5th International Forum on Technology Management

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This special issue of the International Journal of Technology Management presents the whole set of refereed papers which were submitted for the Academic Conference, part of the 5th International Forum on Technology Management, held in Helsinki (Finland) on 7–8 June 1995 and chaired by Professor S. Metcalfe, Dean of the Faculty of Economics, The University, Manchester (UK).[*]

The conference had two main objectives:

- To present papers with up-to-date knowledge which will enable participants to improve their ability to better understand, forecast, assess and eventually control technological change in the future;

- To provide colleagues and doctoral students with a clear vision of research priorities within the area of MOT and subsequently to set up a list of topics in order to prepare the next International Forum on Technology Management due to be held in Amsterdam (The Netherlands) in October 1996.

1   The IJTM Special Issue in perspective

The Academic Conference emphasised three topics that both academia and industrialists consider as crucial within the area of the management of technology (MOT):

1   Managing technology in SMEs;

2   Models and approaches for the management of technology;

3   The learning organisation and the management of technology.

1.1   Managing technology in SMEs

There is a widespread belief that SMEs have a greater than average capacity for technical

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[*] Professors D. Birchall and J.J. Chanaron co-chaired the Scientific Committee and the Organisation Committee of the Academic Conference.

innovation and hence job creation. This has led to initiatives to promote SMEs by government bodies at all levels. The contribution of SMEs to research and innovation has grown consistently and appears to be slightly greater than that of large corporations [1], mainly as a result of shorter development times and closer proximity to the market.

Performance in innovation, however, results from an ability to manage technological core competences [2] through R&D (both internal and external) taking into account factors such as market pressure, suppliers' and customers' input, financial resources, culture and sense of mission. The papers in this section address interesting questions in relation to the management of technology internally within SMEs, how networking between SMEs can aid the process and the difficulty in getting the full benefit of the growth of SME's for the regeneration of the local and national economies.

1.2   Models and approaches for the management of technology

This is clearly an important issue since more than half of the papers submitted by scholars as well as consultants and accepted by the Scientific Committee deal with models, methods and tools. And it is crucial for practitioners to get access to efficient and affordable management techniques.

But when looking at the variety and diversity of papers related to this topic, one got the clear impression that understanding of the processes is still in its infancy. It is then obvious that it urgently needs further in-depth research in order to get more scientifically-based tools and methods for the MOT. Some papers do recognise explicitly this weakness. But the diversity of approaches, i.e. in theoretical background, is still an obstacle to a quite stable textbook for scholars and professionals. One of the main questions remains the understanding of the R&D, Design and Innovation (R&DDI) process as a whole, from idea generation to diffusion models. Tools and methods will vary according to such a vision or approach.

From the papers, one can infer the following theoretical alternatives:

- Some researchers are emphasising behavioural shaping of the innovation process;

- Others give preference to purely organisational and institutional driving forces;

- Others propose a technology-driven approach but with two opposite philosophies, one which deals with a purely sequential and mechanical path of activities and another one which supports a systemic view of networking of social actors;

- Some emphasise a strictly managerial point of view.

The great challenge is indeed how in integrate, or at least to make these four approaches compatible.

The MOT Theoretical Diamond
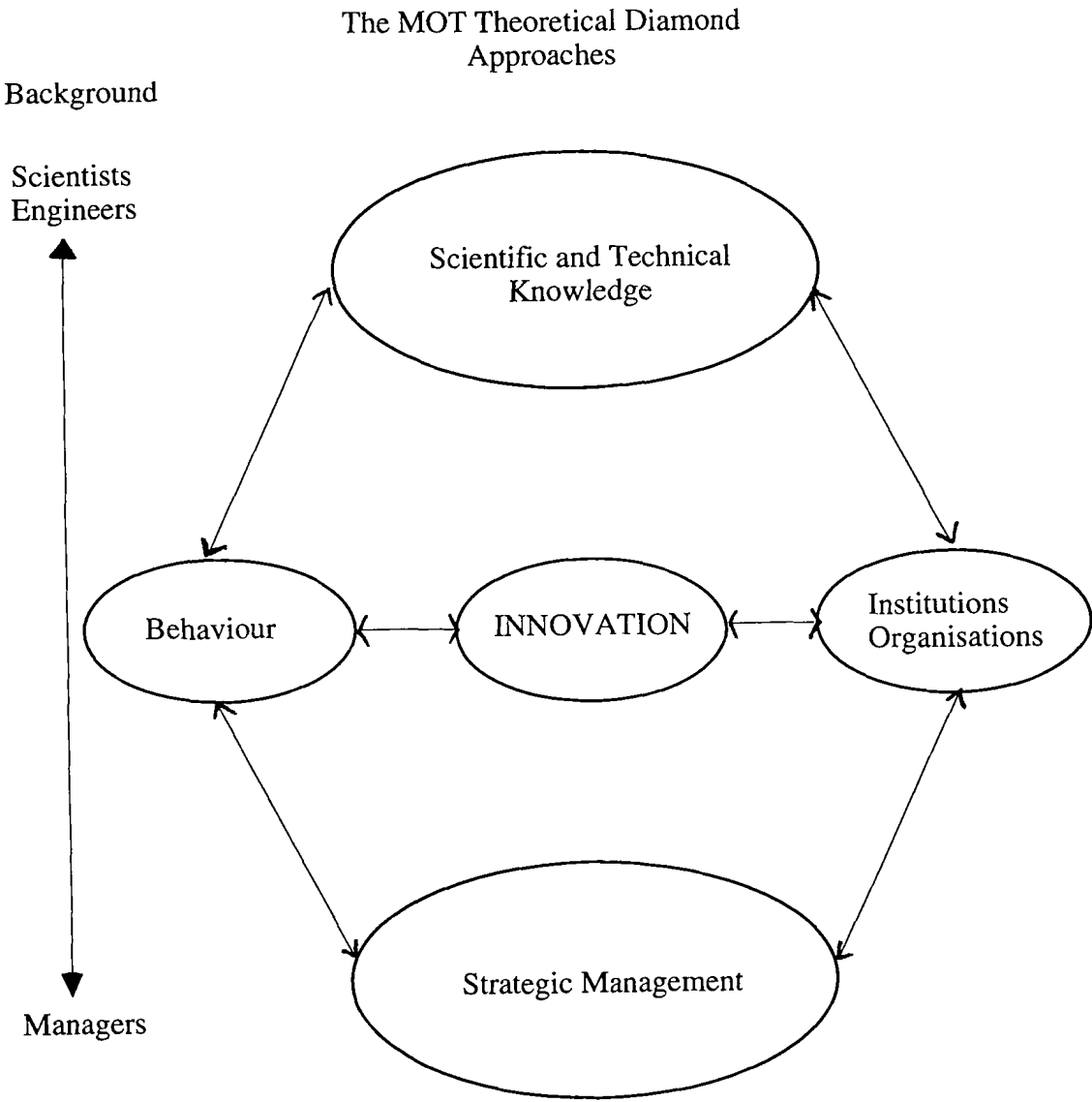Approaches

Background

Scientists
Engineers

Managers

Figure 1: The MOT Theoretical Diamond Approaches

1.3   The learning organisation and the management of technology

Since the publication in 1990 of Senge's book 'The Fifth Discipline'[3], there has been a growing interest in the 'learning organization' which he defined as 'an organisation that is continually expanding its capacity to create its future'. The concept was felt by the

organising committee to have particular relevance to the field of MOT. Where technologies are being developed and applied ever more rapidly in a market-place of constantly changing demand, the ability of the organisation to learn effectively from its own experiences and to shift to new ways of thinking is likely to be a major determinant of its competitive position.

The identification and recognition of what constitutes the firm's core competences was seen by many of the researchers who submitted papers to be an important challenge. Practical examples are helpful in illuminating theory, particularly when they are focused on approaches to implementation. However, today's core competences may well not be those needed to meet the future challenges faced by the organisation. The learning organisation should be able to avoid the trap of committing itself to a set of core competences without understanding the dynamics of the changing environment in which the business is operating.

One key contributor to successful innovation, whether in the product itself or the processes of production, is the role of the Board. Two of the contributions dealt with aspects of Board behaviour. The paper by Bart reports a study of the mission statements and their relation to the firm's innovative practices. Van Wyk takes a rather different perspective, focusing on the role and responsibilities of the Board in the MOT.

It is clear that many aspects of the 'learning organisation' in relation to MOT remain to be researched; questions such as how the lack of technological literacy in organisations can be overcome in order to enable a wider contribution to the innovation processes, how to formulate targets and measure the degree to which one has achieved a desired state, how to develop the learning culture across the supplier network where dependencies exist for the development of the firm's core technologies.

2   Towards a research agenda for the future

The second objective of the Academic Conference was to raise a research agenda through an open discussion during the closing plenary session. Some key research issues have been identified:

- It is assumed that the management of technology is still an emerging discipline which does not fit logically with the current dominant business thinking. Their rationale is still based on a disciplinary approach through a very traditional functional classification – finance, marketing, human resource, strategy, etc. The MOT requires a more trans-disciplinary vision in order to cope with variety, newness and uncertainty, all characteristics which are inherent to technological change and innovation.

  One most important research issue is then how to re-engineer business thinking in order to cope with technological change and to make MOT compatible with the functional approach which will surely remain alive. This could be achieved through conceptual and analytical research as well as in-depth case studies, including international comparisons of organisational re-engineering.

- A second research topic is the one directly derived from the discussion on tools and methods, i.e. the integration or the linkage of the various paradigms of the innovation process: behaviourist, techno-scientist, managerial, institutionalist.

This could be achieved mainly through conceptual and analytical research. Such a theme obviously deserves more research on practical tools and methods and more particularly those already experienced in enterprises.

- More specialised and dedicated research topics have been raised dealing with:
    - Analysing industry-government relationships for promoting and implementing the MOT, including training;
    - Comparing practices and models of technology management in different industries or sectors according to their level of maturity, the type of output (product, process or service);
    - Building taxonomy and classifications of sources of innovation and technical change, of types of innovation and success factors.

In conclusion, it has been unanimously stated that developing the scientific community dealing with the Management of Technology around the world should be promoted through networking and indeed the extensive use of IT.

References

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3   Senge, P.M. (1990) *The Fifth Discipline – the Art and Practice of the Learning Organization,* Doubleday.