas market watch is the ability of matching innovative solutions with problems detected in the actual markets.

- Partnerships between would-be entrepreneurs and established companies as "launching customers" (Exhibit 2.10). In particular, thanks to links with companies

operating in different industries, start-ups can take a broader view of what they are going to have to learn — which frequently come from outside its own industry. There are evidences that a good management of in-cluster and cross-cluster alliances raises the start-up survival rate up to 90% after five years.

Exhibit 2.10

The Dutch Twinning Scheme

One example of how high-innovative start-ups have access to external business partners is the Dutch Ministry of Economic Affair's Twinning Scheme, a mission for stimulating people to become entrepreneurs in the field of ICT and helping them grow their companies to become world-class.

Twinning means launching start-ups that are not isolated but networked to Dutch and American industrialists in KCs, with a proven track record in the ICT industry. Leading ICT entrepreneurs across the world shape a Twinning Network that offers starters the best coaching and support available. The Twinning Network partners support starters with knowledge, contacts, experience, and help also write business plans.

The business idea has to meet four basic entry criteria:

1. It must be an ICT related idea (e.g., related to Content and Software, Communications/TV and Services, Public Network Equipment, Components or User Equipment).
2. It should be innovative (e.g., a new product/service, a new application of an existing product/service, or a combination of these).

Exhibit 2.10 continued

3. One example of how high-innovative start-ups have access to external business partners is the Dutch Ministry of Economic Affair's Twinning Scheme, a mission for stimulating people to become entrepreneurs in the field of ICT and helping them grow their companies to become world-class.

4. Twinning means launching start-ups that are not isolated but networked to Dutch and American industrialists in KCs, with a proven track record in the ICT industry. Leading ICT entrepreneurs across the world shape a Twinning Network that offers starters the best coaching and support available. The Twinning Network partners support starters with knowledge, contacts, experience, and help also write business plans.

5. The product or service must be exportable, with the potential for high growth in international markets.

6. The company needs to be a start-up (that is, in the process of developing or commercialising its product/service).

The evaluation process takes 5–7 weeks. Twinning Network partners and other renowned ICT experts are the business plans assessors. An interview with the candidate does assess his capabilities and commitment. Partners and experts within the Twinning Network sign a confidentiality agreement with the candidate.

Twinning centres offer housing and coaching (through the Twinning Network) to the start-ups admitted to the scheme. The Twinning Centres have also close links with universities, research institutes, and local ICT businesses. Rents are around market level, and typical duration of stay is between 2–3 years.

Exhibit 2.10 continued

All parties involved are embedded in Twinning Virtual Community, a KP that is an Internet meeting place for entrepreneurs, financiers, support organisations and coaches. It offers the opportunity to join in discussion forums on ICT related issues and to apply for Twinning support. The Twinning Start Fund and the Twinning Growth Fund provide finance to the starters. Twinning Start Fund is a seed fund that provides convertible loans or equity to ICT start-ups. Twinning Growth Fund co-invests in ICT companies in the growth phase alongside private sector capital firms.

- Networks made up of business firms experienced in market foresight, local seed capital funds and wealthy individuals ("business angels"). This type of collaboration increases both the amounts of funds to develop a sufficiently large portfolio of pre-start-up organisations and the ability to transform inventions into marketable innovations. The thicker the networks, the richer the opportunities the new businesses can exploit.

9. THE TECHNOLOGY ENTREPRENEUR

The entrepreneur who typifies the knowledge-based entrepreneurship is the technology entrepreneur, or technopreneur. He or she is, usually but not always, a scientist or researcher, who, being accustomed to work with industry, combines research, creativity, entrepreneurship, and willingness to take calculated risks.

"The word 'technopreneur' states Milton-Smith, is of recent origin. It was probably first used in Singapore in the early to mid-1990s as a way of highlighting the need to generate more entrepreneurship in the technology sector, as opposed to the

more traditional areas in which entrepreneurs operate, such as property development, retailing and trade. There was certainly a widespread view that technological entrepreneurship in Asia — not just Singapore — had lagged behind Europe and the United States of America". Thus, in recognising the need to spur technopreneurs, the Malaysian government launched the Technopreneur Development Flagship programme in November 2001, and the Technopreneurs Association of Malaysia was established (Exhibit 2.11).

> *A technopreneur is a person who effectively brings together research talent, venture capital, new business concepts and management skill in order to create commercially successful technological innovations or, alternatively, uses technology to effectively leverage innovations.*
>
> *(Milton-Smith, 2002)*

Exhibit 2.11

Excerpts from the Technopreneurs Association of Malaysia

Definitions of "technopreneur" and "digital economy"

- "Technopreneur" means a person who uses the application of digital technology to industrial or commercial objectives or one who organizes, operates, and assumes the risk for a business venture in the Digital Economy.
- "Digital Economy" is an economy based on the digitisation of information and the respective information and communications infrastructure including the technology therein involved.

Categories of membership

- A "Member" refers to Technopreneurs and individuals who are directly involved in the Digital Economy and a fee-paying member of the Association.

Exhibit 2.11 continued

- An "Associate Member" refers to all Individuals who are indirectly involved or interested in the promotion of the Digital Economy and the local Technopreneurial industry and includes Venture Capitalists, Investors, Educationists, Government or Semi-Government personnel, personnel of Non-Governmental bodies and other interested parties as determined by the Council from time to time.
- An "Honorary Member" means Individuals who have made a significant contribution to the Digital Economy, leaders of the Information and Communications Technology and the Technology industry as well as those whose experience and guidance have promoted the local Technopreneurial spirit.
- A "Student Member" means registered students of Institutions of Higher Learning pursuing a Diploma, Degree or Postgraduate qualification related to the Digital Economy.

Among the aims for which the Association is established, there are:

- To provide an organised and unified voice and to advance the interests and well being of local Technopreneurs.
- To provide means for considering questions affecting Technopreneurs and to initiate, watch over, petition and take whatever action as may seem desirable in relation to legislative or other measures affecting Technopreneurs and the Digital Economy.
- To establish a liaison and to co-operate with government departments and educational and other appropriate institutions or bodies both national and otherwise concerned with or interested in the development of Technopreneurs.

Exhibit 2.11 continued

Mentor Program

The Mentor Program is designed to give participants the opportunity to receive guidance and advice from a pre-assigned 'mentor' for a period of one year. For the purpose of this program, a year will consist of 4 group meetings with the mentor and will be heretofore classified as "a cycle" and will last approximately 10–12 months. Mentors will be requested to attend meetings and give guidance and advice to participants on the specific functional area to which they are charged. Mentors may also provide guidance and advice through responses to the e-mail or discussion board queries of the participants in their assigned group.

Source: www.technopreneurs.net.my

What does technopreneurship really mean? To answer this question the characteristics of the founders of technology-based firms (TBFs) must be analysed. They appear to be:

- Familiarity with the academic world.
- Seizing opportunities for launching start-ups in technologically progressive new firms enjoying sustained fast growth, mostly in the fields of ICT, electronics, computers and software, biotechnology, life sciences, and environmental technologies.
- A technical-biased culture pushing their ventures into a tiny niche market where the survival rate is low.
- Lack of a business vision and inadequate knowledge of competitive forces in the market.

Findings such as those exhibited in Table 2.6 corroborate the traits sketched above.

Table 2.6

Technology entrepreneurship in the software industry of Campania region, Italy

- **Conditions for start-up.**

Technology discontinuity and high market growth rate.

- **Type of founder.**

Academics, graduate, individual with academic experience.

- **Culture of the entrepreneur.**

Technical.

- **Type of market.**

Niche.

- **Survival rate.**

Low.

- **Conditions for survival and growth.**

Acquisition of managerial competencies.

- **Conditions for escaping the niche boundaries.**

Relationships with large firms and reinforcing relationships with the technical environment.

Source: Adapted from Bellini, Zollo, 1997.

Besides, a survey, which was made in the field of ICT start-ups under the umbrella of the Dutch Twinning Scheme (Exhibit 2.10), suggests that TBFs suffer from a marketing and sales gap (Table 2.7) that hampers the transformation of innovative technology into marketable innovation. This concern has been highlighted by a focus group project carried out in Europe by the International Association of Science Parks (IASP). Support to marketing and sales, not research activities, heads the list of the attributes that motivate TBFs to remain in a science park (IASP, 1998). The importance of the 'ecology' of the business environment in which these companies are situated thereby increases considerably.

Table 2.7

Needs for marketing and sales services relative to technology services perceived by potential entrepreneurs, starters and growers (needs for technology services = 100)

	Potential entrepreneurs	Starters	Growers
Perceived needs	230	175	154
Needs not met		470	200

Source: *Netherlands's ICT Twinning Centres and Investment Funds*, Booz-Allen & Hamilton and Ministry of Economic Affairs.

Hence the conditions for survival and growth of technology-based entrepreneurship are heavily influenced by the techno-preneur's attainment of managerial competencies, his or her networking capability in the business environment and, in particular, the development of both market relationships and embedded ties (i.e., close or special relationships) with large companies.

Geoffrey Moore (1999), Chairman of the Chasm Group and a venture partner at Mohr, Davidow Ventures, has drawn up a model that has much to say about forward signals that help technopreneurs to bridge the gap or "chasm" between early adopters of a new-brand technology and pragmatic buyers in order to reach the lucrative mainstream market (Figure 2.7).

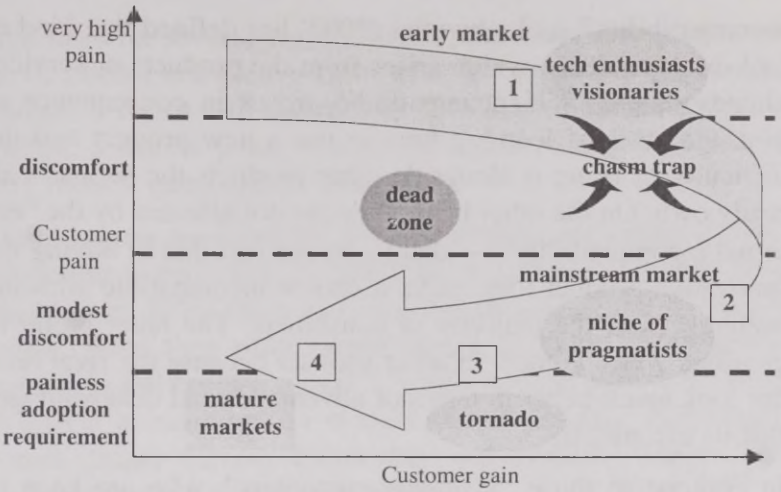


Figure 2.7. Moore's model of technology adoption life cycle.

Source: Adapted from Moore, 1999.

Technology-based start-ups strive to create high-tech products tied to the spirit and culture of their potential buyers. So, the solutions they offer have to be not only functional and convenient, but also stylish and attractive. In doing so, they need early adopters gaining experience from those solutions. Since most novel technologies — Moore argues — can offer only partial solutions, a new market, he further states, can be disclosed only by enthusiasts or visionary customers — that is, by early adopters ready to accept a very high pain in exchange for a very high gain provoked by an innovative but imperfect response to their requirements. Early adopters overcome "self-

> *Technopreneurs' products must be functional material objects and they must appeal to the human spirit.*
>
> *In this sense, one can say that technopreneurs operate in a culture industry.*
>
> *(Moritani,1982)*

incompatibility", as Liebwotitz (2002) has defined that kind of lock-in dependence which arises from the products or services already in use. Self-incompatibility arises in consequence of both the costs of learning how to use a new product and the difficulty of using it alongside other products the adopters already own. On the other hand, they are not affected by the "external incompatibility" — that is, by the fact that in buying the innovative product they make a choice incompatible with the preferences of the majority of consumers. The latter prefer to continue with the most familiar product because the rival does not look much better in terms of advantages and disadvantages that its use entails.

In contrast to those "visionary customers", who are keen to make a quantum leap forward, pragmatic buyers constitute the early majority looking ing for such an improvement in the new product that makes it a complete solution through which they can get a very high gain while suffering only a modest distress. The vendor, who fails to get the remaining x percent in order to deliver a whole product, will be falling into an abyss. Technopreneurs, therefore, have to be very attentive in decoding the signals transmitted by the pragmatic buyers "who look to each other for guidance during the chasm phase": if "no one like them is adopting, so they too hold back" — Moore maintains. Correctly interpreting those signals means that technopreneurs have been focusing on a niche of pragmatists as a chasm-crossing mechanism.

"Visionary customers" and "pragmatists" are comparable to lighthouse keepers who, by means of gain (green light) and discomfort (red light) innovative products and services cause them, transmit signals to technopreneurs navigating in technology markets.

Once in the mainstream market, those technology-based start-ups committed to make available a painless adoption with a high gain, can capture the benefits of the market take-off: what Moore calls the "tornado of an hypergrowth phase at triple-

digit rates for several years". Finally, the innovative product or service being completely successful (a "must-have" item), the tornado's vortex will change into the calm of a mass-adoption market: a mature phase that rewards customers with a pair of very modest gains and no discomfort.

Many vessels are expected to be in trouble navigating in such dangerous waters. Not only the bulk of new ventures fall into a chasm trap. Even those crossing the chasm can hit the sand-banks. What they offer might appear attractive to would-be customers but not still a must. Overall, a small gain will accrue to buyers in exchange for modest pain. In a "dead zone" companies cannot survive. Either they endeavour to change their current course or go out of business.

Today's technopreneurs resemble a modern day Candide in search of the best-of-all possible worlds. They place emphasis on the upsurge of markets that compensate buyers with very high gain and no distress. How many technology-based start-ups will be keeping or breaking their promises depends on the mode of navigation in the dangerous waters vividly traced in Moore's model.

10. CREATIVITY IN BUSINESS

Innovation is not about contrivances or artifices that replace human intelligence and creativity. "The more I look at human beings — Mike Cooley has asserted —, the more impressed I become with the vast bands of intelligence they can use" (Cooley, 1987).

Creativity has been defined as "imaginative processes with outcomes that are original and of value" (Withehead, Wright, 2002). Creativity in business has to do with the generation of new ideas that are converted into economic activity. Therefore, creative thinking needs to be supported by a strong culture of commercialisation. Once a new thought has been developed, it

must be validated, then a prototype offering has to be created, the competitive environment assessed, the offering tested, feedback used to refine the offering, a business plan tightly constructed and executed when the new entrepreneur is ready to seek outside investors (see Table 2.16 in this Chapter).

A complementary perspective is displayed in the title of a famous lecture by Akio Morita, the Sony's founder, at the Royal Society in London, in 1992: *'S'* [Science] *does not equal 'T'* [Technology] *and 'T' does not equal 'I'*. Morita spoke eloquently about the difference: "just having innovative technology — he argued — is not enough to claim true innovation". True innovation is made up of three key elements which Morita call the "three creativities": creativity in technology, and creativity in product planning and marketing as well.

10.1. CREATIVITY

Contrary to the common belief, creativity in technology, or technological clairvoyance, is far from enabling technology entrepreneurs to succeed.

Technology, even a good one, does not sell itself.

"Creativity in product planning — argued Morita in that lecture — is so important, though many do not seem to recognise this... What difference does it make how fantastic and innovative your technology is if you do not have the ability to design a useful, attractive, 'user-friendly' product? Videotape recording technology was first introduced to the consumer market in 1965, but the home video market was not born until 1975. That was when innovative product planners took the tape out of the reels and

Innovation may not be particularly profound in a technological sense — indeed, it often relies on off-the-shelf components.

(Christensen, 1997)

put it into a convenient Betamax cassette for home use. Creativity in marketing also cannot be overlooked. Again, if you have great technology and even a great product, you will only find success if the market is 'ready' to welcome your product". Borrowing an example from Sony's history, Morita made reference to the case of the Walkman. He submitted that "many have called it an innovative marvel, but where is the technology? [All components to make it were already available on the shelves]. Frankly, it did not contain any breakthrough technology. Its success was built on product planning and marketing" (Morita, 1992).

So, however dazzling the technology may prove to be, addressing the right window of opportunity into the marketplace will be the dynamo powering technology entrepreneurs to international pre-eminence. By implication, the technopreneur must be endowed with perception of the significance and nature of events before they have occurred, care in providing for the future and the ability to look forward: in one word, he needs foresight. Technopreneurs who are lacking in such foresight are "Men who learn only through suffering" — as Demosthenes warned in his work *On the Trierarchic Crown*.

The progress in business knowledge is relevant as much as developments of science and technology.

The technopreneur's *modus operandi* consists precisely in combining the Morita's "three creativities". How it can happen is represented in Figure 2.8 where four different situations emerge from the intensity of both the technology impact and the market impact caused by a given innovation on the company to which it is coupled. In turn, the company is articulated in 6 regions of business knowledge: i.e., the core competence or domain expertise (i.e., what the company is good at — see region 1), known unknowns (region 2) and unknown unknowns (region 3) near the core competence, knowledge of the

current competitors (region 4), knowledge of outsiders as potential invaders (region 5), and perception of original technologies from today's new scientific discoveries that can turn into tomorrow's markets (region 6).

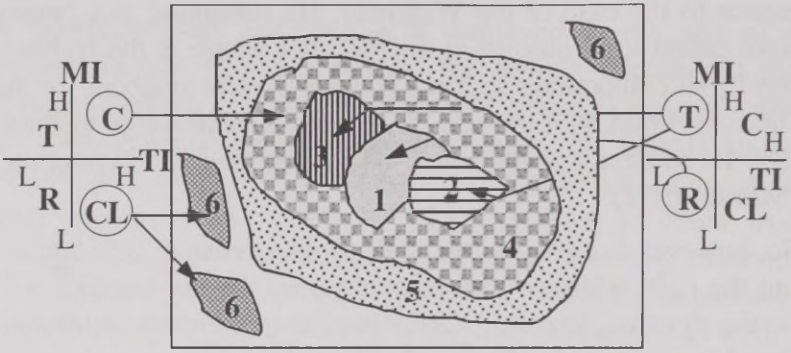


Figure 2.8. A conceptual map to discern creativity in business.

MI: market impact; TI: technology impact; L: low impact; H: high impact. C: creativity — high market impact and high technology impact. CL: clearvoyance (far-seeing) — high technology impact and low market impact. T: time-to-market — high market impact and low technology impact. R: routine — low market impact and low technology impact.

1: core competence or domain expertise; 2: known unknowns; 3: unknown unknowns; 4: today's competitors; 5: potential invaders; 6: 'technology islands'.

A disruptive innovation is an innovation that sweeps away the traditional competitors whose products or services are hit by irreversible obsolescence.

Creativity occurs when both technology impact and market impact are high (see quadrant 'C' in Figure 2.8). In one respect, the introduction of disruptive innovation that comes from creativity breaks the rules that have been governing region 4 and, from

another point of view, pre-empts attacks from outsiders in region 5. Thus creativity inflicts major changes on the core competence or even induces the abandonment of what the company until then thought it was good at.

10.2. CLAIRVOYANCE

Unlike creativity, clairvoyance (quadrant 'CL' in Figure 2.8) is a distinctive trait of 'pure' scientists and researchers who look ahead, beyond the frontier of the known domain. A prevailing sentiment of a 'manifest destiny' nurtured by a gambling spirit and a rugged individualism urge them to traverse the Pillar of Hercules beyond the frontier of the today's world of knowledge. Their free (from money-making) exercise of creativity helps establish pioneer settlements at the extreme borders of the business world. These are 'technology islands' (region 6 in Figure 2.8) whose time is not yet ripe for their commercial exploitation. That KCs are about business and not science explains why they are focused on technopreneurs rather than on far-sighted personalities.

Clairvoyance exhales a flavour of science. Creativity secretes a business touch of geniality. 'Pure' scientists and researchers yearn to go beyond the utmost limits of the current knowledge domain. They have a long-term commitment to solve problems which appear impossibile.

Technopreneurs are willing to make the customers aware of new commercial opportunities that stretch beyond their current requirements.

There is a subtle point at issue that descends from clairvoyance — that is, how research is to be exploited. If industry is considered a customer that seeks specific deliverables, then exploitation implies applied research contracts with industry. In turn, this means that the transfer process is a onetime handout process from the research originator and supplier (re-

search centres and their laboratories) to the developer (industrial client). Eventually, a 'lubricant' in the form of a broker or interface might speed up the transfer process (Mitra, Formica, 1997: 22). Conversely, if industry is considered a 'patron' demanding excellence, motivations to research transfer (Table 2.8) become more important than modalities. The aim is to do research in areas of interest to business (i.e., 'applicable' research).

Pure research is discovery; basic research is the understanding of the mechanism of discovery; applied research is the investigation of the economic utilisation of discovery, and development is the exploitation of discovery.

Transfer of research means transfer of new technologies (technology transfer), transfer of information to markets (information transfer), transfer of younger specialised personnel (personnel transfer).

Table 2.8

Key principles of 'motivation' to the transfer of research

• The lubrication of the transfer channel is not capable by itself to accelerate the process in the absence of driving forces. The process is driven by the demand rather than the supply.
• The demand of innovative products and services is the driving force for entrepreneurs to invest in research: a general criterion should be to pull the innovation rather than to push it.
• To accelerate the transfer, it is necessary that the receivers be strongly motivated and in close contact with their markets. They must also be capable of assimilating the research they receive. A good educational and training system (here) is a high-priority.

- The cost of introducing a new technology is far greater than the transfer price of it, and is connected to the changes of the firm's organisational structures and strategic assets that usually come together with the adoption of a new technology.

Source: Adapted from Nicolò, 1996.

Companies would be ready to invest to acquire insight and understanding of research once their capacity to assimilate advances in research were reinforced by entering into meaningful dialogue with research institutions. The linear model of transferring with its underlying law of unidirectional causality is replaced by the law of circular causality. Non-linear feedback loops link research to industrial innovation. A spiral model with a reverse flow from industry to research (Figure 2.9) enhances the performance of the latter[12] — which contributes in turn to amplify the virtuous cycle (Etzkowitz, 1996).

Invention teams are knowledge pools, whose participants are accustomed to working together by following a Faraday-style behaviour, for which "applied goals also tackle the basics".

In the context of a market-driven transfer process (Exhibit 2.12), researchers, business strategists and patent experts coalesce in 'invention teams'. Each team looks like a research enterprise the 'product' of which is a specific project with a

[12] According to Etzkowitz, 1996, "survey data showing that academics with industrial connections publish more than their peers lacking such connections, indirectly support this thesis".

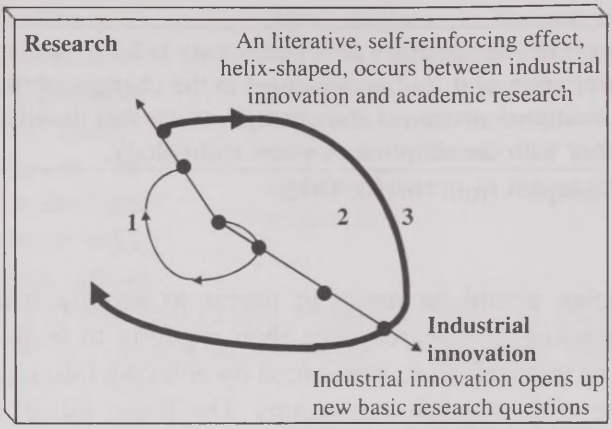


Figure 2.9. Circular causality in the research domain.

limited lifetime (say, five years), unlike the bureaucracy of the conventional, age old research institutes and laboratories where research projects often drag on for decades. At the end of the period, the project is discontinued and a new one with an entirely fresh team will take its place.

Exhibit 2.12

The Baden Württemberg market-driven transfer process

Transfer is primarily a market-driven process of specific projects. Business motivation for transfer is the key element of the process.

The educational and training system of training is an effective provider of highly skilled industrial workers. The region is endowed with first rate educational, R&D (private and public) and technological infrastructures: 9 universities; 23 technical schools (Fachhochschulen); 14 Max Plank Institutes; 14 Fraunhofer-Gesellschaft Institutes; the Steinbeis Foundation with 160 Technology Transfer Centres; 6 university foundations; 87 researchers out of 10 000 inhabitants in BW.

Exhibit 2.12 continued

The regional economy is reinforced by a set of general (infrastructural) and specific (technological) Land government policies. A variety of institutions operate for the promotion, assistance and supply of services to SMEs.

Large and small firms realise that to "maintain their own autonomy in the system they must accept their dependence on the system". Co-operative and competitive relationships depend on the firm's awareness of the limits of its proprietary know-how and are backed by practises of mutual respect and trust.

Out of about 2 500 people involved in the Steinbeis Foundation, only a small part are employed directly by the Foudation and on a full-time base. 90% of them are engaged in connection with specific research contracts and specific technology transfer projects. The focus on the market allows the financial autonomy of the Foundation (93% of the budget is covered by market revenues).

10.3. TIME-TO-MARKET AND ROUTINE

Technopreneurs uncover new business developments that need fresh resources either in money (e.g., risk capital) or in kind (e.g., human capital — that is, knowledge and competencies to provide solutions for customers). Time-to-market and routine help current businesses release resources to be employed in new ven-

Time-to-market encompasses the notion of going the pace in the introduction of product or service innovation improvements to the marketplace. Routine is the ability to work with method to gain in efficiency. Compared to routine, time-to-market can have a larger effect on profit than on product cost.

tures. In fact, by the action of monitoring gaps that are known (e.g., articulated user needs) and discovering unknown drawbacks (such as, the behavioural needs of potential customers), time-to-market contributes to go more quickly and more effectively to markets with product or service innovation improvements resulting from ready-to-use technologies (see quadrant 'T' and regions 2 and 3 in Figure 2.8).

Routine, on the other hand, enables constant advancements through continuous improvements upon existing models (see quadrant 'R'and region 1). Unlike ICs whose business players thrive to make their core competencies shiny, KC players are engaged in softening them so as they can embrace creativity in business. Time-to-market and routine are the threads that connect efforts ICs make to get success from advancements within the core competencies to the resolution with which KCs carry on the building of a new business order.

> *Improvement is not innovation.*
>
> *Improvement is about the amelioration of the status quo; innovation is about the disruption of the current state-of-the-art, doing something in an entirely different way.*
>
> *(Horibe, 2002)*

11. MATCHING ENTREPRENEURIAL CAPACITY AND OPPORTUNITIES

Entrepreneurship flourishes at the crossroads where entrepreneurial capacity meets entrepreneurial opportunities. To take advantage of an opportunity (that is, to transform a possibility into a business reality), individual commitment and capability are primary conditions. Commitment implies motivation, and capability calls for entrepreneurial attributes. Therefore, the entrepreneurial capacity embraces motivations and attributes, as shown in Table 2.9.

Table 2.9

Entrepreneurial capacity

Motivations
• Capacity to think for oneself.
• Self-confidence.
• Sense of autonomy, independence and risk-taking.
• Intense emotions.
Entrepreneurial attributes
• Clarity of leadership.
• Openness and inquisitiveness that stimulates innovation and learning.
• Creation of new value or organisational capability.
• Flexibility to change.
• Relationship building skills.
• Ability to convince others (employees, individual investors, suppliers, and landlords) to share start-up risks.

Should the availability of entrepreneurial capacity exceed opportunities, unfulfilled expectations would discourage an otherwise positive attitude towards entrepreneurship. Similarly, entrepreneurial opportunities in excess of capacity will not generate commercial outcomes. Both imbalances depress the level of entrepreneurial activity. Consequently, the growth of entrepreneurship is the product of a three-pronged strategy:

- developing entrepreneurial capacity;
- cultivating and detecting entrepreneurial opportunities;
- and raising the level of equilibrium between entrepreneurial capacity and opportunities from the creation of small firms to that of entrepreneurial growth companies (Figure 2.10).

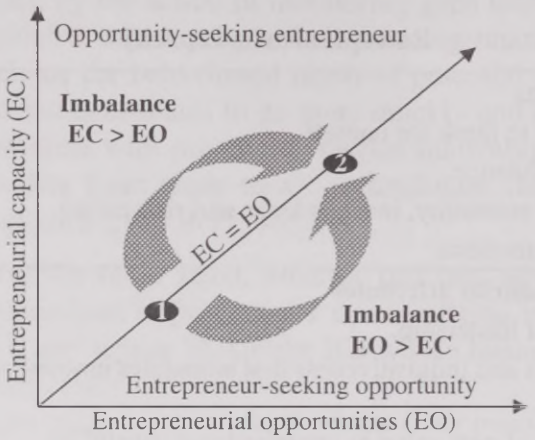


Figure 2.10. Matching entrepreneurial capacity and entrepreneurial opportunities.

1 — small business creation; 2 — entrepreneurial growth companies.

Instrumental in the improvement of entrepreneurial activity, in terms of the level as well as the quality of entrepreneurship, is the adoption of a business development methodology (BDM) that drives entrepreneurial capability and opportunities towards the desired target. The BDM is a knowledge tool that keeps ideas flowing into rapidly growing start-ups. The methodology is designed to provide for a tight linkage between entrepreneurial capacity and entrepreneurial opportunities.

Entrepreneurship can be represented as a puzzle whose main pieces are training and education, research, application, production, marketing and sales. Whereas each one of the actors involved in it seems to master a single piece of activity, the BDM embraces the entrepreneurial landscape as a whole. In particular, the methodology explores intensity and quality of interdependence among the different communities of practice and knowledge pools that populate a knowledge cluster and

extracts the value of the whole in addition to the operations of individual parts (Figure 2.11). This activity is scarcely conceivable in ICs where the business community and the academic world are not aware of their respective advances.

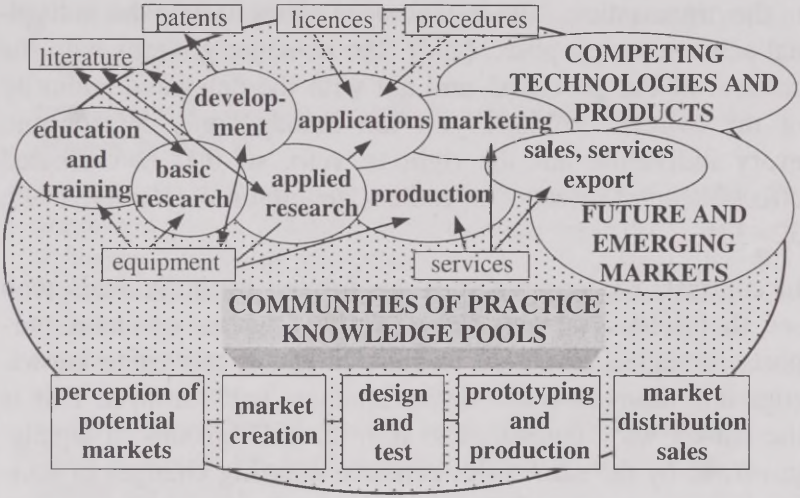


Figure 2.11. Business development methodology.

12. EDUCATION AND ENTREPRENEURSHIP

In comparison with ICs, KCs have a different perception of advances in the universities and other higher education institutions. IC business communities confine their interest to selected professors or researchers as providers of services for which SMEs bid. The blatant disregard toward the academic institution *per se* is due to the presence of invisible walls surrounding the university. In particular, 'job for life' (tenure) at the university is incompatible with the competitive environment at company level, and the academia's 'dionysian' (existential) culture conflicts with the role or the task culture of the firm (Handy, 1995).

The players in ICs are privately owned, often family-run small businesses and family-controlled groups, and are governed by the rule of the authority and delegation under the jurisdiction of the leader. Conversely, in the realm of education — as Charles Handy has noted — the individual is not subordinate to the organisation, "the organisation exists to help the individual achieve his purpose.. [and] "the manager governs with the consent of the governed, and not with the delegated authority of the owners... Where you can manage only by consent, every individual has the right to veto, so that co-ordinated effort becomes a matter of endless negotiation" (Handy, 1995: 32– 33).

In contrast, KC communities are formed by individuals who see themselves as knowledge workers whose common purpose, as suggested earlier in these pages, is to change knowledge into innovation and derive business value from it. This is the reason why, compared to ICs, the KC 'groups of equals' governed by the same rules perceive amazing changes in society in consequence of the advances in the educational sector. They notice that this sector is one of the most dynamic areas in business and are pledged to turn the mere task of providing services to business organisations into a more ambitious and fulfilling mission: namely, that of treating education as the new fast-growing industry of the 21st century.

A 40% increase in student numbers in tertiary education is expected over the current decade. The traditional 18–24 year-old students, who traditionally have been the primary focus of colleges and universities, no longer represent the majority in the education market. The future belongs to the non-traditional working adult students. The explosion of online distance education enables organisations to foster an 'anytime, anywhere' learning scenario. Students who choose to study and live abroad are rapidly increasing. Across OECD countries there are about 1.5 million foreign students, 44% of them from Asia

and 31% from Europe (Exhibit 2.13). Although education is still on the whole publicly funded, private spending is increasingly important and now accounts for, on average, 9% of initial educational funds.

Exhibit 2.13

International mobility of tertiary education students, according to OECD

Amidst a general trend towards freely circulating capital, goods and people, individuals are also looking more closely at foreign institutions for tertiary education. In 2000, according to available data, 1.6 million foreign students were enrolled in tertiary-level institutions outside their country of origin. Of these, 1.5 million were studying in OECD countries, an increase of 14% compared with two years previously, with numbers of students from other OECD countries rising at around the same rate as numbers of students from outside the OECD.

China accounted for the largest share of foreign students studying in OECD countries, with 7.1% of the total. Among OECD countries, students from Japan and Korea comprised the largest groups, at 4.6% and 3.9% respectively, followed by Greece (3.6%), Germany (3.5%), France (3.4%) and Italy (2.7%). India was the second largest non-OECD provider of foreign students after China, with 3.4% of the total, followed by Morocco (2.7%) and Malaysia (2.4%).

A handful of host countries has capitalised on this interest in cross-border educational services, with the U.S. hosting 28% of these foreign students, followed by the U.K. with 14%. Germany, France and Australia were also high on the list of destinations for foreign students.

Source: *University Education Produces Measurably High Returns for Students, According to OECD*, OECD News release, 29 October 2002.

A better educated population is expected to have a positive impact on entrepreneurship. Today's customers, more demanding than those of the past, call for customised and knowledge-intensive products and services. The development of such products, in terms both of technology and marketing, require entrepreneurial people with a higher degree of education and training. Thus education, in particular tertiary education, plays a key role in fostering entrepreneurship. Indeed, statistical evidence suggests that the greater a country's investment in tertiary education, the higher the rate of new firm formation. Entrepreneurial economies — that is, those with a high rate of new company formation — exhibit better macroeconomic performance (see *Global Entrepreneurship Monitor* — http://www.ncoe.org/research/index.html).

Yet, there is a disconnection between the current trend in education and the state-of-the-art of education and training necessary for raising awareness of entrepreneurship and preparing aspiring entrepreneurs. Business schools all over Europe, North America and Asia report an acute shortage of academics who are capable of teaching entrepreneurship (Reynolds, Hay, Camp, 1999). This deficit seems even more critical in the light of the barriers raised by widely held misconceptions about entrepreneurship that permeate society and government.

The educational system has to be oriented toward "doing" more than "thinking". Knowledge has to be converted into solutions that benefit customers in the marketplace, and scientific and technological education should include management training to enhance the commercialisation of new developments.

13. CRAFTING THE ENTREPRENEURIAL ROLE

It is often claimed that 'entrepreneurs are born, not made'. However, education is critical if the appropriate level of knowledge and competencies required to perform the entrepreneurial role is to be attained. This does not mean that the would-be entrepreneur has to be an experienced expert in one specific field. He or she ought to be confronted with the types of issues the entrepreneur encounters daily. Instead of being taught about and around separate pieces of a business puzzle, the would-be entrepreneur needs to acquire the total understanding of entrepreneurship.

A good idea is only the starting point of a process that converts the idea into practice. Learning how ideas are created, how unexpected opportunities are grasped, applied and commercialised, and how a company is established, enables the would-be entrepreneur to turn ideas into marketable products and services by means of a viable enterprise.

"I do, therefore I am" and "every paper I write, every thought I have, I'm thinking about my business" are basic principles to be applied to the learning process for crafting the entrepreneurial role. Giving students first-hand and high-touch experience in creating and running a business is the sound translation of those principles. In terms of the student's success or failure, what happens in his business from a practical point of view becomes far more important than what happens in the classroom from a conceptual perspective.

In this paragraph, what follows is a short description of how entrepreneurship is instigated in the diverse context of ICs and KCs.

In Chapter 1 we have portrayed the IC configuration as a dense fabric of SMEs emerging from a long-lasting, spontaneous phenomenon of new business creation by employees leaving

their employers to set up their own companies for opening up new market segments within the same technology domain. The spin-ee is a former employee of a mother-company (the spinner) where he has been covering for years specialised functions of a supplier-type. The new entrepreneur's family and his old-boy network act as business angels. So does the mother-company, providing 'in kind' support in terms of order, advice, client introduction, equipment and machinery utilisation, and a minority stake in the new firm.

The potential of co-operation embodied in this practice of outsourcing has made the 'spinner-spinee' relationship a friendly vehicle for technology transfer along the supply chain. Besides, spin-ees have contributed to raise the parent company's awareness of its own deficiencies (that is, known and unknown unknows in the regions 2 and 3 of Figure 2.8).

Local communities, especially those in close proximity to ICs and in business relations with them, barely endowed with an entrepreneurial culture and whose entrepreneurial mesh is sparse, have been trying hard to gain a foothold on the economic-growth ladder by encouraging this kind of company formation. By the mid-1990s, a forerunner of this movement has been the community of Faenza in Italy, a town of 54 000 inhabitants situated 30 miles east from Bologna, where the town council launched a programme for entrepreneurship, termed "programmed spin-offs" (Exhibit 2.14). Parties involved in setting up and implementing the programme were the City Council, locally-rooted SMEs, a vocational training centre and a commercial bank. Their contributions to the programme and mutual relationships are detailed in Figure 2.12.

Exhibit 2.14

Inducement to entrepreneurship: The case of the community of Faenza in Italy

The town has an outstanding tradition in the production of glazed earthenware since the Renaissance, and the ceramics sector is still one of the vital hubs of the economic and cultural life of her community. In this sector the local economic fabric is characterised by micro firms (very small handicraft workshops that normally employ one or two people) engaged in goods-in-process for third parties. The increasing demand for specialised services (such as the production of special handmade decorations for ceramic tiles) on the part of the ceramics industry is largely satisfied by SMEs located in the industrial district of Sassuolo (about 65 miles from Faenza), which is the biggest world producer of ceramic tiles. Benefits accrued from the work developed by the Faenza micro phase-firms are mostly retained by the Sassuolo leading primes. Moreover, the growth process of Faenza micro and small firms is hampered by the lack of a cohesive industrial fabric in terms of upstream and downstream suppliers, as well as in terms of horizontal collaboration.

This unsatisfactory state-of-the-art has suggested the Faenza City Council to design and implement a programme for boosting entrepreneurship. At the core of the strategy there has been a process of technology transfer from existing companies to start-ups founded by new and young entrepreneurs who come out from "programmed spin-offs", which, in turn, are the outlet of an entrepreneurial course based on vocational training.

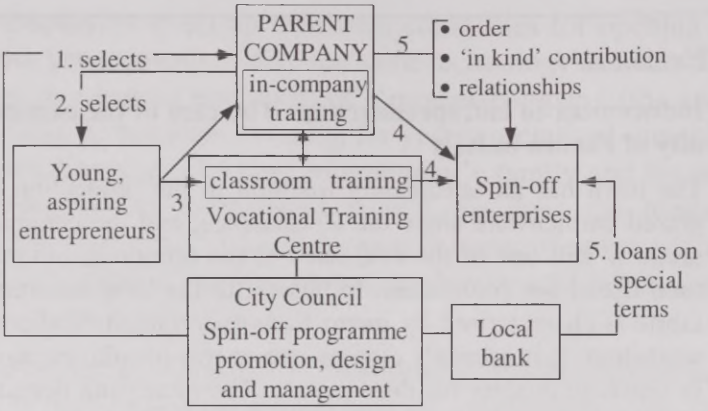


Figure 2.12. Instigating entrepreneurship by means of policy intervention in the IC context: The case of the community of Faenza in Italy.

That few companies have been created and all inside the small-business typology is attributable to the culture of the institutions involved. These institutions are the incumbents who suffers from a sort of 'community anorexia' that prevents them from 'eating' food for thought alien to their collected experience, which resides at the top of the community's establishment. In other words, the 'tyranny of seniority' we have been referring to in Chapter 1 strangles the rise and spread of broader and fresher insights of newcomers.

Entrepreneurship is usually ignited by a bottom-up imagination rather than a top-down experience.

It is only a matter of time before the incumbents become obstacles to creative effort. Therefore, the local community is unable to forge business entrepreneurism on the anvil of innovative solutions that would profoundly affect entire industries such as education and banks. An equally compelling argument derives from the observation that in the IC context vocational training centres and local banks are good at grappling with everyday problems of the existing companies. Col-

laborative programmes, conducive to entrepreneurship, lie outside their primary scope. Although they take part in those programmes, their contribution mirrors both the collected experience already pointed out and the dead weight which lies heavy on their day to day business.

By comparison, in the KC context new forms of collective imagination and intelligence develop, based on knowledge pools, which think up innovative solutions for breeding a new generation of entrepreneurs first and foremost as founders of fast-growing enterprises. Whole new genres of experiences referable to KCs are illustrated in a few examples below.

Collective imagination and intelligence rather than collected experience succeed in building an entrepreneurial community.

In the Foundation Management Experience (FME) Program at the Babson College each participant is assigned to "a small group of their peers and given $ 3 000 in start-up capital to run a business. The group gets together and thinks about what product or service they can provide that will be profitable. They write job descriptions, develop a business plan, create marketing strategies".[13]

In Europe, the University of Twente has been a pioneer in conceiving and developing entrepreneurship education. At its Centre of Innovative Entrepreneurship, graduates are trained how to become entrepreneurs. University research groups offer a part-time position for one year to a graduate who has to develop a business plan in order to be accepted for a place on the programme. The would-be entrepreneur works half time

[13] The National Commission on Entrepreneurship, NCOE Update, 10 July 2001, No 34.

for the research group on contracted research projects and for the remainder he is free to develop his product or service, or to work on first orders from clients. On the other hand, an experienced entrepreneur ("mentor") is asked to support the new entrepreneur, during the first year, in management issues. This service is provided free of charge. After the first year the mentor tends to stay with the entrepreneur on a consultancy basis. The new entrepreneurs change the results of their scientific research at the university site into applicable technologies and marketable products or services.

Peer group promotion forms part of the practice in entrepreneurial skills developed at the UK's University of Nottingham Institute for Enterprise and Innovation (UNIEI). UNIEI is engaged in entrepreneurship projects that require students to work in small groups (normally 3 per group) affiliated to a company with a real problem that requires a solution. The group may work at the company or remain at the University. The company provides the necessary access to the information required to address the problem and establishes an in-house supervisor. The outcome of this activity is a report written by the team and a presentation of its findings.

In the case of the Master in Entrepreneurship at the International University of Entrepreneurship (IUE) in Amsterdam, the student group is turned into an international learning network. A worldwide range of educational and business partners endows the programme with the image of a collegiate community of practice. This is a learning network of cross-functional expertise.

The OECD says that "talent is disseminated most easily through the physical movement of people... the international mobility of students is crucial in deciding which countries are most likely to take advantage of new ideas". The international mobility of talented youngsters helps countries, regions and other territorial communities to close their productivity gap

since it promotes entrepreneurship-led innovation, thereby creating 'nations of entrepreneurs' (Liikanen, 2001). The universal nature of such development also reduces the risk of a talent drain from less developed economies, a potential problem for those economies (OECD, 2002).

The loss of talented youngsters and highly qualified workers is currently a most important phenomenon that could provoke lasting economic repercussions in the countries affected by a brain drain.

Following the OECD's recommendation, the IUE encourages its students, with their different national and cultural backgrounds, to move from one 'learning location' to another in the network, adding the value of the whole to the tasks pursued at the partnership sites. In each location, local professors do most of the teaching to ensure both an understanding of the local culture and customisation of the programmes. Thanks to mobility within the network, informal circles of exchange are formed. These circles are sources of creativity and the cross-fertilisation of ideas. Almost every piece of information the participant needs to start his or her own business can be obtained from the network.

International networks with regional hubs are at the heart of the strategy pursued by the Enterprise Research and Development Centre (ERDC) of the University of Central England in Birmingham, UK. The ERDC's role as a regional hub is "supported by extensive stakeholding relationships and partnerships with government and industry". Within this framework, the ERDC has designed an Entrepreneurship Development Project Model that addresses "three key stages of the development of entrepreneurship practice — detection and ideas generation, codification and rationalisation', and delivery and implementation" (Mitra, Matlay, 2000).

In Israel, the Technion-Israel Institute of Technology, the country's oldest university, established in 1924, and principal

institute for engineering sciences, gives birth to campus companies ("Technion companies") in co-operation with strategic industrial partners and venture capitalists around the world. The Institute might retain a (major) stake in the firms for a while. Once nurtured, the start-ups are sold.

As a final example, New Zealand's Waikato Management School has launched an 'active' business venture programme for "building a real company in real time". In collaboration with existing companies, teams of Waikato MBA students design and develop new spin-off business ventures. Students and staff hold a minority equity share in the new venture and have a seat on its board.

14. ENTREPRENEURIAL UNIVERSITIES

There is one underestimated ingredient in the recipe for the success of innovation strategies — that is the innovation of the agents who stimulate innovation. Universities have a crucial role to play in this process.

There are knowledge pools, formed by individuals from the business community, universities, higher education institutions and public research bodies, that design and manage activities (such as those listed in Table 2.10) necessary to build a new enterprise economy. In so doing, they behave in such a way as their counterparts did more than nine centuries earlier when, in the year 1088, the major educational innovation of the second millennium, known as "an academic university" was founded in Bologna. Indeed, those activities resulted in the creation of innovative organisations for education, termed "entrepreneurial universities".

Table 2.10

Activities generated by knowledge pools to build a new enterprise economy

Elaboration of programs that meet the needs of the knowledge cluster community, with emphasis placed on the retention and placement of college graduates, and on the sharing of information about prospective jobs to students. Examples are: • Defining the range of professional competencies and skills for managing the innovation process. • Shaping innovative approaches for vocational education (programs need to be state-of-the-art and responsive to industry in the region). • Developing educational curricula to train students and prepare graduates to exploit their own patents and to set up their own business. • Developing monographic courses addressed to technicians, front-line and top managers. • Acting as 'professional professors', thereby bringing into the education environment brains from industrial and consultant backgrounds to strengthen the quality taught programs through the integration of them with academics.
Promotion of spin-off companies by students, graduates, professors, researchers, and other people: • Firms set up by the teaching or research staff of university, who wish to exploit commercially the results of research conducted in academic environments. • Firms founded by graduates and students to exploit commercially the results of research in which they have been involved at the institution. • Firms run by persons from outside the university, who decide to exploit commercially the results of academic research.
Commercialisation of technology or a particular kind of knowledge, precursor to technology.

Links with markets that give rise to demands of innovative products or services, which means empowering 'market-led' instead of 'supply-led' technology transfer.
Managing intellectual property rights without undue proprietary restrictions on the dissemination of information.

Better-educated individuals in the field of entrepreneurial capacity increase the potential to start new businesses. Investment in tertiary education ought to be diverted towards innovative educational institutions that allow people to acquire skills they need to recognise and pursue business opportunities. The entrepreneurial universities are the most advanced forms of educational institutions embarking upon a new wave of teaching and learning methodologies in the field of entrepreneurship. Besides, these institutions harvest, in the marketplace, the fruits of university research, capitalise on business development thanks to the know how of professors, researchers, graduates and students, and provokes new company formation in the knowledge-based industries.

According to David Blunkett, the United Kingdom's former Secretary of State for Education, "In the knowledge economy, entrepreneurial universities will be as important as entrepreneurial businesses." In fact, to address the phenomenon of entrepreneurship and accelerate its pace, the most dynamic economies are producing innovative types of social and business models for advanced education.

14.1. THE ORGANISATIONAL DESIGN

The entrepreneurial university can be defined as a fluid network of inter-linked agents performing specific activities and drawing strength and vitality from one another (Table 2.11). They can also be 'unbundled' or 'disaggregated' from one an-

other. This means that the entrepreneurial university is a self-organisation — that is, "a spontaneous formation of interest groups and coalition around specific issues, communication about those issues, co-operation and the formation of consensus on and commitment to a response to those issues". The organisation embraces the attribute of an adaptive system whose agents change rules of conduct as the system evolves (Stacey, 1996: 333).

Table 2.11

Agents of the entrepreneurial university

Degree Granting Bodies (DGBs): small and flexible administrative bodies which deliver degrees and set degree requirements and core courses. One DGB can take on as many or as few students and faculty as thought viable. Their main activities are: • Student orientation: competence oriented rather than diploma-oriented. • Certificates and degrees. • Non-credit programmes. • Caree counseling.
Faculty companies, which are independent contractors looking for DGBs to sanction their teaching. They might find more than one DGB to do this. Their main activities are:
• Lecturing and researching. • Mentoring and tutoring. • Academic counseling.
Facility companies, which make available labs, equipment, libraries, and classrooms. Their clients might be several DGBs.
Incubator companies, engaged in nurturing start-ups from graduates and researchers in co-operation with strategic industrial partners and seed capitalists around the world.

Source: Adapted from Seely Brown, Duguid, 1996.

The self-organised network allows the entrepreneurial university to identify both the different markets or clients that they are serving and the different ways of connecting with and contributing to those markets or clients.

Information and communication technologies are important adjuncts to the network as they contribute to cut down co-ordination costs. But technology is neither a substitute for campus life nor for the entrepreneurial university as a community of scholars (including students and staff)[14]. Indeed, the university ecology produces a collegiate effect between current and past students. It is expected that past students will continue to take part in the activities of the network by means of 'learning contracts' signed by themselves as individuals or by their employers. A further vehicle for keeping them all in touch with the evolution of activities is the ex-alumni committee.

This type of university is the 'natural' partner for companies and people capable of recognising the potential of that market. Large corporations have already tackled the new business, investing in those education ventures called "corporate universities". Ideas and plans conceived for establishing entrepreneurial universities nowadays bring together even small and medium sized companies from diverse sectors to broaden their understanding of the entrepreneurial economy.

14.2. CORPORATE UNIVERSITIES

A distinction must be made between entrepreneurial universities and corporate universities. In the educational landscape,

[14] As for online courses, educational technology specialists worry about the quality of the teacher-student relationship when long-distance education increases. On the other hand, a widely held belief is that computer facilities better than classrooms help customise individually tailored curricula. (Pescovitz, 1996)

the former emerge from the activity of knowledge pools in the area of the entrepreneurial economy, while big companies have been creating the latter with the mission to offer in-house a continual knowledge and learning cycle for their employees. This can be viewed as the growing recognition by many large organisations that, on one hand, the power of knowledge and learning is a fundamental driver of strategic changes while, on the other, world-class corporate universities can have a big impact on the exercise of that power (Prince, Beaver, 2002).

Entrepreneurial universities are embedded in the entrepreneurial economy; corporate universities, in the managed economy.

Over last two decades, large bureaucratic corporations have launched their universities — nowadays they are almost a thousand of them alone in the United States. It is important to note that the term 'corporate university' embraces a diverse range of organisations with and without the word university in their title. A neutral definition is that of "an on-site learning initiative integrating credit and non-credit programs that are linked to organizational missions and goals" (Wells, Barley, 1998). For example, Tapscott reports that McDonald's Hamburger University "provides credit-level education to more than 10 000 employees per year. In 1995 alone, more than 700 000 McDonald's employees received some form of structured training... Employee education is not growing 100% faster than academia, but 100 times — or 10 000% faster" (Tapscott, 1995: 200).

There are corporate universities that perform training functions and others acting as agent "for the management of change through [their] key role in facilitating knowledge management practices and operating the organisation's learning agenda". The latter aspire to the role of world-class corporate universities.

(Prince, Beaver, 2001: 21)

Corporate education initiatives (see Exhibit 2.15 the Infosys's Corporate Learning Initiative) strive to align corporate learning to business strategies, develop strategic learning alliances with external providers, create a learning environment through technology, develop and implement innovative marketing and branding techniques.

Exhibit 2.15

The Infosys's Leadership Institute

"Infosys Technologies Ltd, a Bangalore-based company, is a world leader in consulting and information technology services.

"At the cornerstone of Infosys' Corporate Learning initiative is the Infosys Leadership Institute located in Mysore.

"The Leadership Institute was established to help manage Infosys' growth, prepare Infosys employees ("Infoscions") to face the complexities of the rapidly changing marketplace and bring about a paradigm shift in the work culture by instilling leadership qualities.

"Other components of the Corporate Learning Initiative are the Education & Research and Learning & Development departments, which, along with the Leadership Institute, enable the present and future leaders of Infosys to achieve the company's vision and strategy".

"Infosys exemplifies best practices in corporate learning, incorporating the organization's strategic goals into the learning infrastructure, and creating a learning environment that is aligned to and improves business performance. Infosys Corporate Learning leverages talent and leadership, maximizing through learning, value to their stakeholders — customers, community, board of directors, employees" (official praise from the Corporate University Xchange Excellence Award for 2002 received by Infosys Technologies Ltd).

Source: Infosys Press Release, 7 June 2002.

Throughout its long life cycle the academic community claimed to have a monopoly of knowledge. But in the meantime the business community has realised that, from a historical standpoint, the oldfashioned universities and schools were failing to provide industry with the skills it needs, and, from a business view, that higher and further education is a rising market, with even more demanding customers since ICT infostructures became available.

A renowned institution such as the Massachusetts Institute of Technology has recognised that the relationship between university and industry should not be based on the view that the university is the central source of knowledge, but on the conviction that the new knowledge and discoveries occur throughout society, and that the movement is never unidirectional.

In "A Survey of Universities" The Economist, 4 October 1997, it is suggested that the fashion for companies to establish their own universities "symbolises... the growing elision between the presumed jobs of the university (basic research, general education) and that of the company (applied research, job-specific training). McDonald, Motorola, Sun, Microsystems, Hewlett-Packard, Unipart, British Aerospace are only some of a many initiatives large companies are devoting to business education through corporate universities".

Yet corporate universities do not underrate the role in both education and creation of new knowledge played by the academic institutions and, therefore, they are interested in complementary forms of evolution with them. According to a survey quoted by Financial Times, 16 March 1998, a growing number of corporate universities seem keen to develop complementary relationships with academia (Exhibit 2.16). Partnerships with accredited higher education institutions have been developing

mostly in business administration, computer science, engineering and finance.

Exhibit 2.16

Complementary relationships between corporate universities and academia

"Our [corporate university] role is to be a bridge between the academic world and the business world. It is more and more important for companies to get a fresh infusion of knowledge to manage the permanent transfer of academic knowledge into the company" (Michael Heuser, Head of Lufthansa School on Business in Frankfurt).

"Corporate universities not only have access to the business schools with which they work, but also can tap into the wealth of experience and knowledge inside the corporation — knowledge which is up to the minute and relevant" (Steve Trehern, Vice-president of Unysis University).

"The greatest asset of corporate universities is the daily access they have to senior leadership that allows them to align education programmes with the company's shifting strategic goals... Some corporations have joined with top business schools to create blended corporate degree programmes that offer the best of both world: a high-quality, accredited MBA programme and customised course projects that let employees do real work, not homework" (Thomas Moore, Dean of the executive education at Babson College).

Source: *Business Education*. Financial Times Survey, 25 March 2002.

14.3. CULTURAL ROOTS OF THE ENTREPRENEURIAL UNIVERSITY

The twelfth-century term for a university was *studium* — a community of learning for students where all were welcome. The university of the Middle Ages was a student-run institution. Consumer-students collected fees, paid salaries, issued the working rules, determined the content of the curriculum and decided how much time had to be spent on each topic. Contracts between students and professors were based on the criteria of outcome measurement rather than on attendance. Committees of students monitored the teachers' professional conduct. The idea behind these rules was that the students were serious about learning. The professors did not work for a board of trustees, as they do in modern universities, but for the students. If they were not meeting the students' needs, they were dismissed.

In the Medieval university, students were the main protagonists in their own knowledge development process.

Throughout the Middle Ages, international mobility and exchanges of teachers and scholars were a common future of those collegiate societies. Learning was not separated from learners by artificial borders. The university community and the handicraft economy were interwoven, each having much to learn from the another. A transnational and collaborative context favoured entrepreneurship, and innovative businesses were created that replaced traditional forms of arts and crafts.

Entrepreneurial universities are today's version of the medieval collegiate society. They may be seen as "academic impresarios" whose mission is to achieve a brand identity (Exhibit 2.17) by bringing together the best content specialists (out-

standing academics and practitioners), junior teachers acting as "educational consultants", and students (Hague, 1991).

Exhibit 2.17

The case of an "academic impresario" designing a brand identity policy: The Futurewave Institute in Perth, Western Australia

The Futurewave Institute is an entrepreneurial university founded by private organisations based in Perth, Western Australia. The Institute aims at filling the gap in learning, from traditional systems to market requirements.

Brand background

- Concentrating on inspiring, educating and training for entrepreneurship and innovation in business.
- Segmented into three wide categories — starting with the young at high school level, those that aspire to learn more at a tertiary level and those who are already in the workforce.

Brand attributes

- Professional Focused — bringing together discipline and knowledge, in a framework that is focused on professional development within a global network or challenging individuals.
- Alignment — clear and concise way to maximise business potential. It is proactive and creative in approach, and fresh and customised in its outcome, through a collaborative and dynamic network.
- Momentum — building the continuous need for innovation. A pragmatic environment enabling students to compete in the global marketplace.
- Inspiration — a revolution in new thinking that will shape individuals and institutions to build and motivate cultural change towards entrepreneurship.

Exhibit 2.17 continued

Hero product brands

- Futurewave Creators
  - Corporate entrepreneurs (as defined in Chapter 1, par. 11)
    - Mentorship/In-house training
    - Part-time/vocational study
    - Events/seminars/speaker programme
- Futurewave Leaders
  - University entrepreneurs
    - Full-time study
    - Part-time/vocational study
    - Events/seminars/speaker programme
- Futurewave Champions
  - High School young entrepreneurs
    - Part-time/vocational study
    - Events/seminars/speaker programme

Market brands

A network of Futurewave Institutes in the Asia-Pacific region and partnerships with other entrepreneurial universities worldwide.

Source: Enterprise IG, Brand & Identity Consultants, 2002.

14.4. A WORLDWIDE NETWORK

An entrepreneurial university fosters interaction and networking in the same way that firms are expected to do, and in the same way that inventors such as Watt and Edison did, with scientists, economists, financiers, and other stakeholders and experts in the community.

Education and training at entrepreneurial universities such as the International University of Entrepreneurship are customised to bring to their partners a global formula and a global brand.

The brand-owning entrepreneurial university operates in close co-operation with an external worldwide network of alliance partners (academic institutions, business firms, e-technology enablers, tailored groups of consumer-students, and so on) with whom it forms a Value-Added Community — VAC (Means, Schneider, 2000). The VAC experiments with innovative forms of education in and for entrepreneurship, attracting a new generation of students — the *clerici vagantes* of modern times — who leave their own countries with the intention of being away for a couple of years or more. Usually, they return home having already implemented their entrepreneurial projects with the VAC's educational institutions and companies abroad where they have studied.

The university cities of the Middle Age used to harbour for a while students from other communities. Each of them played to his or her strengths, rather than ape the host university city. Along the route the *clerici vagantes* were pollinators of new ideas and projects that made the university cities wealthy. Nowadays a circuit of *native missionaires* like those in the Middle Age is a fertile ground for 'glocal' communities where the local dimension turns into a local *and* global dimension. One of the most striking examples of the formation of glocal communities is the circuit of students that links Mumbai and Bangalore with London, Boston and California (Figure 2.13). Twinning entrepreneurial projects cultivated at the university sites within the circuit open up the door to successful entrepreneurial-friendly environments that, in turn, foster new and emerging high-growth business communities.

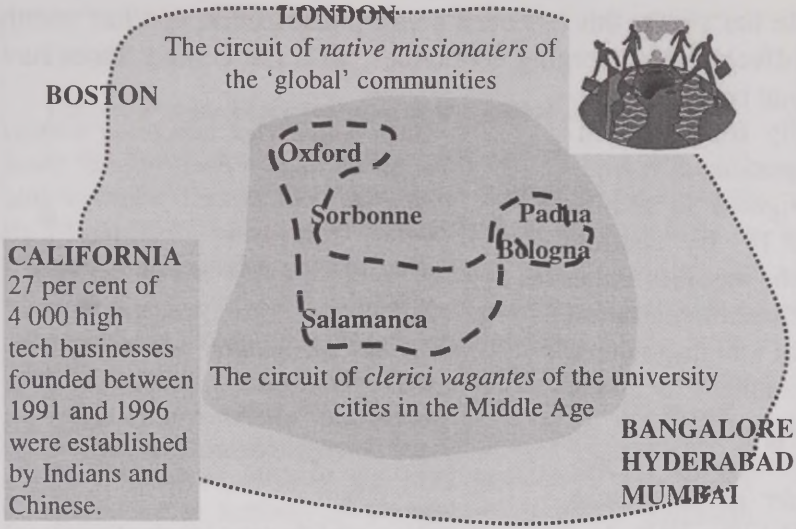


Figure 2.13. Student mobility in the Middle Age and in the today's 'global' dimension.

Entrepreneurial universities, then, design and manage global networks, onsite and online, which are created and developed by means of worldwide alliances with learning partners and business organisations that link student-centred learning to on-the-job activities. In such a co-operative environment participants can cultivate new business ideas and turn them into commercial realities. Participants can move from one learning location to another, as noted in the previous paragraph, and, in each location, the diversity and ethnic mix of both the student population and the faculty members play an important part in reducing the risk of a brain drain from developing countries and regions.

Diversity makes the power of difference. It creates an inter-cultural context of mobility and integration rather than a multi-cultural context of emigration and separation.

In the 1990s, this has been a vast phenomenon that has mainly affected the emerging economies, with the United States having benefited heavily from this migration, as is highlighted in Exhibit 2.18. By contrast, the mobility rather than the migration of high-powered intellectual assets stimulates the international transfer of ideas from the university to the marketplace and fosters international collaboration between academics and business people.

Open boundaries, education without borders, new connections, both physical and virtual journeys into other places and disciplines: all these are ingredients that foster new ideas.

Thanks to mobility within the network, informal exchanges take shape that are sources of creativity and cross-fertilization of ideas.

The network is an international platform for the mobility of the higher education communities of practice. These communities bring together in cross-functional teams, academics and practitioners from around the world. The integration of thinkers from industrial and consultant backgrounds with their academic counterparts strengthens the quality of educational programmes. Each partner adds value to the network, but the real value of it is greater than the sum of the individual parts. What makes the difference is a synergistic collaborative process involving people with complementary competencies, which results in a symbiotic learning network (Amidon, 2001).

Exhibit 2.18

United States: The epicentre of the global talent drain

In the United States, students mainly of India and China origin, nowadays represent almost one third of the high-growth companies mapping America's entrepreneurial landscape.

"In the 1990s, roughly 650 000 people from emerging markets migrated to the United States on professional-employment visas. Over 40% of the foreign-born adults in the United States have at least some college education, thereby making that country the epicenter of the global talent drain. Foreign-born workers now make up 20% of all employees in the US. About 30% of the 1998 graduating class of the famed Indian Institute of Technology — and a staggering 80% of the graduates in computer science — headed for graduate schools or jobs in the United States. Some 80% of foreign doctoral students in science and engineering plan to stay there after graduation — an increase of 50% in 1985".

Source: Devan, Tewari, 2001.

14.5. THE PROCESS OF NEW BUSINESS CREATION

Aligning learning to entrepreneurial opportunities triggers the process of new business creation. From this perspective, entrepreneurial universities implant entrepreneurship cells into the body of academic culture in order to achieve an economic return from the amount of knowledge generated through research projects, empowered teams of teachers, students and business people, face-to-face and electronic relationships, and networked enterprises emerging from academic spin-off activity. In so doing, entrepreneurial universities encourage students to

think unconventionally and produce the new type of educated risk-taking individual needed in entrepreneurial economies.

Activity on the two complementary fronts of entrepreneurial capability and entrepreneurial opportunities is critical for raising the level and composition of entrepreneurship from that which is mostly marked by small business creation (as featured in the industry cluster-type model of entrepreneurial motion) to that in which EGCs (as featured in the knowledge cluster-type model of entrepreneurial motion) display increasing prominence (see Figure 2.10).

In view of the above, the entrepreneurial university gives a response to the following key questions which the academic fails to address:

- How do faculty staff, graduates and students become aware of business ownership?
- How does this awareness move on to interest?
- How, why and over what period of time does interest translate into action?
- What makes some academics consider entrepreneurship as an option, and how do they pursue this option?
- What forms of enterprise do they establish?
- Do they prefer working as individuals or as teams?
- What is the nature of the relationship between the academic and his or her institution?
- How to help combine technical skills with the ability to handle complex organisational issues of starting and managing a business?

The nature of these questions pushes the entrepreneurial university to pursue actions aimed at demolishing the cultural barriers that are major impediments to the success of academic entrepreneurs. What these barriers are is shown in Table 2.12 where findings from a case study referred to a Southern Italian university are illustrated.

Table 2.12

Cultural barriers for academic spin-offs: The case of the University of Salerno in Italy

Orientation of research groups towards industrial applications is considered not very important. Patents are a minor output of research groups.			
	Cutput of research groups		
	medium	**low**	**high**
Scientific publications	100	0	0
Patents	9	39	52
Research groups lack of a business vision.			
	Business vision of research groups		
	medium	**low**	**high**
Knowledge of competitive forces of the market	3	32	65
Exploitation of innovative ideas does not fit into the scenario of expected benefits from business relationships.			
	Benefits from relationships with SMEs		
	major	**minor**	**no**
Research funding	60	30	10
Exploiting innovative ideas	21	12	67
Joint commercialisation of R&D results is not a driver for technology transfer from research groups to business firms.			
	Efficiency of different methods for technology transfer		
	very efficient	**fairly efficient**	**not efficient**
Training of SME personnel	55	35	10
Joint commercialisation of R&D results	3	9	88

Source: Bellini, Zollo, 1997.

Through permitting all spin-off providers and developers among academic, business and other independent parties to have full access to the building of a new enterprise economy, the entrepreneurial university, embedded in a KC, marks a turning point in respect of the old-fashioned, industrial communities that have only been capable of building fragmented and isolated proprietary pieces of the spin-off mechanism. Integration and communication replace fragmentation and isolation. The entrepreneurial university is the open environment where all parties can freely intervene to adjust and upgrade that mechanism over a period of time.

The process from creative idea generation to full commercialisation is articulated in two consecutive phases. First, there is the pre-incubation phase (Figure 2.14), bridging the gap between the disparate cultures that must be integrated in view of gearing perceived opportunities more closely to the marketplace. Through action learning and team-based pre-start-ups, pre-incubation leads the way in ensuring that talented students learn how to change their ideas and projects into business processes for developing a new product, exploiting existing know-how and accessing others' technology or skills. The emphasis shifts from conventional academic excellence to the acquisition of creative and practical skills by motivated individuals who could create their own compa-

The entrepreneurial university responds to John Kay's principle of obliquity, which states that in an environment where success and survival depend on our relationships with our environment, and where our understanding of these relationships is very incomplete, we rarely prosper by pursuing our objectives too directly.

(Kay, 1998)

The pre-incubation phase is a sort of oblique approach to the spin-off generation.

nies from the business practices they have been dealing with in the learning network. Exhibit 2.19 describes the case of the Cisco's Networking Academy Program.

Pre-incubation is followed by the incubation phase, embedded in a business milieu where large endowments of intellectual assets and a wide range of specialised physical infrastructures are available (Figure 2.14).

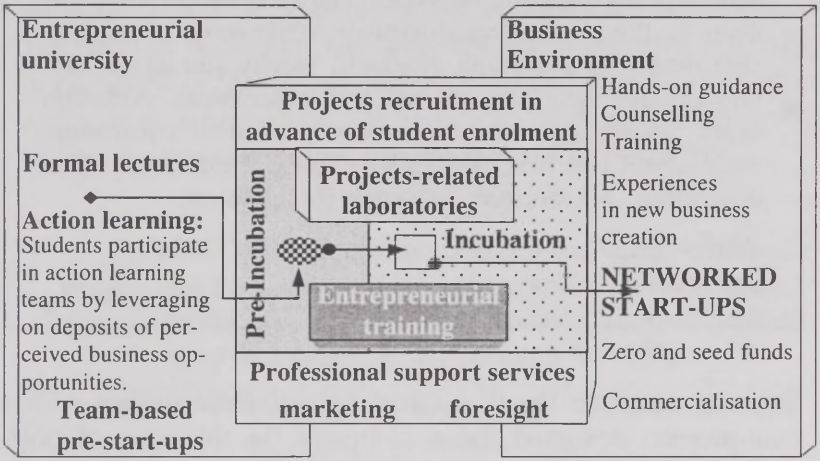


Figure 2.14. The process of new business creation at the entrepreneurial university.

By spreading knowledge about entrepreneurship throughout the academic and the business environments, the entrepreneurial university enables communities of like-minded potential entrepreneurs to come together anytime, anywhere. Moreover, the launch of start-ups, which are not isolated but networked to industrialists with a proven track record in their industry (see the Dutch Twinning Scheme in Exhibit 2.10), is facilitated by the university's role as architect of key business relationships.

Exhibit 2.19

The Cisco's Networking Academy Program

The Cisco's Networking Academy Program. A partnership between Cisco (the worldwide leader in networking for the Internet) and education, business, government, and community organizations around the world. The Networking Academy curriculum centers on teaching students to design, build, and maintain computer networks. The Program prepares students for the 21st Century workplace, while serving as a valuable model for e-learning. Students, faculty and administrators discuss their programmes and experiences. Although every Networking Academy offers a standard curriculum, each school can tailor its program to meet the needs of its population, infrastructure, and goals for the future.

Source: http://www.cisco.com/warp/public/779/edu/academy/...

Students combine the theoretical part of their studies with a real project, designed for a company. In the case of post-graduate courses, while the academic universities still rely on students independently from business projects, the entrepreneurial university first looks for projects inside companies and then recruits young graduates as "project managers" for their implementation.

A 'high-touch' approach in terms of real business experience allows each and every participant to undergo something of a personal transformation from a student or graduate into an aspiring entrepreneur.

During the second half of the 1990s, the Steinbeis Foundation in Stuttgart has been successfully experimenting a prototype of this model. The Foundation introduces the would-be project manager (who is a graduate in engineering or natural science)

to the company. If the company accepts the person for the project, a contract between the graduate and the Foundation is signed. The Foundation itself signs a contract with the company, is responsible for the results and provides the coaching for the project-manager. The company pays for the project and the project manager gets a reduced salary for his work from the Foundation. The programme lasts 10 months. In this period the project manager prepares the project for the company in about 1 300 hours of work. Concurrently, he gets 12 blocks of seminars in different areas of the international management. The amount of money the company saves has been estimated in the range of 20–30 per cent if compared with the cost of an engineer in a permanent job and much more in relation to the hiring of a junior management consultant (Table 2.13).

Table 2.13

Project cost for the firm. Cost comparison with permanent employee in the firm and with junior management consultant (cost of engineer in permanent job = 100)

	Project manager	Engineer in permanent job	Junior manager consultant
	(1)	(2)	(3)
Total cost	70	100	180
Cost per hour	80	100	210

(1) and (3) project cost; (2) recruitment cost, salary, additional salary costs.

Source: Steinbeis Foundation.

A second type of model, expounded in Exhibit 2.20, is the educational programme designed by the International University of Entrepreneurship and implemented in collaboration with academic universities, other higher education institutions and even the learners. The programme is anchored to the con-

viction that being an entrepreneur is "a way of life made up of an obsessive vision-making, a touch of craziness, a pathological optimism, and the ability to stand out from the crowd" — as has been pointed out by Anita Roddick, the founder of The Body Shop (Roddick, 2002: 7). All these attributes are subjects that cannot be taught. Thus, the programme is centred around "the development of the capacity of students to 'feel' entrepreneurship" (Gibb, 2002: 137) and how learning is fostered by generative rather than adaptive experience (see paragraph 5 in this Chapter) in a wide variety of perspectives.

Exhibit 2.20

Business to business in reality: Education by business projects. From science to applications and markets.

Master in entrepreneurship: a joint programme between the International University of Entrepreneurship and the University of Tartu.

The Master:

- Stimulates entrepreneurial capacity.
- Couples together entrepreneurial capacity and entrepreneurial opportunities.
- Enrols students from all faculties, not only — as usually happens — from business schools and economics.
- Links companies and students.
- Makes risk capital available to students with solid ideas to start up a firm of their own.
- Provides students with an incubator-like facility.

The Master's degree is an interdisciplinary business education and project-based curriculum that raises students' awareness of entrepreneurship as an alternative career choice among many options. The curriculum aims at enhancing the entrepreneurial role vis-à-vis managerial, professional and technical functions.

Exhibit 2.20 continued

A student-centred learning setting tightly connected to operating businesses provides much of the material and the faculty for participants to become literate in entrepreneurship and more enterprising.

Students learn how to deal with situations involving high levels of uncertainty, complexity and competitiveness. On the one hand, this could eventually result in developing a good start-up. On the other hand, students will definitively improve their employability as businesspeople capable of recognising and developing new opportunities inside existing organisations.

Students combine the theoretical part of their qualification with business projects. A business-projects portfolio feeds the training process, and students are involved in it through a programme for internships that give them hands-on experience in an entrepreneurial environment. The IUE founder, a knowledge pool of the Zernike Group BV, provides the initial source of business projects, thanks to its expertise in international marketing and commercialisation of innovative products and services.

Availability of start-up financing is secured by a cluster of organisations that includes business firms with expertise in starting and growing new companies, zero-stage and seed capital funds, informal investors and incubators.

The International University of Entrepreneurship does not worry about age. The population of students, enrolled in accordance with the upstream recruitment of business projects, is selected in terms of quality rather than age. University students and graduates are only one target for advanced entrepreneurship education. The IUE also offers entrepreneurship education to the working adult between 25 and 44 years old. This is the

demographic group most likely to start a new business (National Commission on Entrepreneurship, 2002a). Moreover, since in the education system it is unpopular to teach the characteristics of entrepreneurship, the IUE is holding courses designed for teenagers so as to offer them insights about the entrepreneur in his or her real-life business. This will help them in all career fields besides that of running a company. Furthermore, the IUE does not restrict its activities to creating new entrepreneurs but also to bringing to a much higher level of performance those involved with business.

Schoolchildren will be inculcated with the kind of attitude and skills that will be essential for the budding entrepreneur.

(Excerpted from the Smart School Flagship long-term plan of the Malaysian government)

In summary, entrepreneurial universities are intellectual infrastructures that lead to the formation of new ventures which do not remain small businesses for long. They offer innovative learning settings and hands-on experiences inside operating businesses, thereby encouraging more people to become literate in entrepreneurship. Project-based curricula and collaborative partnerships with the private sector yield academic and extracurricular programmes that pay for themselves.

The entrepreneurial university throws up novel insights into the education market.

In addition, as catalysts of a pool of interests toward which agents in the market and investors with specialised expertise in starting and developing new companies tend to converge, entrepreneurial universities make start up businesses more likely to succeed. Risk capital is made available to students with sound ideas to start up a firm of their own.

That entrepreneurs are 'born, not made' is a common view. The claim of entrepreneurial universities is that people who are taught about entrepreneurship are more likely to build on new companies and to take advantage of entrepreneurial opportunities.

In the introduction to a previous book (Mitra, Formica, 1997: 20) we have observed that "The university is the symbolic milieu of 'creators': *intrate spectatoteres exite creatores* (those who enter as spectators exit as creators) is the inscription found at the entrance to one of the Italian universities". Those who enter creators exit as entrepreneurs might be the complementary motto of the entrepreneurial university.

A transitional sequence (or divergence) between learning (first) and (then) working has marked the life of many an industrial worker for whom the academic university has contributed to shape a 'once-and-for-all' career plan. The synchronisation (or convergence) of work and learning is the very feature of today's knowledge worker for whom the entrepreneurial university is the agent that speeds up the metabolism of his or her knowledge body throughout his life. And since lifelong learning paves the way to a promising business market for education, the entrepreneurial university becomes one of the leading industries of the new enterprise economy.

The dividing line between the entrepreneurial university and the academic one is far from clear. In practice, the former as a complementary institution might revitalise the declining life cycle of the latter,

The entrepreneurial university makes the academic university more valuable for the customers (students, parents, government, donors, and companies). A complementary relationship would help enlarge the market for education, being customers attracted to buy additional services to those provided by academic institutions.

should its role grow in popularity within the academic community. A lasting collaboration requires both institutions to reach, through totally different routes, the same conclusion and complement suggestions about how the role of education as a motor for the entrepreneurial economy ought to be expanded. Although it is commonplace to emphasise collaboration enabling incumbent academic institutions to be more entrepreneurial, for the time being both complementary relationships and competition between the new entrant (i.e., the entrepreneurial university) and the incumbent (the academic university) are likely to be displayed.

15. ANGEL INVESTORS AND SEED CAPITALISTS

Experience has proven that quite a number of projects remain forever buried in research, commercially promising technologies often get stuck in an early stage, and many of the those firms that are growth-oriented fails in their early lives because they cannot cross the so called "valley of death" or "no man's land", due to the lack of a proper market approach and risk-bearing capital.

Important innovations are lost due to the lack of management support, a proper market approach and risk-bearing capital.

Traditional finance companies (banks, etc.) are not keen on providing capital in the pre-start up phase of highly innovative businesses. Start-up funds bridge this gap in an efficient and business-like way. The main objective of the funds is to create technological and innovative industrial businesses by providing risk-bearing capital and management support. Funds will operate exclusively as seed capital organisations which participate in the start-up company and also provide intensive management support, thus increasing the potential for the success

of the new enterprise. Furthermore, the intensive support gives rise to a positive effect on the return on investment.

Communities of practice shaped by seed capitalists (Exhibit 2.21) and informal or 'angel' investors (Exhibit 2.22) as well, who first and foremost invest in people, coalesce in KPs where they can spontaneously and transparently interact with complementary experts and potential entrepreneurs. That in the same pool come together all the actors whose expertise is needed to start growth-oriented firms, this yields benefits in terms of:

- Supporting potential entrepreneurs to draw up business plans and business strategies in the field of market analysis, feasibility studies, financial planning, commercial contacts, recruitment of additional management, and so on.
- Financing technical development of new products or product-prototypes.
- Providing advice and support in bringing new products or product prototypes into a commissioning phase.
- Involving professionals and businessmen who are members of knowledge pools abroad so they can act as spearheads for the new born companies to enter foreign markets.
- Providing risk capital, advice and support in bringing the business idea to a stage at which it will be an interesting subject for investment by a venture capital organisation (this process is illustrated in Figure 2.15).
- Making available an incubator-type organisation equipped to host growth-oriented start-ups.

Exhibit 2.21

Creation and management of seed capital funds for high-growth start-ups: The case of the TIFAN fund and the Zernike Group in the Netherlands

Technologie-en Industriefonds voor Amsterdam en Noord-Holland (TIFAN) B.V. is one of the seed capital funds that were initiated by the Dutch Ministry of Economic Affairs (MEA) in order to provide early stage (start-up) capital to high-technology starters. TIFAN was set-up as a public-private partnership of the following organisations: Rabobank Nederland and local operating Rabobanks in Noord-Holland; Cities of Amsterdam, Den Helder, Alkmaar and Hoorn; University of Amsterdam; Province of Noord-Holland; HEIs of Amsterdam and Alkmaar; and Zernike Group.

The main objective of TIFAN is to create technological and innovative industrial businesses, related to the know-how areas in the province of Noord-Holland by providing risk bearing capital and management support. The fund exclusively operates as a capital provider for starting companies and companies less than 3.5 years old. In exchange for the capital injection, TIFAN obtains a minority share in the company. After a number of years when the company is growing and developing, and no longer dependent on seed capital because it has become an object of interest for regular capital (e.g. VC, bank), the shares of the company are sold. As TIFAN is a revolving fund, profit will flow back into the fund in order for other starters to benefit from it. A Board of Directors, consisting of seven representatives of the participating organisations takes decisions on investments. The total fund capital of TIFAN B.V. is € 9 million.

Exhibit 2.21 continued

To manage the TIFAN funds the Ministry of Economic affairs appointed the Zernike Group. The Zernike Group, a Dutch based company, is an international company in the field of risk-bearing capital, technology transfer, facility management, patenting and licensing, engineering, and consultancy (accounting, financing, marketing and sales). The Zernike Group has over € 177 million in start-up funds under its congtrol. It is an active co-investor with RaboBank, AEGON, and ABN-Amro, and the international venture capital industry. The Group is a shareholder in different companies in the field of technology and technology transfer.

The development of Zernike Group was initiated in 1992 by the management of the Zernike Science Park in the Netherlands. In 1983, the University of Groningen, regional authorities and the Ministry of Economic Affairs created a comercial/academic organisation in the form of a science park in order to synergies science and business. Over the years, the development of the Zernike Science Park led to many new ideas on the commercialising of scientific development. As a result, the activities of the Science Park changed signifycantly, offering seed capital via the Zernike Seed Fund, Hi-Tech. Ventures and Z-Finance as well as a methodology for protecting and selling developments, commercial marketing and sales of high-tech products, a department for accounting and tax support, and business accommodation. These changes were made to achieve a main goal, which is to become self-sufficient by carrying out activities in technology transfer that are comercially worthwhile. In 1992, the management founded a private company, the Zernike Group B.V.

Source: www.zernikegroup.com

Exhibit 2.22

The case of the US community of angel investors

Angel investors are individuals, often former entrepreneurs, who invest in growing companies for a variety of reasons, ranging from fun to making a high return on investments to an interest in mentoring new firms. In addition to providing funds, they provide advice, counsel, and contacts to new entrepreneurs. Typical angel investments fall in the range of $ 50 000 to $ 500 000 per transaction. These relatively small increments put together are substantsial. In 2000, the University of New Hampshire's Center for Venture Research estimated that 50 000 companies in the US received approximately $ 40 billion in angel funding. Until the venture capital boom of 1999–2001, angel investing regularly outpaced the total investments of all venture capital firms put together.

The average size of an angel investment between $ 50 000 and $ 500 000 falls in a range that fills an important niche in private equity markets. Entrepreneurs regularly report that obtaining funding in the range between $ 100 000 and $ 2–3 million can be quite difficult. These amounts are often too small to interest venture capital firms or banks, but are too large to be generated via friends, family and other personal contacts. Thus, angels play a critical role in nurturing entrepreneurship.

Traditional business angels worked alone or in small unorganized groups. Today, many regions of the US boast organized angel groups that have become a key component in the private capital markets. These formal groups may actually serve to encourage more angel investment. By reducing exposure and formalizing the investment review process, formal angel groups may serve to encourage more people to consider investing.

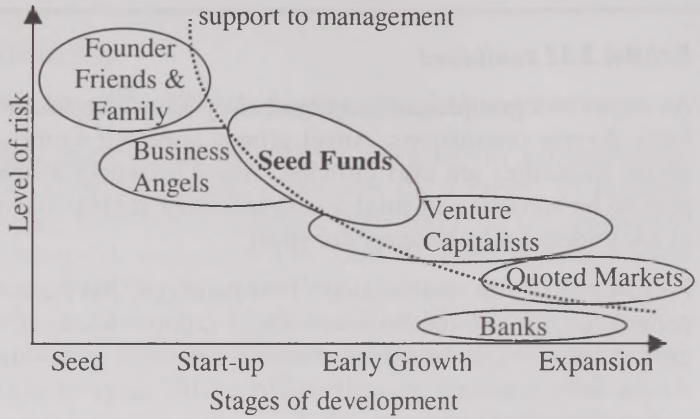
Exhibit 2.22 continued

As organized groups have emerged, they have also taken on more diverse orientations. Angel groups targeting women or ethnic minorities are also growing. Angel networks also appear to be sprouting in rural areas, and other regions outside of the traditional technology hot spots.

Formal procedures and industry "best practices" have accompanied the rise of the business angel groups. Most of the groups seem to use similar investment screening procedures. At the same time, groups still utilize a wide range of organizational and legal structures.

Source: Excerpts from National Commission on Entrepreneruship, 2002b.

A broad spectrum of business angels, seed capitalists, and householders who make transactions in the financial market is beneficial in two ways. It helps transform a workforce- and payroll-based economy into an entrepreneurial one that enhances business partnership contracts. Second, it makes the economy as a whole more productive and growth-biased, since the wealth effect generated by a broad participation in fast-growing start-ups encourages consumption.



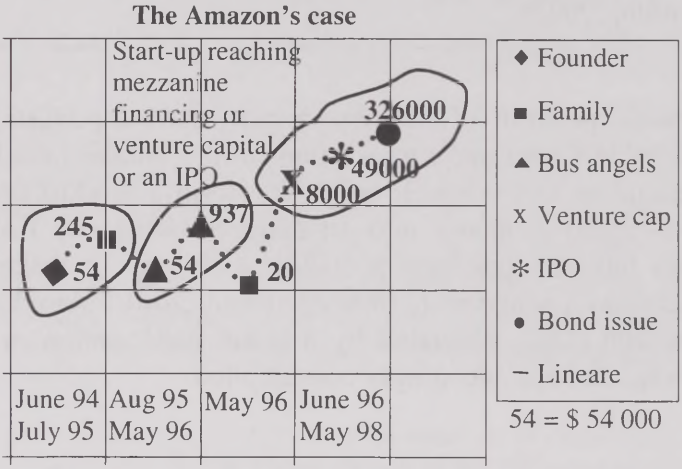


Figure 2.15. Financiers of the entrepreneurial growth companies.

Stages

Seed — incubation; concept to be proven and developed.

Start-up — product developed; initial marketing takes place.

Early growth — first enlargement; the company is yet unprofitable.

Expansion — fast enlargement; the company is profitable, goes public (i.e., stock exchange quotation) or is sold by the financiers.

Informal investors and seed capitalists provide strong support to management, which drops heavily in the later stages (see the dotted line).

Seed funds bridge the gap between informal investors and the venture capital industry.

16. CONCLUSIONS: KNOWLEDGE CLUSTERS AS ENGINES OF NEWBORN SOPHISTICATED ENTERPRISES

Whether or not a society is entrepreneurial depends in part on the legitimacy and esteem accorded to those who pursue the entrepreneurial route. Communities in which entrepreneurship can thrive create more jobs and wealth. Entrepreneurship foments the Schumpeterian process of creative destruction through which the new replaces the old. New opportunities are perceived, capitalised and converted into marketable products or services.

Fresh competition in the free market economy and narrowing down of the international borders will significantly influence new company formation and the underlying models of entrepreneurial motion. Ample opportunities for creativity and innovation are driving the move towards the formation of small businesses that, from the start, enter into a fast and high-growth phase — the so-called "entrepreneurial growth companies".

Knowledge clusters shows a threefold entrepreneurial trait: their organisation is entrepreneurial, their members seize entrepreneurial opportunities and entrepreneurial patterns mould their reciprocal relations.

In this chapter we have examined the entrepreneurial stance that typifies knowledge clusters. Knowledge pools and communities of practice that make up KCs are entrepreneurial in their attitude, their members are or can turn into entrepreneurs, and entrepreneurial patterns

shape the interaction between them. On the whole, KCs envisage a new enterprise economy based on fast-growing start-ups.

It is in the KC context that widely held myths and misconceptions about entrepreneurship throughout society and policymakers are challenged. We have already commented on myths such as those whereby most entrepreneurial companies are based on breakthrough technologies and their founders are experienced experts in their fields (see par. 7 in this Chapter). Other myths concern the high level of risk that presents a new undertaking, the importance of the business plan and the reliance on venture capital (Table 2.14).

Table 2.14

Risk, business plan and venture capital: Three myths about entrepreneurship

Uncalculated risk: Entrepreneurs take wild, uncalculated risks to start their companies. In reality, many entrepreneurs, when they start out do not have much to lose, and they have an uncanny ability to convince others — employees, individual investors, suppliers, and landlords — to share their start-up risks.
Well-conceived plan: Entrepreneurs have a well-researched, well-conceived strategic plan when they start their companies. What enables most entrepreneurs to be successful in their new ventures is their flexibility to change. Starting a new business is like jumping from rock to rock up a stream rather than building a bridge from a blueprint. Companies develop tightly constructed business plans when they are ready to seek outside investments.
Dependence on venture capital: All entrepreneurs rely on venture capital to fund their businesses. Venture capital companies only fund a very small number of businesses each year — about four thousand overall. Most entrepreneurs start with their own money and money from friends and family, and only look to venture capital when they need to capitalise on their successes, usually in the later stages of growth.

Source: National Commission on Entrepreneurship, 2001b.

As for uncalculated risk, spontaneous inter-personal relations, which are specific of cross-boundary knowledge pools and communities of practice, encourage the new entrepreneur to be guided by his or her well-developed sense of the need to use outside resources, be they human, technological or financial.

As for the business plan and the funding needed to manage the challenge of fast growth, the real problem is not the dependence on venture capital, but the availability of those options both in terms of risk capital and management support that are represented by informal investors and seed capitalists — in addition to a conducive macroeconomic framework (for the latter, see in Exhibit 2.23 the measure for tax relaxation in favour of fast-growing businesses conceived by the US legislator).

Exhibit 2.23

The U.S. BRIDGE Act

Introduced by U.S. Reps. Jim DeMint (R-SC), Brian Baird (D-WA), and a bipartisan list of co-sponsors, the BRIDGE Act seeks to help entrepreneurs grow during a period many call the "valley of death" or "no man's land".

Fast-growing firms face major challenges in terms of manag cash flow. When first starting out, an entrepreneur takes earnings (profits) and reinvests them back into the business. If the firm starts growing rapidly, these revenues can be insufficient to allow the entrepreneur to hire new people, make capital investments, create new marketing channels, and the like.

Exhibit 2.23 continued

Seeking outside funding is the typical response to this quandary. But finding this money is difficult and often impossible. New entrepreneurs generally need small amounts of funding (somewhere between $ 250 000 and $ 1 million). Few venture capital funds provide this sort of funding, and most banks require collateral or a more extensive track record than the new entrepreneur can provide. The result is "No Man's Land" — that is, the entrepreneur is capable of expanding his or her business, but is unable to amass the funding needed to do it.

The BRIDGE Act seeks to address this challenge by allowing tax deferrals by fast-growing businesses. Specifically, the proposal focuses on small firms with less than $ 10 million in gross receipts and with revenues growing at a rate 10% higher than the average of the previous two years. Firms in this category will be able to defer up to $ 250 000 of federal income tax liability for two years. Eligible companies would then have a four-year time frame to pay the deferred amount, plus interest.

Source: http://thomas.loc.gov/cgi-bin/bdquery /z?d107:h.r.03062

ICs are a fertile ground for small businesses, which fight for their financial self-sufficiency rather than being focussed on growth. For example, in its entrepreneurship assessment referred to Italy, where most of the entrepreneurial population has been incubated in and nurtured by the industrial districts, the Global Entrepreneurship Monitor (Minniti, 1999) has remarked:

- Self-sufficiency — that is, the owner-manager of a small business is inclined to be financially and managerially self-sufficient, having little or no recourse to external re-

sources. A self-imposed limit to growth discourages the development of growth-oriented firms.

- The paucity of financing options for entrepreneurs and the consequent financial fragility of their firms.
- Their dependence on the banking industry and the heavy use of short-term debt.
- The creation of many small local banks and the development of close customer relationships, which do not include the provision of capital in the pre-start-up phase of highly innovative businesses.

Conversely, KCs serve the broader purpose of cultivating growth-oriented new ventures. Nascent entrepreneurs focussing more on growth and less on self-sufficiency can tap into the wealth of "animal spirits" and their experience inside knowledge clusters. There is a simple reason why this can happen. The opinions of the individuals who, on their own capacity, participate in knowledge pools and communities of practice carry more weight than the views of the organisations to which they belong. Creativity in business is stimulated by investment decisions whereby the received wisdom of corporate principles of rational calculation is counterbalanced by the capability of the "animal spirits" to seize mere ideas. "If the animal spirits — Keynes noticed in his General Theory — are dimmed and the spontaneous optimism falters... enterprise will fade and die", and nascent entrepreneurs will be disheartened in the motivation to exploit their own specific talents and ideas in new areas of industry.

CHAPTER THREE. CLUSTER POLICY

The best people and resources are usually invested in an attempt to defend the old. A public policy issue that concerns me is that there's always a constituency for the old, but there's not such a vocal and well-organized constituency for the new.

(James Utterback)

We see the opening of a Pandora's box which, once opened, cannot be shut again.

(John Kay)

1. INTRODUCTION

Growth is not the result of a master strategic plan but the product of the spontaneous co-evolution of technology, the physical and social environment and economic institutions. Yet policy-makers have held and still hold sceptical view about the vision of the cluster economy as an atomistic one in which basic

decisions are made in an impersonal market and the pursuit of self-interest produces the greatest social good. Policymakers' understanding is that in self-government of clusters there are blanks, which have to be filled by government.

In general, local and regional authorities with the power to shape policies regard the cluster as a small child who needs a tutor, leader and educator until such a time as he/she is capable of acting on his/her own.

Cluster formation and development — their argument goes — involves some inheritance and serendipity, but requires purposeful action. Thus, the role of government and state institutions lie in determining the initial phases of the cluster building process and shaping its evolution.

In their effort to examine why clusters should be part of an overall regional economic strategy, policymakers have been attuned to the recommendations of both intergovernmental organisations like the OECD with its Local Economic and Employment Development Programme (LEED) and prestigious national think-tanks as the DATAR in France, which argue that local or regional authorities have a duty to co-ordinate cluster activities. Local/regional authorities should play the role of catalyst. They ought to raise awareness among businesses for the need to co-operate, as well as compiling basic data about the industrial sector concerned and detecting problems to be solved through collective action. Depending on regional culture, those authorities can also play a role as initiators of the process by promoting meetings between the various partners and by guaranteeing or even financing the initiative.

Within the cluster economy, a fertile ground for public intervention encompasses, among other things:

- Those firms, mostly micro and small enterprises, which are not organised to handle compliance or govern itself.

- Wealthy and contented mature clusters enjoying the fruits of labours past but reluctant to innovate.
- Grown-up clusters that need to be expanded beyond national borders.
- Potential or embryonic clusters.

Industrial self-discipline tempered by governmental partnership is the fundamental theory underlying public intervention. A fair measure of state economic interventionism should play an important role in the evolution of the cluster as a non-individualistic market economy or communitarian society, based on mutual trust, spontaneous sociability and co-operative relationships within a constellation of small enterprises. Under a regime of *laissez faire*, to be forced out of business is the danger that small firms often cannot avoid. To achieve economic emancipation, their principals ought to perform the role of dynamic entrepreneurs on a scale larger than that of the local and even the national economy. Expansions of market would require the creation of technical and commercial openings.

Public authorities have been lobbying hard in favour of the orthodoxy that government is the centre of good economic performance.

Crucial to the delivery of this vision and these roles is the creation of effective instruments of business-government collaboration. Intermediate institutions are needed which sit between the laissez faire and the commanded economy, neither controlled by any specific group nor directed by government. This is an Agency-based public-private partnership or, in the common parlance, a "quasi-governmental development Agency", which sees co-operation, not benign neglect as the better organising principle to achieve economic dynamism balanced by social and environmental responsibility.

Integrating associational activities, industry, trade and professional associations, unions, consortia of firms, et cetera mould

the Agency, enhancing the concept and practice of a co-operative, collectivist democracy in which public interest adds up to the aggregate of these pressure group interests. In this domain the Agency claims to play the role of 'hub actor' or 'meta-manager', whose mission is that of co-ordinating inter-organisational processes and activities mainly addressed to boost innovation and competitiveness, and managing as well both tangible and intangible assets (Carbonara, Mitra, 2001).

The Agency provides the cluster's governance structure.

The Agency should enable firms to achieve their aims. By and large, the Agency's activities embraces advocacy (i.e., a voice at the table of all regional administrative structures), input into policy formulation (from regions to centre and within regions), support and help in bidding for funds from all sources, incubation of projects, technical advice.

This chapter deals with the subject of quasi-governmental Agencies designed to foster cluster-based development as providers of business services. We give some thought as to why and how this particular type of para-governmental organisation (from now on referred to as the "Agency" or "Agency model") is influenced by or even depends upon ideologues and organised economic interest groups, indirectly manoeuvred by government officials — all claiming to determine what values ought to be shared in the cluster. The main conclusion is that the Agency model is by far the less effective means available to policymakers who would be willing to induce governmental partnership both as a vehicle to reinforce existing clusters and an important factor in cluster building.

Prospects for success are limited in the case of government approaches that rely on programmes run by government agencies. Active public intervention that gives power to these

agencies to act for the creation and development of clusters means that it is the government that "steers and rows". Instead, clusters requires private leadership responsibilities from civic entrepreneurs. These are the business owners and managers who bring their vision and commitment into the arena (Exhibit 3.1). If there is a role for interventionist policies in coping with the challenges of the cluster economy, it is that of giving a much greater voice to free agents such as those facilitating intermediaries positioned in the marketplace who compete among themselves to meet the cluster needs.

Public intervention for clusters demands a light touch. Government should encourage private leadership rather than relying on government agencies with a mandate for cluster creation and development.

Exhibit 3.1

A civic entrepreneur: Fred Terman

Fred Terman is the epitome of the civic entrepreneur. The "random" catalytic event he produced gave birth to the innovative cluster of ICT companies in the Silicon Valley. Terman was Dean of Stanford University's Department of Electrical Engineering, and had a vision of close industry-university partnerships. He convinced Dr. William Shockley, the inventor of the electronic transistor, to establish in the new Stanford Industrial Park, with a brains trust of young engineers from MIT etc. But eight of the brightest were frustrated and alienated by Shockley's caustic personality, and left to form Fairchild Semiconductor Corporation — Intel and Motorola, are descendants of Fairchild.

Source: The Clustering Alliance Newsletter, May 2002, No 29.

It has been advocated that cluster-based local economic development requires a cluster facilitator funded by an economic development Agency (Exhibit 3.2). The weak point of this move is how to forestall the risk that the facilitator would break away from the marketplace and move into full-swing business-politics.

Exhibit 3.2

The cluster facilitator

According to Cluster Navigators Ltd, a New Zealand firm that provides consultancy and training on cluster-based local economic development, the cluster facilitator "is a cornerstone in cluster development, with a long term role".

"The facilitator is usually funded, particularly in the early stages, by an economic development agency. The role includes building a private-sector led leadership group for the cluster, and supporting task forces/project teams. It is important that the facilitator empowers others, partly so a portfolio of early initiatives is developed".

"Through an in-depth knowledge of the key stakeholders within the cluster, the facilitator adds value through establishing linkages at the network, supply chain and cluster levels".

"The facilitator needs to be comfortable with leading from behind. The role is essentially that of a relationship builder, not an analyst, removing the isolation of many cluster stakeholders".

Source: LED News, The Competitiveness Institute, September 2002.

2. BLOOMING, WITHERING AND THE RETURN OF THE AGENCY MODEL: THE US EXPERIENCE, 1933–2002

Early in the decade of depression President Franklin Roosevelt urged innovative solutions to lift the country out of the depths of the Great Depression. The TVA (Tennessee Valley Authority) Act and the National Industrial Recovery Act signed by Roosevelt, respectively, on 18 May and 16 June, 1933, were two of the New Deal's most innovative ideas. In particular, the Tennessee Valley Authority, envisaged by the President as "a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise", was a totally new kind of Agency from which later on, in other countries and different circumstances, public authorities drew inspiration.

Roosevelt's model of Agency inaugurated the age of administrative processes replacing the market in order to secure efficiency and protect both producers and consumers (Hawley, 1966). The New Deal's policy sought to prevent "excessive competition". To stop prices falling, controls were brought in, alongside other new and avowedly anti-business regulations. Corporate welfare was assumed to be the outcome of the panoply of government-approved business agreements sponsored by a number of business organisations and endowed with subsidies.

A distinctive trait of TVA was the extensive power exercised by local interest groups that fix the agenda and determine the taking-decision process of the TVA's programmes (Selznick, 1966). In this respect the TVA acted as a precursor or pathfinder of the post-war interest groups led type of agencies.

Four decades later, in the summer of 1977, and in totally different conditions, "David Packard asked a number of his fellow CEOs to join him in creating a proactive voice for Silicon

Valley businesses. The result was the formation of the Silicon Valley Manufacturing Group, which has successfully tackled some of the toughest challenges facing high-tech employers and their employees"[15] (www.svmg.org).

Similar to the Roosevelt's Agency, the Packard's Group searched for innovative solutions to issues like transportation, housing, education, and the environment. But far from Packard's mind was the vision of a non-market alternative type of Agency. Even if the Manufacturing Group was "founded on the premise that local employers should be actively involved in working with government to find innovative solutions"[16], the Group is a lively sign of a new industrial self-policing. It is the market rather than an administrative process that drags the cart of the economy. The Group has proved that cluster development in Silicon Valley as well as in other communities of the USA can be successfully driven by industrial leaders. The States and regional authorities provide only indirect assistance for education, housing, transport and telecommunication infrastructures, and environment.

---

[15] "As of January 2001, the Manufacturing Group is proud to represent 190 of Silicon Valley's most respected employers who provide nearly 275 000 local jobs. Membership is open to high-tech firms and supporting industries such as software, systems, manufacturing, financial services, accounting, transportation, health care, defence, communications, education and utilities" (www.svmg.org).

[16] The Group has established a Government Relations Committee whose goal is "to provide member companies with opportunities to meet and establish positive relationships with local, state and federal public policy leaders, and to review and advocate on select tax, finance, expenditure and performance policies of government Agencies. In addition, the Committee educates member company representatives about public policy issues, processes and systems" (www.svmg.org).

It took twenty or more years to complete the road of self-government. In 1998, after only two decades since Packard paved the way for a market option to the Agency model, 78 Silicon Valley entrepreneurs signed a "Declaration of Independence" in order to be free from subsidies. As one of the Declaration's authors, T. J. Rodgers (Cypress Semiconductor CEO), puts it: "Each year the US government gives away nearly US $ 65 billion in corporate subsidies — handouts that arrive in the form of tax breaks, export incentives, and pork-barrel contracts. These policies only harm competitiveness and increase taxes. Politicians are destructive people. They give us their money, then take it away in taxes as well as our freedom in the marketplace. That's the game." (Wired, August 1998: 87).

The Silicon Valley's entrepreneurs realised that the Agency model backed by government subsidies as a form of "corporate welfare" was a device through which money would have been taken from their left hand and returned to their right hand, but with much dead weight loss along the way. In other words, they got a full understanding of Jean-Baptiste Colbert's famous statement that "The art of taxation consists in so plucking the goose as to obtain the largest number of feathers with the least possible amount of hissing".

In all the time that has passed since the Roosevelt's Agency model was created, an increasing effort has gone into examining abuse of discretion by Agencies. What has been pointed out is that lines between legislation and execution are not clear. Agencies operating under clear congressional guidance are not necessarily more competent and reliable than free agents that are governed by comparatively open-ended market guidance. "The essential problem of regulation, which amounts to a constitutional problem, is that the Agencies act without a spending constraint" — as Christopher DeMuth of American Enterprise Institute aptly stated in the case of the Environmental Protection Agency (DeMuth, 1999).

Since the late 1970s, Congress and the federal government had largely avoided creating any new regional development body. By that time, the TVA was among the few holdovers from previous interest in regional development strategies. During the Clinton administration, Al Gore addressed this matter saying that the agencies will have to "justify why they should continue to exist at all"[17]. In America, by the end 1990s Gore's view was backed by politicians from all persuasions. Thus, instance after instance, the age of consent with a fair, stand-alone Agency-mother seemed to be turning to a sad ending.

Even so, in the past few years there has been strong support for the creation of new regional development organisations has come from federal economic development officials. What has caused the change of the policy framework — reports the National Commission on Entrepreneurship — is "the recognition that regions are the key unit of the 21st century economy... Most businesses understand that economic strength and prosperity are generated at the regional level". Regional development authorities are seen as the most effective response to the regional economy's priority needs of providing business services and technical assistance, encouraging private sector investment, and fostering entrepreneurship (National Commission on Entrepreneurship, 2002c).

3. THE DREAM OF A FAIR, STAND ALONE AGENCY-MOTHER: THE EUROPEAN EXPERIENCE

In Western Europe, the follow-up to the successful way clusters had been doing things within their communities was that policymakers were becoming increasingly sympathetic to the view that steps had to be taken to supplement clusters. They

[17] Quoted from Micklethwait, Wooldridge, 1997: 319.

held to be axiomatic that from a 'no-government' stance clusters had to move neither to 'big' nor to 'small' government, but to a 'clever' and 'effective' one. Which meant that a supervisory role in upgrading clusters (and even in their formation) had to be assigned to public bodies within the cluster communities, as it is the case of regional governments and similar institutions poised between the state and the market.

From that policy-specific ideology stemmed the idea of an economic development Agency as a joint public-private undertaking that lies between those institutions and the individual firm. The Agency's role is that of the implementer of programmes and policies on clusters designed by the policymakers in an effort to promote competitiveness, raise awareness of the importance of relationships among various industries, and foster more efficient and streamlined economic development programmes and policies.

What is termed the "Agency model" is a division of labour between the policy-making activities by public officials within the governmental offices and their implementation by the Agency's employees.

A cluster — the argument of the interventionists went on — is an atomistic economy where excessive competition hinders efficiency and therefore undermines profitable operations. Even though in the cluster environment the business culture is told to be more communitarian than individualistic, atomistic private producers cannot appropriate the external economies to which clustering gives rise. Conversely, within the Agency they could benefit from each other mutual support. In this respect, the Agency's principle borrows from the balanced growth doctrine of which it is a variant that says that undertaking jointly *n* projects "any one of them would be more profitable than the same project undertaken in isolation" (Hirschman, 1958: 55).

The interventionists perceived a cluster as a collective good to be protected by making explicit agreements between companies. Responsibility for provoking and enforcing those agreements lies with the Agency, which is the actor that creates a reasonable order in the cluster. In absence of this authority, self-interest would produce actions that might well be rational from the point of view of the individual company but could damage the cluster community. This view shows that the interventionists believed in a sort of control over a decentralized decision-making process to be vested in the Agency's hands.

Rooted in a common culture, social proximity or understanding, and often in a common political background, the Agency ought to aim at creating a shared discipline among local actors and building consensus around the mutual interest of competing firms in the market. Companies operating in the same or related businesses cluster would have learnt how to collaborate (in a broad range of ways, from co-ordination to co-opetition) in a network of mutually supportive activities. The increasing complexity of the enterprise requires more knowledge for intelligent decision, and more specialised information ought to be shared within clusters. Small, specialist family-owned companies need to maintain close ties with the market, develop new relations and be ensured that they are abreast of technological advances. The interventionists pointed to the Agency as the creative hand to afford all these tasks. Like a fairy godmother, the Agency should have been the repositories of received wisdom, charged with the task of strengthening the cluster economy and engaged in teaching small entrepreneurs how to carry out their businesses more easily and productively.

The ideal agency resembles a "social entrepreneur" that builds a 'constitution' for business confidence. Its foundations are built on co-operation not competition.

In practice, the Agency would have released business and technology development services to assist SMEs embedded in local clusters. Stimuli to innovation and local development through direct commitment and involvement of the private sector in the Agency's board of directors, promotion and construction of networks for mutual exchange of information between SMEs, networking with comparable agencies outside its own constituency: all these activities the Agency would have conceived and implemented thanks to the public authorities' strong interest in pooling resources to be turned in favour of the Agency. Indeed, the interventionists' auspices were that the Agency could have become the consummate body eligible for co-financing under various European, national and regional programmes. By tapping into the aid money these programmes would have received, the Agency should have been capable of increasing demand for services paid by the use of public funds.

This type of Agency turns into a matter of practical politics amongst those national and regional governments, mostly those ruled by centre-left parties. These players firmly believe that the formation of these Agencies is the first step in instigating growth through a mix of 'central' Keynesian macroeconomics and 'regional' interventionist microeconomic policies. They assume that liberal market-economy mechanisms are ineffective in inducing growth. Rather than arguing in terms of "the government does not know any better than enterprises what should be done about the economy. If firms were allowed to decide, they would find direction", centre-leftist thinking is that "economics tell us that whenever the market fails, the government should step in to eliminate that failure". The robustness of government is opposed to the fragility of markets (Posner, 1995: 413). Over the removal of obstacles to the exercise of choices by individual firms, lefting politicians prefer speaking about intervention on their behalf. In the Hirschman's terminology (Hirschman, 1958: 202), to "permissive sequences" those parties prefer "compulsive" ones, which are the

outcome of their active leadership by means of co-ordinate market-economy mechanisms[18].

A broad range of countries has already put in place policies to promote local clusters either to encourage local economic development or to ease the transition to a market economy. For the most part, tailoring economic policies to exploit local capabilities is a task pursued by regional and city authorities who deem their institutions flexible enough to be better able than national government to ensure that development policy is adapted to local needs.

In the early 80s the forerunner of this movement was one of the most advanced regions in Europe, namely Emilia-Romagna (Table 3.1). Its left-wing public decision-makers saw new opportunities in devolved government that established new tasks at the local level. Back in the 1970s, public policy pundits had reckoned that priority should be assigned to make the region's companies more suitable to

Militant leftist wanted a system of "petty capitalism", or small-scale private enterprise, where associational activities were the social manifestation of a spirit of collaboration among this kind of firm.

[18] A co-ordinate market economy "has a set of interlocking policies and institutions, which include long term relationships between companies and providers of capital, extensive collaboration between employers in the same industry, especially in standard-setting, vocational training and pre-competitive research, and a commitment by companies to equip their workers with firm-specific and industry-specific skills. Liberal market economies, by contrast, rely on market mechanism to regulate relations between companies and their workers, between users and providers of capital and between companies and their suppliers" (Hall, Soskice, 2001).

reinforce the dynamism of the local economy by reciprocal collaborative relationships.

Table 3.1

Emilia-Romagna: The economic structure of a cluster-region

• A population of 4 million and over 300 000 businesses.
• Enviable geographical position at the center of Italy's most productive area, with close links to the main European markets.
• Its standard of living is among the highest in Italy.
• Thousands of small and medium-sized companies.
• A dense network of small and very small artisan-type companies.
• With a company for every 10 inhabitants, regional levels of entrepreneurship are among the highest in Europe.
• An employment rate among the highest in Italy.
• A strong tradition for technical training.
• Its industrial system is noticeably diversified. The most developed sector is industrial machinery, where 25% of manufacturing industries and approximately 50% of the total regional workforce operate.
• Ferrari, Lamborghini, Maserati, Ducati are just some of the names that can be mentioned to give an idea of how concentrated the high-performance motor industry culture is in the region.
• Internationally renowned for the industrial district system: industrial clusters with hundreds of specialised and independent small and medium-sized businesses operating in the same sector, which collaborate, compete and are concentrated in demarcated areas. With sales abroad reaching 60% of turnover in some cases, the regional districts in some sectors (ceramics, food production, food-processing machines, packaging machines, machine-tools, etc.) are the most significant in the world, for a number of businesses, in volume and total sales.

• The sub-supply sector is one of the most developed in the country and it is vertically integrated with the activities of larger businesses.
• Some of Italy's most important universities and research centres are located in Emilia-Romagna.

Source: Cordis, European Commission.

In consequence, regional policymakers endorsed the arguments of a sound policy geared to give business support to a wide range of small- and medium-sized companies which were serving local needs with local resources. These are the fragmented and traditional companies we have been describing in Chapter 1, par. 4. As has been said, their location is as likely to be influenced by incidental or historical reasons as from the local availability of factors relevant to their business, including the closeness to their market. Public policy would have led to a great number of those companies becoming capable of a laborious and hard-working activity of local networks for engendering social and productive interdependencies, in the meanwhile upgrading some of them to the status of local leaders whose operations would have embraced international niche markets.

Public policy should aim at rewarding local SMEs with a high propensity to clustering. It should also raise the awareness and need to collaborate for mutual benefit among those who have made it a habit to operate in isolation.

The rationale for the regional government policy initiatives was the conspicuous assumption, however short on empirical support, that SME-oriented business development services were "under-provided by the market because of their highly developmental nature. The reluctance of the private sector to invest in the supply of [those services could have locked] an

SME cluster within traditional ways of doing business" (Clara 1999). To put it differently, there are circumstances in which the free market either does not provide the services desired by SMEs or, albeit when the services are produced, SMEs are subject to the exclusion principle because they cannot afford to pay for them. Each of these situations requires the interference of government. The Emilia-Romagna regional government stepped in conceiving a public action that was instrumental in catalysing joint public-private efforts, even bringing business leaders directly into policy-making through an Agency-shaped body. Civil society and the private sector represented by ruling interests and special-interest organisations were asked to become involved in formulating regional strategies and to translate their commitment into real actions more closely reflecting the local priorities as well as reconciling the objectives of economic competitiveness, social cohesion and environmental progress.

The decision to establish the Agency was made through the legislature, which in turn provided the funds through taxation. The outcome of this desire to intervene was the creation of common service centres for businesses, termed "Business Service Centres". As providers of specialist-added value 'real' services (i.e., the opposite of financial support or monetary incentives), the centres sought to give new life and energy to medium-size and smaller enterprises in single-product industrial districts. These services, as opposed to monetary incentives directly granted to companies, have been defined as "activities which generate structural rather than temporary changes in the organisation of production within a company. In other words, the use of such services

The associational attitude combined with the regional authorities' commitment brings to the establishment of business services centres to promote the SME collective advance of autonomy, innovation and competitiveness.

by a company facilitates structural changes such as process restructuring, product diversification or a change in the growth of the market" (Bellini *et al.*, 1990).

To implement that policy, the regional government's operative arm was its own Agency: ERVET — Regional Board for Economic Development [19]. This regional development Agency was established in 1974 with the mission of "translating regional planning choices into actions, designing and carrying out innovative projects together with the economic groups concerned". During the second half of the 70s, the Agency's main target was planning and building new business parks for micro and small companies. Later on, by the early 1980s, ERVET had turned its activity to the setting up of "a geographically distributed network of Business Service Centres tailored to the needs of the local economies... The Centres were created in collaboration with all the business associations operating in Emilia-Romagna, and their combined membership includes nearly 1 000 firms. The Centres offer members a vast and continuously update range of specialised services"[20] (www.ervet.it/) (Table 3.2).

---

[19] The regional government is ERVET's majority shareholder. Other partners are business associations, chambers of commerce, municipalities, and Banks (www.ervet.it/).

[20] "Taken together, the Centres and the parent organisation constitute the ERVET System. [Nowadays] the ERVET System consists of the parent organisation and eight specialised structures termed Business Service Centres: ASTER operates in the fields of technical and scientific innovation, technological innovation and information technology; CERMET is the centre for product and process quality certification; CESMA and DEMOCENTER serve the sectors of machinery manufacturing and factory automation; CERCAL and CITER for the fashion industry — in particularly, CERCAL for footwear industry and CITER for textile information; CENTRO CERAMICO and QUASCO serve the ceramics and construction

Table 3.2

The ERVET System's cluster-based initiatives

• Expanding local infrastructure, both physical assets and intangibles (educational and institutional development included).
• Transferring knowledge, information and technology.
• Setting up cluster specific education and training programmes.
• Adopting and sharing internationally accepted standards and management practices.
• Building supplier and distribution networks.
• Generating more export revenues.

industries" (www.ervet.it/). Entrepreneurs on the behalf of various handicraft and industry associations, and one representative of the parent company form the Centre's board of directors.

Recently, ASTER has been turned into a consortium between the Universities of the Emilia-Romagna region, the research centres, the regional government, the regional Chambers of Commerce and the main entrepreneurial associations.

The new mission of this agency — as circumscribed by the regional government — "consists of the promotion of industrial research, technology transfer and innovation in the region. Its main target is represented by both providers of knowledge (research world) and potential users (enterprises and institutions). ASTER collaborates with the former for the exploitation and spread of research results (also at international level), while to the latter it offers assistance in technology and knowledge transfer, thus enabling continuous innovation and increased competitiveness".

"In order to attain these goals, ASTER has been appointed to create and support the network for technology transfer, also by the offer of services, the launch of projects, the realisation of research contracts and strategic technology. Target audience: Research bodies, enterprises, institutions".

• Exposing local small businesses to international contacts and practices.
• Fuelling additional entrepreneurial opportunities and supporting would-be and new entrepreneurs.
• Realising more wealth and more disposable income into the economy.

Together, the parent company (ERVET) and her offspring (the Business Service Centres) constitute a network whose nodes (the Centres) are firmly fixed into the regional fabric of the cluster communities. In the business-services industry, the net-shaped Agency operates as a market actor, an observer and, often, the hidden regulator through the management of subsidies, other public endowments and entitlement programmes required to make provision for delivering business services. The regional authority largely funds activities of which none can truly be termed "profit-making". In the case of ERVET, public funds have been going to the parent company and then Service Centres have been bidding for funding from it. The remainder of ERVET's finance has been generated from European funds, through service charging policies and some small contributions from partner organisations.

Subsidies are distributed according to a grand plan worked out in the regional government.

Some Centres serve national markets and a differential pricing policy operates for services outside the region where the guiding principle is entirely revenue generation. This sort of financial mechanism likens the economic and institutional governance of the ERVET system to a Russian matriushka, with service-centres levels of governance embedded in ERVET, and this, in turn, in the regional level of governance.

The Agency's double or triple role influences the buying and selling decisions. That triggers off a process of reflexivity by

which the very act of observation forces interaction between buyers of business and technology development services and the Agency. The former are 'persuaded' to address their demands to the Agency. The Agency's role as a high-powered arsenal distributing a variety of public handouts produces a powerful me-too attitude among potential buyers as they compete for resource and support.

The Agency is a big, all-powerful and all-bountiful mother figure watching over the cluster.

Ultimately, it is ERVET the prototypical quasi-governmental Agency 'putting-government-into-business' of which interventionist policymakers have been dreaming to divide rise above the cluster economy as the fair, stand alone mother who knows better than customers what ought to be provided and delivered to them.

4. THE AGENCY'S FLAWS

For some, the Agency is like a public servant that drives a machine for subsidies ('passing the hat round the government'); to others, it is a business organisation chasing opportunities in the marketplace. Consequently, the Agency has two contrasting personalities among his managers: namely, "political entrepreneurs" — the warriors of subsidies playing guanxi[21] with

[21] "Guanxi" means to care for each other. In the Chinese business context, guanxi (usually translated as "connections") means that first businesspersons negotiate a relationship and afterward a contract. As the popular saying goes, "guanxi greases the wheels of all contact between people in China". "Guanxi conjures up images of karaoke outings with officials, nods of understanding in smoke-filled rooms, and the invisible hand not of the market, but of influence" (The Economist, In praise of rules, Survey of Asian Business, April 7th 2001: 18).

bureaucrats in public administration, and "market entrepreneurs" — the warriors of markets who take risks. Whereas the former in collaboration with interest groups have an underlying interest in fighting for the control of subsidies rather than for deploying and directing their efforts towards profitable business, the latter are engaged in productive activity.

Regulatory constraints and inspection charges have become a massive and relentless force placed by government officials on the Agency. Unfortunately, there are no outward signs of careful scrutiny and oversight of the Agency's style of management whose findings, in turn, could shed a clear light on the Agency's process of providing services. Key questions include: Are business propositions evaluated in business terms or settled politically? Are unsustainable practices encouraged by the Agency? Is the provision of subsidised services an effectual practice in terms of triggering a learning process that helps firms to appreciate their value so as to switch later on (by the time the learning period is exhausted) to service provision on a self-funding market basis? Are benefits from the Agency's intervention higher than costs, and how are benefits and costs distributed? Are performance targets used which are built into a market perspective? Is there an innovation performance of the Agency — that is, the relative success by which, thanks to its activities, companies seek out and adopt new processes and products)? To questions like these, answers are not easily given or understood, apart from a long chain of signs, clues and idiosyncratic rather than exhaustive evidence. As a result, the burden of

With the agency sitting astride the public-private fence, it is difficult to discover who awkward to find out who really makes decisions for the services the agency provides.

proof concerning by what standards the agency ought to be judged remains ambiguous.

On one hand, there is a lack of a set of standards to be prescribed in legislation. Authorities ought to set out broad outlines of 'best value' — that is, good value for money — regime for provision of business services. The process of best value would allow the decision-makers to evaluate how the Agency is carrying out its activities and which back-up alternatives are open to public scrutinity.

There is a paucity of research on the Agency's performance which is due to a pathological bond between researchers and Agency. The incentive for researchers is to tell people outside the Agency what the Agency wants to hear.

On the other hand, performance and benchmarking exercises are either bland descriptions or practitioner reflections which produce a mere list of wishful thinking. Serious analysis based on a formal heuristic model[22] is rare.

Lack of hard data is certainly an impediment to such research, but the overriding concern is the conflict of interest that devel-

---

[22] The end result of the most common approach is represented by statements like this one: "The Italian regional development agency ERVET has shown that through its Service Centres in the industrial districts of Emilia Romagna the co-ordination of the relevant actors at the local level (local administrations, business associations, Chambers of Commerce, trade unions etc.) can be flexible and responsive to changing needs, while at the same time enabling a strategic function to be exercised" (Best Practices in Strategic Support Services for SMEs, Final report of the Athens seminar 15–16 May 2000). For the alternative approach, see the scrutiny of the Illinois Department on Aging (IDOA) by Koremenos, Lynn, 2001.

ops as research teams and analysts simultaneously supply advice to the Agency, curry favour with management and carry on research into how the Agency is run. In the past this has hampered the production of high quality research by local research teams familiar with the language and corporate culture of the Agency management. To retain control of impartial and objective research, there is a need for research organisations, preferably of a cross-border character, whose moves, whichever way one looks at them, are a step backwards from any sort of Agency influence. But there is still an open question as regards ways and means needed to finance that scrutiny by researchers eager to delve deeper to discover the real performance.

More general findings are, however, available about the impact of public policy on cluster development. Empirical data from a survey on clusters carried out in 1999 by Michael Enright "suggest that one should be circumspect with respect to claims of dramatic impacts of policy on cluster development... Although there are a number of examples of successful government programs that have supported cluster development, efforts to assess the importance of various cluster development policies across existing clusters indicate that, on average, government policy tends not to be considered to have contributed a great deal... on average, none of the policies assessed was considered to have

The findings call into question the achievements of public policy on cluster development. The more researchers investigate the performance from the demand side (i.e., from those who benefit from policy intervention), the less encouraging the results become.

even had a moderate impact on the competitive success of the clusters in the sample" (Enright, 2001)[23].

Table 3.3 reports Enright's finding in the area of business services, which are often the focal point and the most sensitive one of the Agency's intervention. The data highlight the poor impact of government policies[24] or, at best, show a large indirect part of state support in cluster development — as has been found in another survey conducted in the USA (Poole *et al.*, 1999).

Apart from those evidences, there are also clues that cast a shadow over the Agency's claim to be a positive instrument of economic intervention. Indeed, they throw the spotlight on the potential for abuse and poor incentives by the Agency.

---

[23] The author points up that the survey was addressed to "individuals knowledgeable about particular clusters and cluster initiatives. A total of 160 usable responses were received, with a geographic breakdown of: Americas 39, Europe 65, Australasia (including Asia, Australia, and New Zealand) 52, Africa 4".

[24] Enrights argues that "there can be a variety of possible reasons for this finding. One is that cluster policies have emerged only recently and take time to have an impact. Another is that most of the clusters that exist developed without any particular policies for cluster promotion. Yet another is that policies have been less important than other features of the clusters". He concludes that "more work will be necessary to isolate the precise implications of these results". By the way, data corroborates Peter Drucker's famous dictum that warfare is the only example of a modern government programme that has achieved its objectives.

Table 3.3

Assessment of government policies in the provision of business services for cluster development

"Please rate how important government policies in the area of business services have been in promoting the development of this particular cluster".	
(Very Important = 5; Important = 4; Moderate = 3; Unimportant = 2; Very Unimportant = 1; No Policy = 0; Negative Impact = −1).	
Provide business services	**Mean**
Provision of technological services	2.02
Contract research and development	1.58
Contract market research	1.42
Contract accounting and other firm infrastructure services	0.55
Other services	0.52

Source: Enright, 2001.

First, most Agency-aid efforts, however well intended, have the practical effect of insulating the cluster economy from the shock caused by a wave of radical innovations. In the face of changing times, "every organisation — Peter Drucker (1992) wrote in the "Harvard Business Review" — has to prepare for the abandonment of everything it does". By contrast, the Agency's stategy is that of protecting the economy from such a shock, reinforcing the collective attitude to invest in the best people and resources in an attempt to defend the old. The protection from the inevitable devalues the cluster's ability to be prepared for a "tectonic shift in [its] economic

The risk of ossification of the cluster economy is amplified by the Agency policy that pursues incremental improvements within the cluster's traditional attributes, rather than promptly responding to radical shifts in technologies and products.

base" (Peters, 1994) Once the Agency's money runs out, the cluster economy is weakened further because core competencies — the talents, skills and tradition that made for its competitive advantage — have been degenerating into core rigidities.

In many ways, intermediary Agencies behave like medieval guilds. The guilds operated a closed system with rules and regulations which usually guaranteed compromises between its members by suppressing competition. Members are a closed group, 'those-who-know', who settle for protection of their established rights and continuity, and shy away from breaking new ground. A ritualistic adherence to those rules instigates a sense of disengagement and insensitive to changing needs. This means that inasmuch as innovation decisions are concerned, the Agency's guild-mode holds back the development of innovations that in the foreseeable future might be the cause of severe damage to the interests of members. The Agency thereby affects the pace of the cluster's development by favouring innovation that is attuned to the members' vested interests — that is, incremental innovations rather than disruptive ones. The former are the glue that binds together the Agency's diverse constituencies. Conversely, as we know from Schumpeter (quoted from Hirschman, 1958: 57), the latter would lead to completely new products and services that might cause losses to existing operators because the radical type of innovation would "render painfully acquired skills useless and valuable equipment obsolete". On the whole, the Agency's guild-mode deflects entrepreneurs from the promotion of innovative start-ups to safe investments in satellite industries. Too often ventures in trade and real estate are preferred to manufacturing innovation.

The agency exercises a kind of control over the type of innovation to be pursued in the cluster.

Second, the Agency's policies and intervention are driven by some form of financial "intervention index"+[25]. The subsidy-led Agency[26] distorts the market by deflecting business from its primary role of risk-taking investment for profit generation[27] to the search for grants and subsidies. R&D subsidies alongside regional aid account for the largest part of the EU national governments' assistance to the manufacturing industry. Due to a barrel of economic incentives frequently with the EU label attached to it, the Agency can exercise the 'soft power' to persuade rather than the 'hard power' to coerce companies to want what it wants: precisely, that large areas of supply of business services remain outside the market economy. Not least because the intrusive presence of the Agency in the business- services market, small family firms, which lack in knowledge and experience needed to attract additional resources for innovation, may have no choice but to participate in the Agency's pro-

Allowing the agency to keep a tight grasp over the cluster economy through control of public funds, policymakers have set themselves against the possibility of competition between business service providers and the choice for clients that is its natural consequence.

---

[25] The "intervention index" is the sum of endowment funds (often hidden behind a facade of targeted projects), subsidies — general, selective and specialist grants, and other handouts as a share of the private sector's capital spending, research expenses and alike.

[26] From now on, we shorten to subsidies the cornucopia of public provisions.

[27] OECD research and analysis show that the elasticity of a company's fund to subsidies reach a maximum when the fund-subsidy ratio is equal to 15%, then the elasticity start off with falling sharply and is equal to zero once subsidies attain 30%.

grammes. Participation is the sole way to obtain 'needed' government support. They have to apply to a bureaucratic Agency for the 'right' to innovate, thereby competing for handouts from the Agency and not for customers. By all accounts, the regulation of the market steadily grows.

The presence of the Agency in the business-services market saps the entrepreneurial capacity of small family firms in particular.

Third, the Agency suffers from financial mismanagement — often the end product of the previous weaknesses. The efforts of regulators to enforce stricter financial then enmesh the Agency in endless budget report-writing to justify past actions. Generally speaking, heavy bureaucratic guidelines and procedures embracing institutional and procedural details are a by-product of the increasing dependence of many local and national Agencies on funds set up by the supranational bodies such as the EU Commission and managed by their internal non-accountable bureaucracies. Consequently, the Agency's "outside contractors have to wait months for payment. Moreover, the Commission frequently pays well below the market rate for work. This encourages [the Agency and its contractors as well] either to deliver a second-class product, or to exaggerate the hours they have worked. An increasingly inefficient system produces a culture in which bending the rules is taken for granted" (Peel, 1999). To bend rules or otherwise to manipulate them, leads to abuse and the toleration of abuses. The more that regulators impose detailed rules rather than a general set of robust principles in order to avoid scandals, the more the Agency directors and executives will settle for fulfilling the

Supranational bodies like the EU Commission use a mixture of monopoly power and bureaucratic authority to force rates down and payment periods and extend payment periods. This can easily degenerate into fraud, prompting yet more regulation and scrutiny.

letter of detailed prescriptions, without thinking of the broader ethical purpose they serve. Encouraged to concentrate on complying highly prescriptive rules, they fail to capture the economic substance of the Agency's activities. Interventions from a distant bureaucracy (e.g., Brussels) produce a highly opaque, unpredictable and time-consuming process and prevents timely and efficient allocation of resources.

Fourth, the management of public funds by the Agency shapes a pattern of behaviour which degenerates too often into a bargaining process between Agency executives and high-ranking public servants on one hand and organised economic groups on the other. The seemingly inevitable outcome is an invitation to covert collusion and insider dealing to get rid of competitive bidding. What Agency functionaires have to sell is 'influence'. Established interests deem that time is better spent behind the scenes, negotiating and deal making with the Agency rather than running the business. Each group, lacking encompassing interest in the general economic performance of the society, presses for its own share of subsidies. None will relinquish any of what it has already got. This is a recipe for paralysis as the Agency finds it hard to cut down current activities which are familiar to subsidies-minded lobbying groups. Pork barrel economics overwhelms entrepreneurial economics. The Agency's whole system twists around a sterile bureaucracy[28].

Successful marriage between interest groups and government contains the seeds of downfall because it turns into crony capitalism.

Fifth, the government exercises financial influence on the work of the Agency, which thereby is bound by governmental

[28] This type of behaviour is familiar to the Soviet-type, statist societies. Yet even in co-ordinate market democracies, the builders of the Agency model face similar pressures (Olson, 2000).

decisions regarding implementation of its functions. The consequence is that the Agency is forced to turn to local politicians for additional funds while new governmental programmes require the Agency to reinvent itself repeatedly. Increasingly Agencies become subject to the whims of political favouritism rather than client need or market demand. Political interference brings about a huge overlap between party politics and the Agency. There is an umbilical cord connecting elected legislators and senior civil servants to Agency directors and executives which may detract the latter's ability to enhance performance and seek real opportunities.

Most worryingly, the positions of chairman of the board and other key roles are often not advertised. Rather, Agency directors, executives, project co-ordinators and codifiers, enmeshed in red tape, are approached informally by political factions and asked to take on the job. They are invariably drawn from the ranks of political parties or collateral to them.

The appointment process is far to be open and formal. The legitimacy of the board in terms of representativeness and effectiveness of its members is questionable.

There is a widespread concern about the influx of these individuals as political advisers into the government, especially if they have never really had a proper job. Indeed, most of them either remain within a single Agency during their entire career or move from one Agency to another, or become civil servants, never experiencing a real diversification of their career patterns (Peters, 2001: 224). At any rate, a form of "negotiated corporatism [29] (Table 3.4) will prevail in which unaccountable power and concerted actions are shared between politicians, public officials, former government and party functionaries

[29] See Illustration 2 for the definitions of corporatism and the different variants it can take, in addition to the one in the text.

employed by the Agency and the most activist self-interested parties entrenched at the top of the subsidies' mountain. Symbiotic relationships between them impair the efficiency operation of the economy. The effect is to compound the problem of aligning Agency behaviour and market signals. 'Correct' market signals are distorted by defects in the behavioural signals both by the Agency whose code of practice is dictated by partisan politicking and by the interest groups that become more inclined towards the way of acting of the Agency than to the needs of their members.

Table 3.4

Definitions and variants of corporatism

Definition

Corporatism is a rather extreme version of the legitimate relationship between interest groups and government in that it tends to restrict the number of interest groups involved in the policy process (Peters, B. G.).

Corporatism is an arrangement characterized by a "limited number of singular, compulsory, non-competitive, hierarchically ordered and functionally differentiated" groups that are given a virtual license to represent their particular area of competence (definition put forth by Schmitter, P. quoted by Peters).

Forms

"Societal corporatism".

- Interest groups are the leading actor of policy making (Schmitter, P.).

"State corporatism".

- Government is the dominant actor (Schmitter, P.).

"Liberal corporatism" or "corporate pluralism".

- A less formalised relationship between interest groups and government.
- A more intense negotiation among the groups themselves during the process of policy making (Lehmbruch, G. quoted by Peters).

"Meso-corporatism" or "negotiated economy". • Less restrictive variations of the general pattern of relationship between the public sector and organised, private interests (Peters). "Negotiated corporatism". See the text above.

Source: Peters, 2001.

Last but not least, under pressure from political parties and as the Agency adapts to their needs, sharing the spoils becomes more important than building value. The Agencies increasingly rely on unfair practices to prevent its current and potential rivals from competing+[30]. Private sectors alternatives are stifled or crushed by the mixture of subsidies and special privileges. Under a subsidy regime, government officials as regulators are often captured by the Aency being regulated, so that regulation instead of promoting competition creates government mediated barriers to entry, which 'entitle' the agency to act like a private monopoly in the business services industry. In principle, by retaining the right to intervene in the Agency's decision process and,

There is an increased ability for the Agency to go its own way.

[30] In countries like Italy, the rule by political parties (*partitocrazia* in Italian jargon) and the practise of *consociativismo,* that is of having all political parties — whether in government or in opposition — work together to cut deals on every issue and sharing the spoils, have been extensively put to practical use at all levels of government. For these political conditions, if for no other reasons, the intellectual theorising about the agency and its applications provokes mixed feelings, a greater concern and, sometimes, a fall or descent into contempt.

hence, by limiting delegation, the regulator could reject projects that would enable the Agency to exercise a monopolistic power. In practise, by distorting the information transmitted to its principal, that is the regulator, the Agency can seize the opportunity for minimising the negative influence of restrictive rules and regulations imposed on its autonomy, and maximising the chance of getting the mix of funding sources (i.e., the mix of grant, membership, earned, sponsorship or other income) which meets the needs of its monopolistic stance (Marino, Matsusaka, 2001).

All in all, the Agency is to some degree influenced or controlled by non-commercial actors — if not politicians, then bureaucrats. This administrative guidance is given partly informally, partly through political and bureaucratic control of the access to public funds, and partly by means of regulation. Through the leadership exercised by government officials and interested parties, the Agency is a secretive and unaccountable organisation that thinks "inside-out" rather than "outside-in". It looks like the modern version of the "medieval manorial economy" (Henderson, 2001) whose dependants were treated as supplicants for protection and privileges from their lord, who was entitled to define the broad interest of his realm.

The quality of this type of leadership is a pivotal factor that jeopardises the long-term cluster sustainability.

Even investigations of restrictive practices are unlikely for it is "an accepted political convention that the judiciary should be left with a minimum of contact with issues of public law where aspects of policy are most obvious" (Stevens, Yamey, 1965: Chapter 3). The Agency thereby can easily degenerate into a board of arbitration concerned with adjusting disputes between the interested parties instead of responding to issues at stake raised by market participants. For all these reasons, it is only a matter of time before a dread malaise permeates the Agency, which changes into an iron cage a bureaucratic machinery that

stifles entrepreneurship. Bureaucratization is an impediment to responding quickly to environmental challenges. As a consequence, clusters that are plagued with frequent Agency problems as in those pointed above are unlikely to act flexibly in novel situations.

5. THE AGENCY'S CORPORATE GOVERNANCE: AN ISSUE OF EVER-GROWING IMPORTANCE

According to the "Draft Guidelines on Corporate Governance for Public Comment" issued by OECD, "Corporations must seek to create sustainable competitive advantage to meet the expectations at large of their shareholders, as well as their other contractual partners, such as employees, customers, creditors and suppliers, and the communities and societies in which they operate. Corporate awareness of the broader environment in which the firm operates can have a significant impact on the reputation and the long-term success of the company" (www.oecd.org/daf/governance/guidelines.htm).

> *Corporate governance generally refers to the process by which organisations are directed, controlled and held to account. It encompasses authority, accountability, stewardship, leadership, direction and control exercised in the organisation.*
>
> *(Australian National Audit Office, 1999)*

Good corporate governance enables society to administer public goods effectively and to resolve any problems equitably — argue OECD economists. Good corporate governance is a key factor in building a robust Agency capable of securing sustainable growth and prosperity. A sound governance helps to ensure that the Agency uses its resources more efficiently, leads to a more competitive cluster and better relations with shareholders and stakeholders, and enhances the confidence of its client-companies.

Although the present corporate governance springs up as the Agency's most critical point, so far this important issue has been neglected. Government officials tend to be conservative and generally support the status quo on governance. Yet, the increasing range, numbers and powers of transnational, national and local Agencies demand cultural change to alter the ingrained traditions of opaque, largely unaccountable (to clients) governance. People who find it difficult to comprehend the decision-making will neither participate nor benefit.

As for the corporate governance of the Agency, what is known is little more than aspirational or idealistic statements of good intentions. Generally speaking, the governance of the agency stands outside both the structure of democratic accountability and the disciplines of the market.

A vital test of a good corporate governance system is whether it provides clear rules of merit to ensure that under performing managers can be fired. Unfortunately, under the present circumstances it is hard to say how properly Agency managers are doing their jobs.

Selected by political parties with the complicity of organised economic groups, members of the board and executives are given very little power to act on their own initiative. Directors are often appointed on a part-time base, which do not allow them much time to attend meetings, and those in non-executive positions are spuriously independent and they are not paid enough to devote proper attention to the job. So, rather than dynamic drivers of a corporate performance needed to encour-

A corporate governance system is the "set of incentives, safeguards, and dispute-resolution processes used to order the activities of various corporate stakeholders" such as owners, managers, workers, creditors, suppliers and customers.

(Kester, 1996: 109, quoted from Guillén, 2000).

age investor confidence in the Agency, directors and managers are only formal supervisors of the Agency's activities dictated by the vested interests of political and pressure-group shareholders and stakeholders. Since there are no performers, poor performers cannot be penalised or dismissed.

Innovation enables clusters to develop and maintain their position in the value chain at various geographical levels, from the local economy to the world arena. It follows that the Agency's corporate governance has to come to terms with a threefold dimension of resource allocation for innovation: strategic (what types of decisions are made), organisational (who makes decisions) and developmental (how benefits are generated and distributed). This perspective sheds lights on 7 distinct standpoints for good corporate governance. They are:

1. The Agencies require systems of corporate governance that pursue the following values:

- All activities are conducted to the highest ethical standards and measures of social responsibility with clear and accessible codes of practice.
- Specific actions are subject to criteria that ensure that they are fair, responsible, and proper.
- Managing and utilising diversity are embedded as keys to business success.
- The responsibility, authority, training, and tools necessary to make decisions is given to the people closest to the internal or external customers.
- Clear and publicly accountable responsibilities are assigned.
- Initiative and a 'can-do' attitude are welcomed.
- There is a clear focus on needed outcomes to achieve the substantive goals of the Agency.
- An internal climate where prudent risk-taking is encouraged, alongside the development of critical faculties or

"cognitive conflicts", and mistakes are used as tools for constant improvement and creativity.

- Effective, honest, and open communication is encouraged among all employees, business units, and customers to improve Agency effectiveness.
- A board of clearly independent directors, neither chosen by the chief executive office directly nor through the influence of partisan politicking. When directors are on a board they are there precisely as directors of that company and should not have the interests of any other body in mind. Nor should there be ties between the directors and the management. Otherwise corporate governance would be impaired.

Independent directors, who are appointed independently of political considerations, would contribute to dilute the political control of the Agency.

- The board is conceived as a team united around a common purpose, and thus limited in number to around 10–12 people, all of whom are sufficiently motivated and committed to their task to devote the necessary time to the job. So the board should not be dominated by political shareholders. Governance structure based on the tenets of political representation has often provoked two casualties: on the one hand, an attitude towards a corporate conduct for which inappropriate links, cosy arrangements and currying favour with politicians and party functionaries have been the traditional deal-making habit of the Agency; on the other hand, a board too large to be fully efficient, and sometimes lacking in the necessary breadth of skills which are needed.
- Rendering members of the Agency's auditing panel genuinely independent and internal auditors more pow-

erful so that they can withstand the pressure from the board and stop rubber-stamping decisions taken by it. Auditors must observe ethical as well as technical norms. Paid consultants (for the Agency) should not sit on the audit committee.

Accountability means the requirement of those who in the Agency or other kind of organisations hold the power to render account both to their constituencies and themselves and to explain what they are doing and why.

2. Executives should be held accountable[31] by strong, not easily influenced directors as well as by a supervisory and an advisory board formed by autonomous experts. At present, there is rarely, if ever, an opponent on the board who can act as a spokesman and a "level the playing field" for shareholders who do not agree with management.

Effective Agencies require clear lines of authority between independent-minded board members prepared to determine independently the critical role of the Agency, and those executive and operational staff responsible for key tasks. These lines of authority should encourage entrepreneurial attitudes within the organisation, and a willingness to adapt to change.

3. Board arrangements should define the roles and responsibilities of the chairman and the chief executive, policies concerning the use and the appoint-

[31] "Accountability ensures that power holders have some idea of what they are doing and why. If they are no longer required to explain this, if accountability diminishes, then they also tend to lose an understanding of what they are doing. You can see this phenomenon all over the world" (statement by Karel van Wolferen, director of the Institute for Comparative Political and Economic Institutions).

ment of non-executive directors, formation and role of the audit committee (if any). What is crucial is a clear-cut distinction of role between the chairman and the chief executive — the chairman's job being that of a non-executive who manages the board, and the chief executive's one that of running the business. In addition, the boardroom should be enriched with the new blood of a strong independent deputy chairman to act as a counterweight to a chairman with a wealth of experience.

4. The board of directors should open up channels of communication with the market. To do this, the board should encourage interactive processes between the Agency and the local community through which it can listen to the market. Rather than being confined to organised groups, membership of individual firms should be unrestricted.

5. The board should facilitate provisioning and delivery of business and community services by making more use of market forces and the private sector. Local employers should be actively engaged in working with the Agency to find innovative solutions to issues addressed to economic development, including topics related to the broader habitat in which the firm operates — like transport, education, and the environment.

The Agency should rely on leaders at all levels of the local community who continuously strive to exceed the goals set and energetically communicate the vision.

6. The Agency should aim at desirable collective outcomes. For this, the Agency should nurture social capital based on networks and mutual recognition of worth between governmental bodies, corporate entities and civil society. Gathering together all these players, the Agency would give rise to a broader involvement in governance. The current situation mirrors a board in which there are directors whose "relationship shares" and collusive arrangements with government are large enough to

give them a controlling influence, or who hold several appointments whose interconnections increase the control over the Agency by a few hands.

7. In a fast-changing world, the Agency should be quick and flexible to innovate and adapt its corporate governance practices, so that new demands can be met and unleashed opportunities grasped.

So far, throwing the spotlight on the Agency corporate governance we can see that its code does little to nudge corporate governance towards a more client-friendly model. The Agency ought to adjust its thinking and become more transparent that it has been up to know. Therefore, new standards such as those listed above should be established by the Agency or, if it does not intervene, the government should do this.

6. SHARE- AND STAKEHOLDERS

With a spectrum of shareholders that embraces regional and local authorities, a variety of business associations, interest groups and even companies, the Agency's goal swings from maximizing the benefit for the community as a whole to supporting short-term private interests rather than long-term public ones.

An area of controversy is whether the Agency should be run in an attempt to mediate between shareholders' different interests or, on the contrary, ought to forge even closer links with a disparate array of stakeholder groups — defined as those from workers to customers who have a stake in the Agency. According to a fully-fledged stakeholder model, "those who are significantly affected by decisions should participate in making them" (Joseph, Parkinson, 2002: 54). To advocates of stakeholder value, "stakeholder inclusion leads to better long term business performance — including increased economic value for shareholders". Stakeholders are outsiders that provide new

insights (which spur the agency to an outward-looking culture) or dissent (which makes Agency executives less resistant to criticism). Should the wider interest of stakeholders be neglected, the Agency would risk suffering more from clashes in the working cultures of such different entities involved in it — which diminishes the effectiveness of its organisation. So, the need for an integration processes. Even though stakeholders were excluded, their influence on the Agency would still be there without their taking responsibility for the effects of their actions. All in all — goes the argument of those advocating stakeholder inclusiveness — it is better to have stakeholders in than out.

From this cherished argument the advocates of stakeholder inclusion draw a tenet which says that "the development of loyal, inclusive stakeholder relationships will become one of the most important determinants of commercial viability and business success". The stronger the stakeholder relationships, the higher the value for shareholders (Wheeler, Sillanpää, 1998).

The critics of this school of thought hold that the creed in stakeholder values is music to the ears of Agency executives who have to pay attention to needs and claims of a broad range of 'stakeholder species' that populate the Agency's habitat — namely, elected and appointed officials, civic institutions, interest groups, professional organisations, the media, agency employees, contractors, clients, creditors, et cetera. Forces like these always yearn for and demand a voice in running the Agency.

The debate is as follows: Should stakeholders be put on an equal footing with investors or, even worse, stakeholders first and shareholders last, Agency managers would be made responsible towards everybody and, therefore, towards nobody. Instead of being forced to take unpalatable decisions, managers could please everybody in the meanwhile that they were

putting into practice what the economists call "agency theory" — that is, the proposition that they seek to maximise their own power and remuneration. Each stakeholder too would tend to maximise its own opportunities instead of attempting to develop together with the other political and interest groups a cohesive culture and a coherent mission for the agency. Consequently, power games would take precedence over performance targets. What is more, by their innate instinct to stepping into rivalry and power games, warriors of subsidies are those who mostly would profit from this genre of governance. Conversely, warriors of the free market would see their authority degraded.

What the Agency really needs — as this sort of criticism has been voiced — is a clear line of authority by an independent-minded board prepared to determine independently the critical role of the Agency, attain a considerable degree of freedom in tackling the pertinent tasks, encourage the entrepreneurial attitude from within its organisation, and, last but not least, enforce change on managers stuck in their own thinking and working practices. It is contestability (i.e., "the ability for shareholders to be able to change managers if they are not doing a good job") which can ensure that the Agency meets new demands and seizes new opportunities in the marketplace (Micklethwait, Wooldridge, 1997: 208).

The most effective way to lock in stakeholders is allowing them to harvest business opportunities bred by the Agency and to benefit from the positive feedback effects of unfettered markets, without raising the risks of the stakeholder-style governance. Unencumbered market democracy gives stakeholders "access to information necessary to fulfil their responsibilities", as the OECD Draft Guidelines on Corporate Governance recommends, leaving them free to make their own choices. This does not mean that the promotion of freer markets is the

perfect solution, but those critics seem much more sceptical about alternatives like the stakeholder model of governance.

On one hand, those who advocate a shareholder model tend to stress that Agency directors and executives ought to be protected from the whip hand of the politicians, who, in the guise of dispensers of governmental endowments, want to take decisions on their behalf. In so many circumstances a curious aspect is that what is resolved by parties officials largely overcomes what is a matter for managers. Hence, shareholders should challenge politicians whose aspiration is to hold managers to ransom through their control over public expenditure.

On the other hand, shareholder advocates would be inclined to include employee representation on the Agency's board, were representatives of the employees to be settled on the board in order to rethink the present hierarchical system of command-and-control. As much as and even more than other organisations, the Agency has to release the entrepreneurial hostages held in its own hierarchy. One observer has pointed out that nobody better than the employees themselves might bring into the boardroom the viewpoint that "Placing all the power at the top means putting senior managers under enormous pressure, while reducing those at the bottom to automata — which, of course, does not allow to change a jobholder into a businessperson"[32].

Convergence of interests between shareholders and employees spotlights the presence of an economic stake that should enable the Agency to draw its own identity from the business world and, thereby, to ally itself with pro-innovation and free market businesses.

---

[32] From Victoria Griffth's interview to IBM's Laurence Prusak, Financial Times, 10 November 1998.

There is no single model of good corporate governance, and corporate governance practices are not a bed of roses. The Agency cannot evade decisions that are bound to determine the course of its performance for years to come.

7. IN PRAISE OF THE COMPETITIVE IDEAL: THE AGENT MODEL

There are two schools of thought in the debate on the Agency model. One says that there is a need for a veritable revolution because the practice of competition has fallen far short of the ideal. The alternative view is that we should attend to the weakness of this unique body, not throw away its distinctive character. Critics are better at identifying what is wrong than saying how it should be put right.

Decades of tradition cannot be expunged in a few years. The Agency has easily taken root in the ground of a "Nash equilibrium"[33], albeit one which is inefficient. "There are many Nash equilibria — John Kay has noted — and the better ones should be preferred to the worse. Still, it can happen the other way around" (Kay, 1998a). The Agency is grossly inefficient but holds a dominant position in

Nash equilibrium implies an outcome in which everyone is doing what is best for them, given the choices which have been made by everyone else. Each person's best choice will not necessarily lead to a collectively optimal result.

[33] John F. Nash, 1994 Nobel Laureate, developed an equilibrium concept for non-cooperative games that later came to be called "Nash equilibrium". He introduced the distinction between cooperative games, in which binding agreements can be made, and non-cooperative games, where binding agreements are not feasible. In a Nash equilibrium, players all fulfil their expectations and their chosen strategies are optimal.

the subsidies 'market'. The interaction between the Agency, on one side, and special interest groups and companies, on the other which are current or aspiring beneficiaries of subsidies manoeuvred solely by the Agency, must be regarded as a non-cooperative game where the influence of each player on the others cannot be ignored. So, each party in question has to consider other parties' reactions and expectations regarding their own decisions. By "strategic interaction" everyone is aware that learning and using the Agency's mechanism is the most sensible thing to do given the choices which have been made by everyone else. Each player, understanding the strategies of the other players, cannot improve his or her position by making an alternative choice. The outcome is that all are stuck together with an inefficient Nash equilibrium.

Notwithstanding, harsh decisions have to be made. To go along with the rationale of good corporate governance seems unlikely by itself to force the cultural change needed to reverse decades of public protection and economic privileges. The core concepts and principles underpinning the Agency model ought to undergo considerable revision. Most profound and critical changes in market conditions should be an opportunity for radical reform, not a plea for politically opportunistic change. A virtue ought to be made of the necessity imposed by new market conditions for a genuinely radical reform. Oddly, the question of the Agency's structural reform is a red herring. Only a small proportion of the Agency problem is truly structural. The rest is the lack of a policy climate that really favours pluralism and competition over the Agency's monopolistic, sheltered stance.

The Agency must be removed from the political arena where the dominant, invisible hand not of the market but of influence jeopardizes vitality, co-operation and competition, and experimentation that are essential features of the cluster as a market economy. This entails cutting down the subsidy-based govern-

ment involvement in the delivery of business and technology development services.

The job of government should be that of questioning all aspects of service provision by exploring the way competition can be used to improve the provision of business services. The Agency should compete directly with the private sector for funding.

Current and potential rivals can contest the Agency's dominant position as barriers to entry into the incumbent's market are lowered or even demolished, and efficient market exit is facilitated. The forceful encouragement of competition by the process of market contestability, enabling poor performers to be replaced by better performers, should improve overall system performance. Business service consumers could exercise real options about how to choose among publicly and privately provided services.

The need for genuine market for business services is nowadays evoked by the most active players in local clusters For one thing, the Agency's participatory model, in which interest groups are involved in making decisions collectively about business services, does not seem to be promptly attuned to the current demands expressed by individual companies because each and every company ought to be embarked in a long process of convincing all other participants that its requirement is the correct one. For another, an increasing number of business leaders, enterprises of all sizes and industry-wide associations have reached the conclusion that the Agency model is not able to face sea changes (highlighted in Table 3.5), which are contributing to widen the local cluster's boundaries from a self-contained territory to a strong international dimension. From their achievements in export markets, local clusters have got much benefit in terms of experience and business relations so as to forge even closer international links over time. These systems have increasingly led to a wider and deeper internationalisation process through international industrial co-opera-

tion, international outsourcing, technology transfer, foreign direct investments, and so on.

Table 3.5

Major changes in local clusters

• A broader environment in which firms must operate.
• Increased interactions with large corporations outside the local cluster.
• International delocalisation of manufacturing and services for a better performance in terms of cost effectiveness and market competitiveness.
• Diversification around the firm's cores competencies.
• New forms of organising economic activities (e.g., firms' networks and network-firms), which, in turn, create links beyond the local cluster.
• New key community players and partners, such as universities, research institutions, knowledge-based start-ups, and entrepreneurial growth companies which bring forth an international vision of territorial development.

In the new competitive context, asymmetric shocks spring from the Agency's policy. Should the Agency's intervention be addressed to shelter the rearguard of the cluster's business army from the outer rivals' fire, this would have a chilling effect on territorial innovation. On the contrary, if the Agency were experimenting with policies in favour of the most advanced part of the

Which firms should be left out of the Agency's intervention? There is a trade-off between the solidarity principle, which implies the inclusion of as many firms as possible, and innovation, which suggests making a choice in a targeted fashion close to the notion of selecting potential winners.

business league[34], this would jeopardise the most sensitive ingredient in the cluster economy — which is social cohesion. In theory, the Agency's policy could be designed to suit 'average' conditions. In practice, actions that try to reconcile rearguard and vanguard, solidarity and innovation, often stir up a clash of interests that paralyse the Agency's life.

If the Agency model is no longer viable, which alternative organisational forms can tackle changing needs in changing markets? "Free agents" provide the ideal form of industrial self-government in the cluster economy. If the agency is a state-biased consultant, free agents are business-sensitive doers who negotiate a performance contract basis bypassing government processes led by the agency. Self-interest would lead to great mobility between free agents and the disclosure of the secrets of one to another. They are 'free':

- From the influence of government patronage and restriction of competition.
- To promote greater community participation.
- From acting out a part that someone else like the Agency has not written for them.
- To respond to the moves made by other players instead of being forced to respond to those made by the Agency: in other words, willing to play with "seductive" rather

[34] For example, this is the tendency observed by Farell and Lauridsen (2001: 14) in the case of the Emilia-Romagna region: "...officials within the regional government and ERVET believe that it is exactly the leader firms who have the potential to participate in international networks. This marks a fundamental shift in the Emilian model of provision of *real services* — the emphasis is now on helping leader firms to survive in international markets, and on helping medium sized firms to grow and adapt to a leadership role, rather than on supporting the network of small firms as such".

than with "forcing" moves[35].

- To design a "motivation-to-buy" strategy[36] in order to nurture innovation in the marketplace rather than grappling with the Agency's strategy based on bureaucratic modalities and hence on the lubrication of the budget-allocation channels. Private service providers thus realise that innovation is a business around the logic of the situation ordained by market conditions. By implication, they move where and when opportunity knocks, proceeding in a non-linear progression in which marketing tools can be used "before there is any research" (Drucker, 1973: 801). Conversely, the Agency organises innovation as a function carried out by a preconceived time sequence (i.e., the traditional one in which research comes first and marketing is put into play at the very end), under the guidance of a decision pattern drawn up by its government, EU Commission and universities constituencies. This approach often embodies a disregard for market signals.

---

[35] "A *forcing move* is based on the fact that other players have to respond to the move made by one player, and that there is only one possible response to the move. A *seductive move* is based on the fact that other players do not have to respond to it, but they want to, because it takes into account other players' strategies and goals" (Sotarauta, 2001).

[36] The assumption beneath this strategy is that innovation occurs mainly in the market and the process is driven by the customers. As Peter Drucker put it, "Innovation is not science or technology, but value... To start out with the consumer's or client's need for a significant change is often the most direct way to define new science, new knowledge, and new technology. Innovation in a business enterprise must therefore always be market-focused" (Drucker, 1973: 788).

- To be resilient. When hit by change, they are remarkable at adapting — in contrast with the Agency that stagnates or recoils, being reined in by its bureaucratic attitude.
- To think up effective new ideas and enact the policies once they have been agreed.
- To assemble imagination, knowledge, talent and capital necessary to channel their efforts in the most productive and innovative ways.
- To move where and when opportunity knocks.

The creation and development of a cluster economy is a spontaneous and evolving process that emerges from freedom. Free agents are part of a free-market competition in which failures are a possibile outcome. Economic failures are inherent in that process and play an essential role in the progress of the cluster economy. Failure is like a forest fire burning up space for new growth. Free agents help to get back in the game those who otherwise would persist in their failing ways and, therefore, would become losers. The competitive ideal displays an array of free agents (as those shown in Table 3.6) in a free market, who can take the lead in territorial dynamics.

Free agents in the market make small, localised mistakes. The planning bureaucracy of the agency makes big, extensive mistakes.

Table 3.6

Examples of free agents

• Agents acting as business intelligence for research and development of new products, marketing, market research and plan, sales, et cetera.
• Agents forging relationships with potential customers in the name of the companies.
• Agents forging relationships with potential customers in their own name, selling the products and buying the technologies directly.

- Agents creating links between producers and distributors — which means establishing contacts with specialised organisations and introducing products and technologies without mentioning names and sources. If a distributor is interested, confidential agreements are made between the agent and the distributor, allowing the latter to contact the producers directly for more information.

The question arises as to why there is not already more competition between Agency and free agents, and what, if anything, government could do to stimulate it. As has been echoed in the case of the packaging machinery cluster in Bologna (see Exhibit 3.3), government ought to be able to improve on the present approach through a broad range of actions: from contestability of the Agency (putting out the implementation of subsidised business services for competitive bids) to promotion of the market discipline, assigning an increasing influence to the private sector.

The agency-model conspiracy falls apart under the pressure of market forces. Policymakers' moves should be afoot that would favour that pressure.

So far, public policy has forced them to connive with the Agency instead of marketing their own services. It is said that many of the Agencies set up with regional funding are facing increased competition from company associations and trade bodies which offer many of the same services and compete for the same subsidies. Yet beneath the surface lies the interest of the two parties to make reciprocal arrangements in order, first, to multiply and, then, share the handouts.

Government has usually been the Agency's most effective ally in keeping competitors out.

Exhibit 3.3

Constraints to the actions of free agents in the case of the packaging machinery cluster in Bologna

"There are several firms in Bologna which are specifically devoted to sales and export of other firms' machinery — these *commercial* firms play a highly important role for many small firms. Typically, such a firm will have a long term relationship with several manufacturers, selling complementary machinery, and will seek to find orders on foreign markets, then negotiating a package deal on behalf of the manufacturers, and receiving a percentage of the sales price as its reward. These sales firms are crucial to the success of smaller firms in the district, yet tend to go unrecognized by national, regional and local government — they do not receive the sorts of export insurance assistance that their German equivalents do. Furthermore, the associational structure of the district is poorly suited to their needs: while they are unable to take advantage of associational assistance provided for manufacturers, the relevant organizations for commercial sector companies also has little relevance for them".

Source: Farrell, Lauridsen, 2001: 9–10.

Innovation can flourish if an increasing number of free agents see greater benefits in competition rather than in collusive practices with the Agency. The removal of restrictions upon the free play of the market, thereby setting into motion a competition policy, is the key to raise free-agents profile from self-employed portfolio professionals[37] to organisations in which the employee's sense of job security lies in his employability

[37] Persons who make their living by doing a variety of kinds of work for different clients (Handy, 2001).

— which means that each and every employee in a free-agent organisation looks to his personal value in the marketplace.

One of the prerequisites to enhance a free-agent culture is a policy shift from what, borrowing from Olson's terminology, one could call a "contrived" market, which is the outcome of certain institutional arrangements about and around the Agency model, to a "self-enforcing" market, which spontaneously emerges from the agent model (Olson, 2000: 174). Whereas the former is based on the principle of tax- and subsidy-maximising, the latter demands tax- and subsidy-cutting. The more a given government spends and the more it taxes in order to finance the Agency, the more is the risk that it crowds out free agents' investment competing for the same money. Either public money goes to the Agency or free agents have to carry a higher tax burden. In a framework of lower taxes and less subsidies, companies would have at their own disposal more resources to allocate for spending increases going into investment and business services. Once the market is free and its reach has been enlarged, then the way is fully open to competitive offers made by free agents. Requesters of services transact with private service providers on a performance basis so that the provision of services truly meets the needs of recipients.

In the alternative scenario the economic process is biased toward the giver of subsidies, that is to say the Agency, to which companies must apply to fill the gap in resources for capital spending and support services. What is more, as recipients of public funds they have to bear the cost of complying with the Agency's regulations and its administration or "delivery", as well as to afford higher transaction costs (i.e., costs of negotiating, monitoring and maintaining relationships with the Agency) in comparison with a regime of low taxes and low subsidies within which free Agents in the marketplace can flourish (Table 3.7). Besides, dealing with the agency is time consuming — which reduces the opportunity to create interac-

tion values through seductive relationships rather than to be tied up in subsidy-empowered relationships.

Table 3.7

Mutually opposed models of supply and demand for business and technology development services

AGENT MODEL	AGENCY MODEL
Supply	**Supply**
Competitive market	Non-market alternatives
Customer knows best	Supplier knows best
Ruled-based system	"Guanxi" or connections-based system
Tax- and subsidy-cutting in a free-market economy	Tax- and subsidy-maximasing in a state-managed economy
Competitive offers	Subsidized offers
Demand	**Demand**
Company A	**Company B**
Turnover 100	Turnover 100
Taxation 30	Taxation 50
Remuneration of factors of production 30	Remuneration of factors of production 30
Available resources 40	Available resources 20
	Additional resources from subsidies through the agency 20
Transaction costs (information and dealing with agents) 10	Transaction and compliance costs (information and dealing with the Agency, consistency of information, timeliness of responses, costs for lobbying and dead weight loss along the way) >10

This brings critics to the conclusion that the Agency model replaces a market-friendly environment with one that is conducive to the formation of a variety of elected and appointed officials, administrators, directors, executives, project managers and co-ordinators, economic planners, government economists, codifiers, mediators, external auditors, advisers and high priced consultants. All these insiders form a class of apparatchiks united in an agreement, basically implied, to act together and pursue a common purpose under a common guide, that of the Agency. This type of mutual awareness in itself constitutes a kind of disguised conspiracy that produces restrictive practises in place of competition. Closely aligned with the subsidy policy, they together secure and control public funds so as to present an organisation far less open and transparent than the Agency should be as a public-driven institution — which explains why transaction costs are a hefty burden. Furthermore, political gamesmanship prevents rather than encourages openness and free-flowing communication. An open policy-making process favouring transparency by the active intervention of free agents is suffocated by the very political nature of the Agency, which is a solo performer employing a patronising tone. Therefore, what prevails is the instinct for keeping closed expertise, that is matters on which only the Agency sees itself as competent to pronounce.

Under these circumstances there are no ways to restrain the government-induced power of the Agency by means of a countervailing power[38] exercised by the Agency's suppliers or customers. In fact, the former are part of the tacit collusion and

[38] The notion of countervailing power has been introduced by J. K. Galbraith as a mechanism alternative to competition in its classical form, which restricts economic power held by a firm. This counterpart of competition appears in the form of new restrains "not on the same side of the market but on the opposite one, not with competitors but with customers and suppliers" (Galbraith, 1957).

most of the latter, as it has been noted earlier[39], are little, private companies which are forced to 'buy' from the Agency.

Builders and enthusiasts of the Agency' compliance machine play down the significance of the anti-Agency criticisms. The counter-argument they have been raising is that the Agency is an instigator of policy innovations, new ideas and initiatives SMEs would not be able to easily conceive and implement alone on the marketplace. Innovation by SMEs entails more than careful free agents: it totally requires an operator that is mindful of the public-good content of its own action when innovative processes and products have to be tailored to the needs of small- and medium-sized companies. Should free agents cover this type of content, those firms could not afford the pertinent costs, especially when the market for risk-capital is lacking — which seems the case, for instance, of the Italian districts (OECD-DATAR, 2001b: 137). Thus, by accenting the notion of "market failure", the Agency's advocates emphasise its peculiar role in sprinkling SMEs with public aid. Besides, the Agency is a vehicle for competition. By applying a principle borrowed from Joan Robinson, the English economist who wrote a seminal book on the "Economics of Imperfect Competition", those who embrace the Agency model draw a picture that shows a (quasi) monopolistic stance of the Agency at one stage (upstream) of the delivering process which fosters competition at other stages (downstream). The Agency's defenders postulate that upstream monopoly in the provision of radical, innovative business practices brings about a downstream polypoly of business-services providers. The Agency makes entry easy to the "manufacturing" stage of the business service industry (Robinson, 1960: 236–237).

That the Agency serves a good purpose can be proved by the observation that for most programmes public funds are con-

[39] See par. 4 in this Chapter.

strained by a 50% contribution to the total amount of spending. Recipient companies have to match the contribution. Even so, the real contribution from the company side is rather below 50%. By deflecting administrative procedures — in some instances, as already mentioned (see par. 4 above), inflating working hours spent on the project co-financed by the agency — companies change into hidden subsidies a relevant part of what ought to be their full contribution. This leads to a serious distortion for non-genuine and non-market costs are big obstacles to arriving at the most efficient solution.

To name a few, there are at least three additional dark sides of the Agency model for which the dissenters' arguments seem more convincing.

First, were the public-good content a relevant argument, public authorities ought to be directly in charge of policies for cluster-based initiatives so as to escape the danger of a variety of abuses ensuing from a vicious cycle in which government officials, agency directors and executives, and ruling interests are involved. Indeed, the Agency's intervention is often used as an excuse by organised special interests for "predation through lobbying that obtains special-interest legislation or regulation" (Olson, 2000: 197) in many forms of protection or support well beyond the provision of public goods. As an alternative, an earmarked tax should be channelled specifically into the Agency for the provision of public goods so as to provide automatic feedback. Voters have to put their money where their mouth is. Nonetheless, such a tax cannot remove all the inherent defects of the political market in which the Agency is embedded.

The argument for the public-good content is at odds with the real course of action taken by the Agency. To some degree a public good exhibits two qualities: indivisibility (i.e., one person's consumption of the good does not reduce the amount available to another) and non-excludability (i.e., a public good

is something the benefits of which no potential consumer can be prevented from enjoying: it is difficult or impossible to exclude individuals from benefiting from the good). Yet the Agency discriminates in favour of specific subjects — those who share the costs of a programme it has adopted. Divisibility and excludability are the outcomes of the Agency intervention. There are still evidence that suggest someone else like a free-rider has taken advantage of the efforts made by those who have helped contribute to the production and costs of a given programme.

Second, to serve their original purpose, public funds that pretend to be sharply focused on innovative projects must be in timing effective and in duration limited. Unfortunately, government programmes have long lead times for payment and implementation. Short of that, the perverse nature of subsidies is such that they show a tendency to be addictive — which implies that "once subsidies are in place, it is very difficult to wean people from their addiction to them" (de Moor and Calamai, 1997: 57). The responsibility for such dependence lies squarely with government officials who have never kicked their habit of bailing out the Agency. This has also a negative effect in the form of less competition in the provision of business and technology development services not least because it makes the Agency more 'visible' than free agents.

Third, the Agency biases the political process towards the recipients of subsidies. Public funds are conveyed in the direction of programmes fuelled by lobbying practises, and cosy relations with government officials can contract into an adverse selection of low-quality proposals. This mechanism induces additional demands for subsidised programmes that otherwise would not exist. A more active Agency also attracts opportunists, who perceive that a new governmental programme can serve as a useful pretext for achieving their own objectives.

8. CONCLUSIONS: MAKING COMPETITIVE FORCES PLAY TO THEIR STRENGTHS

Spontaneous formation of local clusters has induced public authorities to conceive an organisation that should identify and fill gaps in the cluster development process. That is the Agency: a public-private partnership that intends to complement the working of clusters by playing the role of catalyst of collective actions among privately owned, often family-run, small- and medium-sized businesses, predominantly going to look outside their national boundaries for growth. Public-private partnership can help to share costs and may increase the leverage of government funding, first and foremost benefiting small, private companies not accustomed to presenting articulated calls for action to the local policymakers. Through the Agency, they would have a better chance of accessing bigger budgets, more funding, improved training on common issues, and higher levels of functional expertise to draw upon.

Government-backed Agency has become a decisive instrument of political power. Policymakers have put an exclusive emphasis on the Agency as a large-scale institutional arragement for the governance of the cluster economy. By setting policy about how cluster should develop and permitting the Agency to exercise control over it, governments have been enclosing the 'innovation commons".

The Agency's institutional thickness prevents that small-scale market arrangements implemented by free agents interfere in the governance system of the cluster economy.

The Agency's flaws should heighten policymakers' awareness that it is vital to enhance market solutions by free agents. Yet, the Agency as a large-scale institutional arrangement for the cluster governance is likely to remain a central part of the political armoury.

Albeit the time is ripe for actions that should force deregulation of the Agency's realm, policymakers are not in determi-

nation to break down a monolithic, Agency-based system of governance. This, which is entrenched in their thinking, cannot be dislodged: "I have made up my mind. Do not try to confuse me with alternative policy views and facts that challenge the Agency's internal (governance structure) and external (value added to the cluster) effectiveness". Instead of regarding the Agency's role as unseemly, they prefer to continue with a power-sharing arrangement between officials and Agency executives.

A picture after the manner of Joan Robinson evokes the apologists of the Agency model and the government planners as those who figure they have found the *magica formula* that benefit clusters with almost endless good times (Robinson, 1970: 86). Whichever way one looks at the Agency, what we have to keep asking ourselves is if the Agency is a triumph of hope over experience, of experience over hope, of arrogance over experience. To find an appropriate answer to this question, there is a need for clarity about the capital and organisational structure, the relationship between the public function (if any) and the economic performance, and the external accountability of the Agency. Attempts to check up with observations of both internal results (i.e., what actually happens inside the Agency in terms of administrative efficiency) and external ones (i.e., who are the end beneficiaries) are adulterated by being those results linked to institutional support — which is like saying 'political endorsement'. Thus, differences of opinions and ideological bias are impossible to exclude. This explains why so far only the surface of the Agency problem has been barely scratched.

> *Even when there are attempts to create measurable goals for the [Agency], the [Agency] may attempt to shift these in its own favour.*
>
> *(Peters, 2001)*

The Agency's fortune has been primarily dependent upon the largesse of central and local authorities whose willingness to

experiment with policies for territorial development looks stubborn. In this respect, the Agency looks like the sorcerer's apprentice of public bids (mostly made up by the eurocracy in Brussels) round which elected and appointed officials have been competing to reward their favoured causes. Keenest attention should therefore be paid to the manner in which the Agency has been governed — basically, at the root of the Agency, lack of transparency, accountability and openness.

A mounting tide of criticism is going to change the Agency's portrait from the image of a fairy godmother that enhances economic performance into that of a corporatist witch that harms the cluster economy. Today's dissident voices within the cluster economy are individual entrepreneurs as well as community players: a number of organised business groups — once the Agency's active cohorts and nowadays its sleeping partners in retreat. Doubts have begun to creep in even among some who used to be solid advocates of governmental activities through the Agency. Yet they hesitate to do a complete about-face.

Opponents of the Agency model charge that public largesse squanders resources and so it encourages unsustainable practices. The monopolistic stance of the Agency deflects its managers from attempts to increase their efficiency or to reveal the Agency's true costs of production for the services provided. Moreover, a 'regulatory juggernaut' by an 'administrative dictatorship' stifles the Agency's process of providing cost-effectively services. The bottom line of these concerns is simple: Companies and organisations receiving the Agency's support have to bear heavy costs of over-regulation. Rather than those who manage things, they

The Agency is an incumbent that crowds out private sector decision-making and maintains its position whether out of its control of information concerning the public-policy making or through the practise of cross-subsidies from areas where it retains a 'legal' monopoly.

must employ people who count them. In principle, entrepreneurs want a clear-cut "business-like" relationship with the Agency as well as an explicit time limit placed on Agency decisions. In practice, as most of them put it, working with the Agency is like navigating through red tape, with slow and non transparent decision making. Especially in regard to micro and small enterprises to which the Agency claims to give the greatest care, it sounds as if only counterproductive results ought to emerge from getting involved in the Agency's spiral of subsidies.

Subsidies-led increased interface between public officials, Agency's employees and private business make the agency the site where government does deals, which lead to suspicions of wrong doing.

Regulation, on its own, impedes rather than promotes competition. The Agency is transformed into a machine for political patronage, interface in business and even corruption. For one thing, a small group of Agency directors and executives can exert enormous influence over elected and appointed officials in getting the rules changed to their benefit. For another, politicians can split authority between different Agencies, and take advantage of their rivalry. All the while lobbyists clustering round the pork barrel are seen as hi-jacking the Agency's agenda. The logical conclusion is that the Agency's bureaucracy, seeking to expand its own power in competition with other Agencies for increased funds, attempts to limit rivalry to areas outside its core activity and, at the same time, induce policymakers to produce new policy initiatives for new programmes that the Agency itself will accomplish. This is one of the reasons why there is substantial disagreement among analysts of bureaucracy as to both the

Interagency rivalries, special interests and entrenched bureaucracy frequently hinder the agency's efforts.

nature and efficacy of this kind of competition among Agencies (Peters, 2002).

The Agency makes access to information inefficient and cumbersome. The market demands a greater disclosure about public bids.

Concessions to the competitive ideal call for a change in mood whose repercussions would precipitate the ultimate fall of the cluster-based Agency model. The problem of role recognition continues to bedevil free agents who have seen themselves as the victims of unfair competition by the Agency. Governments must remove much of the information and brokerage function of the Agency, and remove would spell the end of long-term implicit contracts with the government. Thus, free agents could have access to information that is clear, objective, comprehensive, relevant, and easy to find. Because of an information gap (i.e., the Agency knows more about public bids), poor quality projects have been pushing good ones out of the market. Stricter procedures and criteria for submitting bids and selecting winners should be perfected so as to reach a higher level of transparency. Governments should also provide sufficient time and flexibility to allow for the emergence of new ideas and proposals by free agents. The result would be more dynamism in the cluster economy.

In the cluster economy it is a crucial turning point the passage from what von Hayek (2002: 37) called "*central* direction and organisation of all our activities according to some consciously constructed *blueprint*", which led to the creation of bureaucratic Agencies, to the development of alternative policies centred on business self-discipline in a competitive climate moderated by public authorities. Elected and

Subsidy-based policy politicise the cluster economy. Market-based policies conceive programmes that are faced with competition between different business service providers, and therefore offer companies alternative choices.

appointed officials should play the role of facilitators or referees that enforce the competition game between free agents, rather than that of players wearing the Agency's colours. According to this view, policymakers are seen primarily as creating a level playing-field, whereas it is deemed inappropriate for them to give preferential treatment to any Agency.

It is a vital move to replace the dominant value of governmental programmes centralised in the Agency's hands with that of their decentralisation in the marketplace.

In consequence, their attitude should shift from actively enforcing policy mediated by the implementer-Agency to operating a 'hands-off' approach to business services, directly facilitating private sector agents that deliver those services. The private sector wants to see public authorities facilitating its life, not managing it. All levels of government ought therefore to get rid of all the Agency's activities the private sector could run perfectly well and usually better. On the whole, a bigger role must be conferred to market discipline.

Agencies have fallen into a bureaucratic trap because their promises far exceed their ability to perform. There are several key reasons for this performance gap.

First, government backing makes the Agency risk-free. Because there is no threat of bankruptcy, the Agency lacks the incentives to seek grater efficiency and effectiveness.

Second, the Agency should award appointments and contracts on merit rather than for political preferences. Nevertheless, they fail to attract high quality, professional management from outside the 'family' of politicians and, therefore, without political patronage and *parentela* relationships as likely to come from political affiliation as from consanguinity. Independent, businesslike directors and experts are excluded from the 'inner circle' because merit selection for policy-making positions unlike political recruitment implies that the Agency's pro-

grammes will be selected by business competence criteria, whereas political appointees make a selection according to their political predisposition. Meritocracy is overwhelmed by a spoils system of an introverted oligarchy whose rule of conduct is that of withholding from the Agency enough autonomy from doing its job in a more business-like manner, otherwise this would imperil closer ties with the government (Peters, 2001: 87).

Third, should business managers replacing bureaucrats should retain control of the Agency, a better control of the Agency's costs would result. But a greater efficiency does not mean that the Agency is doing the right things. As Peter Drucker has admirably elucidated, the lack of effectiveness is intrinsic to the very nature of a government agency. The essential argument Drucker makes is that inasmuch as the Agency is "paid out a budget allocation" rather than "for satisfying the customer" the result is that budget-based institutions see larger budgets rather than greater achievements as the measure of performance. "Results — Drucker observes — in the budget-based institution mean a larger budget. Performance is the ability to maintain or to increase one's budget". This implies that the same business managers must become politicized bureaucrats themselves so that they can be successful in the process of "buying in" — to wit, "getting approval for a new programme or project". Partisan politicking is much more highly valued than performance.

The Agency's major goal is the expansion of its budget directed at internal maintenance, so that the continuation of its existence can be assured.

The foregoing argument is not straightforward for those who argue that the Agency is a budget-based institution solely in its early stage of development. Later when the Agency's main revenue stream comes from customers, the Agency must sat-

isfy its clients to win larger budgets. This criticism looses its weight once the origin of that revenue stream is unveiled. Generally customers only seem to pay as the key resource transfers for the Agency remain from public resources. The Agency is valued in terms of how much support it receives from elected and appointed officials far more than for services rendered. So we come back to the budget allocation thesis raised by Drucker (Drucker, 1973: 142).

Fourth, reliance on subsidies makes the agency less demanding in terms of project selection. What stands out is a broader idea of 'preferences' that easily encompass good as well as bad projects. To obtain its budget, the Agency must satisfy the demands of different constituencies rather than maximising outcome. Citing again Drucker, "it must placate everyone", and if this means that the Agency cannot "abandon the wrong things, the old, the obsolete", then the lack of results is a good excuse for "redoubling efforts" and hence for getting much help (i.e., additional resources) from government (Drucker, 1973: 145).

Subsidies allow the Agency to be less demanding of their clients than free agents in the market must be.

Finally, public authorities try their hardest to avoid responsibility for the Agency's failures. In reality, with subsidies pumped into the Agency, taxpayers are those who assume the risk for projects.

It is time to question received wisdom. The ultimate task of public policy for clustering ought to be of the quantum-physics type. Rather than managing matter called cluster from the outside — lifting it from the gravity of selfishness, moving it against frictions caused by lack of trust and spontaneous sociability, melting or burning it to change its form — public policy should intervene to manipulate matter from inside the 'atomic' and 'molecular' structure of the Agency model forged by poli-

cymakers. In that microcosm, "there is plenty of room at the bottom"[40] that allows legislators to change the current course of policy making. Oddly, it is easier said than done. So, the shape of things to come is not already apparent.

Such moves, which would turn on its head the 50 or so year-old intervention policy icon, risk being neutralised. Market competition continues to be hindered by top-down controls exercised by government and its favouritism paid to the Agency. Policymakers and the bureaucracy around them hold an Agency ideology that simply states that either the Agency and its existing programmes must be preserved or, if there is a need for changing policies, a new set of policy priorities must be imposed by them and the subsumed programmes must be implemented by the Agency.

Even amid the torrent of criticism, there are no encouraging signals that policymakers want to initiate a comprehensive review of policy, reversing the tendency in favour of the Agency model for the time being. Indeed, they want to avoid tackling real problems head-on. At best, re-engineering the Agency applying to it the management principles of the private sector, seems the 'great' idea around. Doing so, policymakers want to avoid answering the question if there is still a mission and of what type for an organisation in growing disarray. At worst, they drag their feet on Agency structural reform in the face of interested groups opposition. All in all, government policy for cluster and clustering is far from having

> *There are a number of rather amusing examples of Agencies that have long outlived their stated purposes and have become essentially sinecures for the remaining employees.*
>
> *(Peters, 2001)*

[40] As the Nobel Prize Winner Richard Feynman proclaimed in a famous speech at Caltech in 1959.

travelled the full distance from a political market to a competitive liberalised market.

Consensus-building, mostly influenced by special-interest politics, is largely responsible for a feat not yet achieved, that dreamed of by the Irish philosopher Hugh Forde[41] who has conceived "a regional economy built on collaboration, led by industry clusters where there are no boundaries between members or across memberships, where the partnerships that exist within and across clusters extends to include all customers and suppliers. There is perspicacity, resolve and commitment to articulate the inherent challenges of a transparent and seamless environment where the need for social and political change as well as organisational, technological and cultural change is accepted and satisfied. In the absence of boundaries in this Dreamworld, there are only people and relationships. The exchange of people and skills and the diffusion of explicit knowledge and technology, across clusters and with externals in the form of alliances, partnerships, and grouping of competencies are empowering the cluster community to improve, solve problems, benchmark, listen, talk, think, imagine, create and innovate. Apathy, gatekeepers, complacency, arrogance, bureaucracy, and poor quality are annihilated"[42].

A dreamworld-type of cluster evokes a high quality of leadership. Further research is required to explore the role of leadership in the different stages of cluster formation and development. Historically, visionary industry

There is a profound cultural clash between the genuine entrepreneurial nature of the cluster community and the bureaucratic management of the Agency's apparatus.

---

[41] hugh.forde@sabv2010.com.au

[42] Quoted from The Clustering Alliance, December 2001, No 24, a newsletter of Clusters Asia Pacific Inc., apd@orac.net.au

heroes have incubated clusters, and from the embryo stage to the full developed their followers as industry leaders have played a very constructive role. The government's part has been first to identify clusters Their successors have played a very constructive role from the development stage to the full expansion. The government's part has been first to identify clusters and then reinforce them. But, in doing this, political factors, often disguised as institutional ones, have intervened to change the leadership in favour of the Agency's introverted oligarchy, which, overwhelming the business supremacy, has been retreating into its shell instead of being a locomotive of the cluster economy.

REFERENCES

1. **Amidon, D.**, The Innovation SuperHighway. Entovation International News, 2001, No 49.
2. **Amidon, D.**, The Innovation SuperHighway. Butterworth-Heinemann, 2002.
3. **Arthur, W. B.**, Competing Technologies, Increasing Returns and Lock-in by Historical Events. The Economic Journal, 1989, Vol. 99, No 394.
4. Australian National Audit Office. Principles and Better Practices: Corporate Governance in Commonwealth Authorities and Companies. Canberra: Australian National Audit Office, 1999.
5. **Bailey, R.**, The Law of Increasing Returns. The Cato Institute, 2000, March 18.
6. **Bellini, N., Giordani M. G., Pasquini, F.**, The industrial policy of Emilia Romagna: the business service centres. In: Robert L., R., Nanetti, R. Y., (ed.), The Regions and European Integration. The case of Emilia-Romagna, London, New York: Pinter Publishers, 1990.
7. **Bellini, E., Zollo, G.**, Technology-based Entrepreneurship: Academic Spin-offs in Less Developed Areas. In: Formica, P., Mitra, J. (eds.) Innovation and Economic Development: University-Enterprise Partnership in Action, Dublin-London: Oak Tree Press, 1997.
8. **Brockman, J.**, Digerati. Encounters with the cyber elite, Orion Business Books, 1997.
9. **Buchanan, J. M.**, An Economic Theory of Clubs. Economica, 1965, No 3.
10. **Carbonara, N., Mitra, J.**, New Actors For The Competitiveness of Local Clusters and Industrial Districts: A cognitive approach. Paper submitted to the 46th International Council

for Small Business World Conference, Taipei, 17–20. June, 2001.

11. **Casas-Pardo, J., Puchades-Navarro, M. A., Sajardo-Moreno, A.**, Volunteer NonProfits' Provision of Collective Goods as a Public Choice Decision. IUDEM working paper, 2001.
12. **Cauley de la Sierra, M.**, Managing Global Alliances: Key Steps for Successful Collaboration. Addison-Wesley Publishing Company, 1995.
13. **Chatman, J. A., Polzer, J. T, Barsade, S, G., Neale, M. A.**, Being Different Yet Felling Similar: The Influence of Demographic Composition and Organizational Culture on Work Processes and Outcomes. Administrative Science Quarterly, No 4, December 1998.
14. **Christensen, C.**, Innovator's Dilemma. Harvard Business School Press, 1997.
15. **Clara, M.**, Real Service Centres in Italian Industrial Districts. Lessons Learned from a Comparative Analysis. UNIDO/Italy Programme for SME Development, 1999, mimeo.
16. **Coase, R. H.**, Firm, the Market and the Law. Chicago: University of Chicago Press, 1990.
17. **Coleman, J. S.**, Foundations of Social Theory. Cambridge MA: Belknap Press of Harvard University Press, 1990.
18. **Collins, J.**, Turning Goals into Results: The Power of Catalytic Mechanisms. Harvard Business Review, July–August, 1999.
19. **Cooley, M.**, Architect or Bee? The human Price of Technology, The Hogarth Press, 1987.
20. **Coyne W. E.**, Building a Tradition of Innovation. The 5th UK Innovation Lecture, London: Department of Trade and Industry, 5 March 1996.
21. **De Moor, A., Calamai, P.**, Subsidizing Unsunstainable Development: Undermining the earth with public funds. The Earth Council and the Institute for Research on Public Expenditure,
(www.ecouncil.ac.cr/rio/focus/report/english/subsidies/htm), 1997.

22. **DeMuth, C.**, Is the Clean Air Act Unconstitutional? AEI-Brookings Joint Center for Regulatory Studies, October 4, 1999.
23. **Devan, J., Tewari, P. S.**, Brains Abroad. The McKinsey Quarterly, No 4, 2001.
24. **Donkin R.,** Learning curves for companies. Financial Times, 2 August 1999.
25. **Downes, L., Mui, C.**, Unleashing the Killer App — Digital Strategies for Market Dominance. Harvard Business School Press, Boston, Massachusetts, 1998.
26. **Drucker, P.**, The Practice of Management. New York: Harper & Row, 1954.
27. **Drucker, P.**, The Age of Discontinuity. New York: Harper & Row, 1969.
28. **Drucker, P.**, Management: Tasks, Responsabilities, Practices. New York: Harper Business, 1973.
29. **Drucker, P.**, The New Society of Organisations. Harvard: Harvard Business Review, September–October, 1992.
30. **Drucker, P.**, Post-Capitalist Society, New York: Harper Business, 1993.
31. **Drucker, P.**, Management Challenges for the 21st Century. New York: Harper Business, 1999.
32. **Edvinsson, L.**, Corporate Longitude. Navigating the Knowledge Economy, Financial Times Prentice Hall, 2002.
33. **Enright, M. J.**, Regional Clusters: What we know and what we should know. Paper prepared for the Kiel Institute International Workshop on "Innovation Clusters and Interregional Competition", School of Business, The University of Hong Kong, Kiel 12–13 November, 2001, mimeo.
34. **Etzkowitz, H.**, From knowledge flows to the triple helix. Industry & Higher Education, December, 1996.
35. **Farrell, H., Lauridsen, A. L.**, Collective Goods in the Local Economy. The Packaging Machinery Cluster in Bologna, mimeo (also in: Crouch, C., LeGalés, P., Trigilia, C., Voelzkow, H. (eds.), Local Production Systems in Europe, Oxford: Oxford University Press, Vol. II, 2001.
36. **Feynman, R. P.**, The Pleasure of Finding Things Out. The best short works of Feynman, R. P., London: Penguin Books, 1999.

37. **Flake, G. W.,** The Computational Beauty of Nature: Computer Explorations of Fractals, Chaos, Comples Systems, and Adaptation, Cambridge (MA) and London: The MIT Press, 1999.
38. **Formica, P.**, Frontiers of Business Collaboration. The Case of the Packaging Machinery Cluster in Bologna Region, mimeo (a previous version with the title "A Voyage to Innoland" has been published in: Formica, P., Taylor, D. (eds.), Delivering Innovation: Key Lessons from the World-Wide Network of Science and Technology Parks, Digital Malaga: IASP Publication, 1998), 2001.
39. **Formica, P., Mitra, J., Nicolò, V.**, The Role of Networking Environments in Supporting SME Competitiveness: The Case of the London Technopole Initiative. Conference Proceedings Small and Medium Sized Enterprises in a Learning Society, University of North London, 20–21 June 1996.
40. **Formica, P., Facchini, C., Pezzi, A.**, Creation of a Network Enterprise and Networking of Enterprises through the Programmed Spin-Off: the Faenza Model. Paper presented at the International Conference on "Networking and Small and Medium Sized Companies", Bologna: University of Bologna, University of North London, 19–20 June 1997.
41. **Fukuyama, F.**, Trust: The Social Virtues and the Creation of Prosperity. The Free Press, 1995.
42. **Fuller, S.**, 'Social Capital': What's in a Name. New Academy Review, Vol. 1, No 3, 2002.
43. **Gadiesh, O., Gilbert J.**, Profit Pools: A Fresh Look at Strategy. Harvard Business Review, May–June, 1998.
44. **Galbraith, J. K.**, American Capitalis. London: Hamish Hamilton, 1957.
45. **Ghoshal, S., Bartlett, C. A.**, The Individualized Corporation. London: Heinemann, 1998.
46. **Gibb, A.**, Creating conducive environments for learning and entrepreneurship. Industry & Higher Education, Vol. 16, No 3, June 2002.
47. **Gilder, G.**, Moore's Quantum Leap. Wired, January 2002.
48. **Gladwell, M.**, The Tipping Point. How Little Things Can Make a Big Difference. Boston-New York-London: Little, Brown and Company, 2000.

49. **Guillén, M. F.**, Corporate Governance and Globalization: Is There Convergence Across Countries? The Wharton School and Department of Sociology, University of Pennsylvania, 2000.
50. **Hague, D.**, Beyond Universities: A New Republic of Intellect. London: Hobart Paper, 1991.
51. **Hall, P. A., Soskice, D.** (eds.), Varieties of Capitalism: the Institutional Foundations of Corporate Advantage. Oxford University Press, 2001.
52. **Hampden-Turner, C., Trompenaars, F.**, Mastering the Infinite Game. How East Asian Values are Transfroming Business Practices, Oxford: Capstone, 1997.
53. **Handy, C.**, Gods of Management: The changing world of organisations. Arrow Books, 1995.
54. **Handy, C.**, The Elephant and the Flea: Looking Backwards to the Future. Hutchinson, 2001.
55. **Hawley, E. W.**, The NEW DEAL and the Problem of Monopoly: A Study in Economic Ambivalence. New Jersey: Princeton University Press, 1966.
56. **Hayek, F. A.**, The Road to Serfdom, Chicago: University of Chicago Press, 1944.
57. **Henderson, D.**, Anti-liberalism 2000. London: The Institute of Economic Affairs, [www.iea.org.uk], 2001.
58. **Henig, P. D.**, Revenge of the Bricks. Red Herring Magazine, 1 August 2000.
59. **Hirschman, A. O.**, The Strategy of Economic Development. New Haven: Yale University Press, 1958.
60. **Horibe, F.**, KM and Innovation: Can They Thrive Together?, KM Review, Vol. 5 Issue 2, May–June 2002.
61. **Howard, W. G., Guile B. R.**, Profiting from Innovation. New York: The Free Press, 1992.
62. **Hunt, J.**, The value of conflict. Financial Times, 16 December 1998.
63. **Idei, N.**, The Law of Increasing Returns. Interview released to Dan Gillmor, Political leaders also Need to Change, Future Company, 13 October 2000.
64. IASP-International Association of Science Parks. European Survey, Science & Technology Parks: the tenants' point of view, Malaga, 20 June 1998, mimeo.

65. **Jackson, T.**, Melding of minds to master the intangibles. Financial Times, 15 June 1998.
66. **Jarillo, J. C.**, Strategic Networks: Creating the Borderless Organization. Oxford: Butterworth-Heinemann, 1993.
67. **Jeffry, T.**, America's Entrepreneurial Revolution: The Demise of Brontosaurus Capitalism. Wellesley: Babson College, 1999.
68. **Joseph, E., Parkinson, J.**, Confronting the Critics. New Academy Review, 2002, No 1.
69. **Kaplan, S., Sawhney, M.**, B2B E-Commerce Hubs: Towards Taxonomy of Business Models. Harvard Business Review, May 2000.
70. **Kauffman, S.**, At Home in the Universe: The Search for Laws of Self-Organization and Complexity. Oxford University Press, 1995.
71. **Kay, J.**, Foundations of Corporate Success. Oxford University Press, 1995.
72. **Kay, J.**, The oblique approach. Financial Times, 28 October 1998 a.
73. **Kay, J.**, A scientific formula for playing games in the dark. Financial Times, 30 September 1998 b.
74. **Kelly, K.**, Out of Control: The New Biology of Machines. Addison Wesley Inc., 1994.
75. **Kelly, J.**, Intellectual Property and All the Jazz: Intellectual Property & Science Parks. In: Formica, P., Taylor, D. (eds.), Delivering Innovation: Key Lessons from the World-Wide Network of Science and Technology Parks, IASP, Digital Malaga, 1998.
76. **Kindleberger, C. P.**, International Economics. Richard D. Irwin, Inc., 1963.
77. **Klein, K.**, The Economics of Ideas (interview to Paul Romer). Wired, June, 1996.
78. **Koremenos, B., Lynn, L. E., Jr.**, Leadership of A State Agency: An Analysis Using Game Theory. The University of Chicago — The Irving B. Harris Graduate School of Public Policy Studies, Working Paper Series: 94.3, 2001.
79. **Kodama, F.**, Technology Fusion and the New R&D. Harvard Business Review, 1992, No 4.
80. **Kosko, B.**, Fuzzy Thinking. HarperCollins Publishers, 1994.

81. **Landry, J.**, Chemical suppliers aim to balance B2B scales. Redherring.com, 11 May 2000.
82. **Leonard, D. A.**, Mining Knowledge Assets for Innovation. Knowledge Management, 1998, Vol. 1, Issue 1.
83. **Liebowitz, S.**, Re-Thinking the Network Economy. AMACOM, 2002.
84. **Liikanen, E.**, The 2001 Innovation Scoreboard. Enterprise Directorate General, European Commission, Brussels, 2001.
85. **Manimala, M.**, Managing R&D in SMEs: Taking advantage of the giants' shoulders. Industry & Higher Education, June 2002, Vol. 16, No 3.
86. **Marino, A. M., Matsusaka, J. G.**, Decision Process. Agency Problems and Information: An Economic Analysis of Budget Procedures, University of Southern California, Department of Finance and Business Economics, Working Paper No. 01–05 August 2001, [http://www.marshall.usc.edu/web/FBE.cfm?doc_id=1491].
87. **Martin, R., Sunley, P.**, Deconstructing Clusters: Chaotic Concept or Policy Panacea? Paper presented at the High Technology Small Firms One-Day Clusters Conference, Manchester Business School, 18 April 2002.
88. **Means, G., Schneider, D.**, MetaCapitalism: The e-Business Revolution and the Design of 21st Century Companies and Markets. New York: John Waley & Sons, 2000.
89. **Micklethwait, J., Wooldridge, A.**, The Witch Doctors: What the Management Gurus are Saying. Why It Matters and How to Make Sense of It, Mandarin, 1997.
90. **Miles, R. E., Snow, C. C.**, Causes of Failure in Network Organizations. Califormia Management Review, Summer, 1992.
91. **Milton-Smith, J.**, Notes from the International Forum of Entrepreneurship. Enterprise Research and Development Centre, Business School, University of Central England, Birmingham, 2000.
92. **Milton-Smith, J.**, In Search of Silicon Asia: Strategies for Developing Technopreneurs in the Asia-Pacific Region. In: Formica, P., Sanz, L. (eds.), Frontiers of Entrepreneurship and Innovation: Readings in Science Park Policies and Practices, IASP, Malaga, 2002.

93. **Minniti, M.**, Global Entrepreneurship Monitor — National Entrepreneurship Assessment. Executive Report, Babson College, 1999.
94. **Mitra, J., Formica, P.** (eds.), Innovation and Economic Development: University-Enterprise Partnerships in Action. Dublin-London: Oak Tree Press, 1997.
95. **Mitra, J., Matlay, H.**, Entrepreneurship and learning — A Stakeholder Model of Entrepreneurship and Regional Development. Paper delivered at the 18th Annual International Conference association of Management and International Association of Management, San Antonio, Texas, 10–12 August 2000.
96. **Moore, J. F.**, Predators and Pray. A New Ecology of Competition. Harvard Business Review, 1993, No 3.
97. **Moore, G. A.**, Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers (revised edition). A Harper Business Book, 1999.
98. **Morita, A.**, 'S' does not equal 'T' and 'T' does not equal 'I'. The First United Kingdom Innovation Lecture, London: Royal Society, 6 February 1992, mimeo.
99. **Moritani, M.**, Japanes Technology. Tokyo: Simul Press, 1982.
100. **Nairn, G.**, Winds of change sweep through the marketplace. Connectis, July 2000, Issue 4.
101. **Nalebuff, B. J., Branderburger, A. M.**, Co-opetition. London: Harper Collins Business, 1996.
102. National Commission on Entrepreneurship. Building Entrepreneurial Networks, Washington, December 2001a.
103. National Commission on Entrepreneurship. Five Myths about Entrepreneurs: Understanding How Businesses Start and Grow, Washington, March 2001b.
104. National Commission on Entrepreneurship. Community Colleges and Entrepreneurship Education: Expanding the Circle, biweekly report, 15 October 2002a, No 61.
105. National Commission on Entrepreneruship. Angels to the Rescue? Biweekly report, October 29 2002b, No 62.
106. National Commission on Entrepreneurship. The Return of Regional Development Organizations, biweekly report, July 1 2002 c, No 56.

107. National Commission on Entrepreneurship. America Formula for Growth. Federal Policy & the Entrepreneurial Economy, 1958–1998, Washington, October 2002d.
108. **Negroponte, N.**, Being Digital. Alfred A. Knopf Inc., 1995.
109. **Nicolò, V.**, Technology Transfer through Connection with Stimulating Markets. In: Formica, P., Guedes, M. (eds.), The Economics of Science Parks, ANPROTEC, IASP and AURRP, Rio de Janeiro, 1996.
110. **Nonaka, I., Takeuchi, H.**, The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford University Press, 1995.
111. OECD-DATAR, Local Networks of Enterprises in the World Economy: Sixteen Forums. Paris, 23–24 January 2001a.
112. OECD-DATAR, World Congress on Local Clusters — Proceedings. Paris, 23–24 January 2001b.
113. OECD, Highly Skilled Worker Migration Can Boost Economic Growth. OECD Directorate for Science, Technology and Industry, Paris, 2002.
114. **Olson, M.**, Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships. New York: Basic Books, 2000.
115. **Ozawa, I.**, Survival Strategy. Financial Times, 23 July 1999.
116. **Peel, Q.**, A poisoned chalice. Financial Times, 15 July 1999.
117. **Perroux, F.**, Economic Space: Theory and Applications. Quarterly Journal of Economics, February 1950.
118. **Perroux, F.**, Note sur la Notion de Pôle de Croissance. Economie Appliquée, 1955, No 7.
119. **Pescovitz, D.**, The Future of Schools. Wired, June 1996.
120. **Peters, T.**, The Tom Peters Seminar: Crazy Times call for Crazy Organizations. New York: Vintage Books, 1994.
121. **Peters, B. G.**, The Politics of Bureaucracy. Routledge, London-New York, 2001.
122. **Poole, K., Erickcek, G., Iannone, D., McCrea N., Salem, P.**, Evaluating Business Development Incentives. National Association of State Development Agencies, Washington, 1999.
123. **Porter, M. E.** On Competition. Harvard Business School Press, 1998a.

124. **Porter, M. E.** Clusters and the new economics of competition. Harvard Business Review, November-December 1998b, Vol. 76, No. 6.
125. **Porter, M. E.** Location, Competition and Economic Development: Local Clusters in the Global Economy, Economic Development Quarterly, 14, 1. 2000.
126. **Posner, R. A.**, Overcoming Law. Harvard University Press, 1995.
127. **Price, C.**, The Internet Entrepreneurs. Business Rules Are Good: Break Them, FT. com, Pearson Education, London, 2000.
128. **Prince, C., Beaver, G.**, The Rise and Rise of the Corporate University: the emerging corporate learning agenda. International Journal of Management Education, 2001, Vol. 1, No 2, Spring.
129. **Prince, C., Beaver, G.**, Redefining the role of the corporate university: a UK perspective. Industry & Higher Education, August 2002, Vol. 16, No 4.
130. **Reid, I.**, What is Needed to Make Australia a Knowledge-Driven and Learning-Driven Society? Position Paper No 5 prepared for the Business/Higher Education Round Table, Melbourne, June 2002.
131. **Reynolds, P. D., Hay M., Camp, M.**, Global Entrepreneurship Monitor — 1999 Executive Report. Babson College, London Business School and Kauffman Center for Entrepreneurship Leadership, 1999.
132. **Robinson, J.**, 'Imperfect Competition' Revisited — The Causes of Monopoly. In: Collected Economic Papers, Oxford: Basil Blackwell, 1960, Vol. II.
133. **Robinson, J.**, Freedom and Necessity: An Introduction to the Study of Society. George Allen & Unwin Ltd, 1970.
134. **Roddick, A.**, A View from the Chair. New Academy Review, 2002, Vol. 1, No 2, Summer.
135. **Rousseau, J. M.**, Creating Trust to Improve Spatial Development. European Commission, DG regional Polocy, 2002, Unit B3, mimeo.
136. **Sawhney, M., Kaplan, S.**, Let's Get Vertical. Business 2.0, 1 September 1999.

137. **Saxenian, A.**, Regional Advantage: Culture and Competition in Silicon Valley and Route 128. Harvard University Press, 1994, Review, No 3.
138. **Schrange, M.**, Shared Minds: The New Technologies of Collaboration. Random House, 1990.
139. **Seely, B., J., Duguid, P.**, Space for the chattering classes. The Times Higher Education Supplement, 10 May 1996.
140. **Selznick, P.**, TVA and the Grass Roots. New York: Harper, 1966.
141. **Sinatra, A., Borroi, M., Caravati, F., Minoja, M.**, Il Distretto di Carpi: le strategie, le regole del gioco, l'evoluzione e le prospettive nella percezione degli imprenditori. Università Luigi Bocconi-Università di Trento, 1994, mimeo.
142. **Singh, S.**, Fermat's Last Theorem. Fourth Estate, London, 1997.
143. **Smilor, R., Smilor, R. W., Kawasaki, G.**, Daring Visionaries: How Entrepreneurs Build Companies. Inspire Allegiance, and Create Wealth, Adams Media Corporation, 2001.
144. **Smith, V. L.**, Bargaining and Market Behavior. Essays in Experimental Economics, Cambridge: Cambridge University Press, 2000.
145. **Sotarauta, M.**, Buiding Knowledge-based Core Competencies and Leadership in the Flowing World. Research Unit of Urban and Regional Development Studies, Finland: University of Tampere, 2001, mimeo.
146. **Stacey, R. D.**, Strategic Management & Organisational Dynamic. Second Edition, London: Pitman Publishing, 1996.
147. **Stanford, X.**, Social Capital and Innovation Analysis: Case study of the E100 Network: Foundations & Assessment Overview. KnowMap [www.knowmap.com], 2002, Vol. 2, No 2.
148. **Stevens, R. B., Yamey, B. S.**, The Restrictive Practices Court. London: Weidenfeld and Nicolson, 1965.
149. **Stewart, T. A.**, Intellectual Capital, Nicholas Brealey Publishing, 1997.
150. **Storper, M.**, The Resurgence of Regional Economics. Ten Years Later: The Region as a Nexus of Untraded Interdependencies. European Urban and Regional Studies, 1995, No 2.

151. **Sveiby, K. E.**, Knowledge Management and EU. Challenging the Perspective. In: "Seminar on Knowledge Management and the European Union — Results of the Workshops", Utrecht, 12–14 May 1997.
152. **Tapscott, D.**, The Digital Economy: Promise and Peril in the Age of Networked Intelligence. New York: McGraw-Hill, 1995.
153. **Tapscott, D., Lowy, A., Ticoll, D.**, Blueprint to the Digital Economy. Creating Wealth in the era of E-Business, New York: Mc-Graw-Hill, 1998.
154. **Taylor, J., Wacker, W.**, Speak the Future. Wired, June 1997.
155. The Chartered Institute of Management Accountants, Corporate Governance and Control. London, 1998.
156. **Uglow, J.**, The Lunar Men: Five friends Whose Curiosity Changed the World. Faber and Faber 2002.
157. **Uzzi, B.**, Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness. Administrative Science Quarterly, March 1997, No 1.
158. **van der Speck, R., Spijkervet, A.**, Knowledge Management. Dealing Intelligently with Knowledge, Kenniscentrum CIBIT, Utrecht, 1997.
159. **Verespej, M. A.**, Invest In People. They are the only sustainable competitive advantage. [www.industryweek.com], 2 March 1999.
160. Voice of the Entovation 100, Focus on New Products/Services. 2002a, mimeo.
161. Voice of the Entovation 100, Focus on Distributed Networks, 2002b, mimeo.
162. **Wells, J., Barley, K.**, Corporate Universities: Partners in Workforce Education. Paper delivered at the "European Workforce Development Conference", Nottingham: University of Nottingham, 11–13 May 1998.
163. **Wheatley, M. J.**, Leadership and the New Science. San Francisco: Berrett-Koehler Publishers, 1992.
164. **Wheeler, D., Sillanpää, M.**, The Stakeholder Corporation — a blue print for maximazing stakeholder value. London: Pitman Publishing, 1998.

165. **Whitehead, S. P., Wright, G. P.**, About New Ideas. Insight on Creativity from the World's Leading Innovators, Prentice Hall, 2002.
166. **Wills, J.**, 1688: A Global History. London: Granta Books, 2001.
167. **Wood, C. H., Kaufman, A., Merenda, M.**, How ADCO Became a Problem-Solving Supplier. Sloan Management Review, Winter 1996, Vol. 37, No 2.
168. **Wyllie, J.**, Thomas Edison's Business Model. 2002, mimeo.
169. **Yiu, D., Lin, J.**, Sharing tacit knowledge in Asia. KM Review, July-August 2002, Vol. 5, Issue 3,
170. **Zeldin, T.**, An intimate Histroy of Humanity. London: Sinclair-Stevenson, 1994.

In 1890 Alfred Marshall published his "Principles of Economics" in which he included a chapter on "industrial districts", as he defined the geographic concentrations of specialised industries. After the Second World War the term "industrial district" has been applied to the emergence of economic specialisation in specific communities in Italy, mostly in the northeast regions of the country. A century later from Marshall's book, Michael Porter's neo-Marshallian cluster concept has burst on the scene through a series of seminal articles.
The book tracks the evolution of cluster theory from the perspective of the industrial economy to that of the knowledge society, and provides a discursive view of how entrepreneurs, policy makers and governments 'use' clusters today.

Piero Formica *is Dean of the International University of Entrepreneurship at Ijmuiden Amsterdam and Visiting Professor at the University of Tartu, the Men's Higher College of Technology in Abu Dhabi and the Postgraduate School of Business Law University of Bologna.*

TARTU UNIVERSITY PRESS