Preface

This study on benchmarking of the best transfer practices adopted in Europe by the Innovation Relay Centres is a pilot project designed to foster the integration of different economic, managerial and cultural systems.

Innovation is a source of economic development; development enables investment and generates innovation: a perfect example of a virtuous circle. The study focuses attention on the central issue of promoting innovation processes that interface between the world of academia and industry and the economy.

Interaction between research and the economy can no longer be regarded as optional. The future of business increasingly depends on injecting massive doses of knowledge into products, processes and management. Firms will be less vulnerable to international competition the more they concentrate their efforts on design instead of the "simpler" process of production. In a nutshell, this means evolving from "made in Europe" to "designed in Europe".

The ten selected best practices represent an optimum technical and operational route to technology transfer. What we wish to point out here is that the origin and the adoption of these technology transfer benchmarking practices can be traced back to classical concepts of the theory of *complexity management*, concepts that are here summarised in seven separate principles that can be applied to the cases presented in the book.

The principle of self-organisation according to which the elements of a system tend to organise themselves without a specific, centralised plan seems perfectly adapted to the experience of the Innovation Relay Centres. Their practices have been developed and perfected with the aid of actions that were conceived and carried out at the peripheral level.

The second basic principle of the theory of complexity that of "try and learn", which translates in organizational terms into "learning organization" has also been put into practice by the Innovation Relay Centres. The methodologies used are, in fact, the fruit of constant improvement, which has resulted from the great care taken to study the results obtained in the field and fine-tune the proposed processes.

The content of the Relay Centres' action, i.e. the transfer of innovation, can be interpreted according to the third principle of complexity: circular causality. In fact, the transfer is undertaken in order to foster economic development and that, in turn, generates the best conditions for producing further innovation. Innovation and development are simultaneously cause and effect of one another within a virtuous circle that fuels itself within the paradigm of recursive circular causality. To quote Hegel, who described philosophy as the "circle of circles", we could say that the action of the IRCs is directed at the "circle of circles" of economic growth: the development of innovation.

An important key to interpreting the work of the Relay Centres can be found in the fourth principle of the theory of complexity: the management of chaos. Innovation occurs at the dynamic limit between order and chaos, stability and instability, certainty and uncertainty, old and new, predictable and unpredictable, reversible and irreversible, continuity and discontinuity, equilibrium and disequilibria, determinism and chance. Insofar as the Relay Centres promote technology transfer they transfer knowledge, and simultaneously generate innovative transfer methods, navigating, as to both contents and methods, the borderline between order and chaos.

The impossibility of prediction and the workings of chance form the fifth principle of complexity. The activities involved in the transfer of knowledge and innovation to firms and undertakings provide the IRCs with a potential that they can use in their own development strategies. Increasingly, these strategies rely on opportunities that arise, and less and less on plans stemming from predictable technological and market trajectories. The impossibility of prediction and the workings of chance mean that the activity of the IRCs strongly depends on the unpredictable chance result, which the IRCs nevertheless counter with a serious approach in terms of means.

The sixth principle of complexity the hologram principle: the part is in the whole and the whole is in the part uses the classical example of stem cells. The translation of this principle in management terms is the sharing of values, visions, strategies and actions. Ultimately, the actual purpose of this benchmarking study on best transfer practices is to share the best methodologies among all the centres.

The network organization is the realization, in an organizational context, of the seventh principle of complexity: the power of links. By exploiting this enormous power the Relay Centres

can promote themselves as strands in a web designed to capture, share and convey innovation and technologies.

In an increasingly complex social and economic system, this combination of optimum transfer techniques, thus offers a ramified and valid solution to the enormous challenges presented. If Europe aspires to become a place where models at the forefront of development are experimented, it must borrow the typical features of a "learning organization". Authoritative experts maintain that the Regions could be based on the same criteria and elements as knowledge-intensive firms: continuous improvement, production of new ideas, creation of knowledge and organizational learning. The areas in which the IRCs operate adopt the principles of knowledge creation and continuous learning to become "learning Regions" to all effects.

Identifying what needs to be done and how it should be tackled is not an easy matter. Sometimes a little imagination is needed. Albert Einstein believed that "logic takes you from A to B, but imagination takes you everywhere". In other words, the future belongs to those who can imagine it, and the IRCs have indeed proved their ability to do so.

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