

A SYSTEMS APPROACH TO MANAGEMENT OF TECHNOLOGY

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CERTIFICATE

The thesis entitled "A Systems Approach to Management of Technology", being submitted by Mr. Vinay Kumar to the Indian Institute of Technology, Delhi for the award of the degree of Doctor of Philosophy, is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis which has attained the standard required for a Ph.D degree of the Institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

Rapid advances in technology, increasing need of socio-economic development and the changing economic scenario in the country in respect of liberalisation and increased national and international competitiveness are exerting greater pressures on efficient management of technology, both at the corporate and national levels. This project addresses itself to the issues involved in managing technology at the national level. While several measures have been taken by the Government in managing technology, in the past, but its impact on industry or socio-economic development has not been very significant.

A detailed review of literature of past and present strategies has been undertaken. Based on this, a framework for analysis has been developed and outputs evaluated making extensive use of output indicators. A specific model expressing Science and Technology strategy in terms of its commitment, time, depth and breadth was applied to compare international S & T strategies as well as its dynamics in India. Study of management of technology practices in select countries, at the macro level, has also been undertaken.

This framework suggests a number of areas of deficiency, notably, absence of suitable linkages and prioritisation of related technologies with socio-economic goals,

only partial implementation of technology policy and absence of use of scientific or operations management tools. There is a lack of inputs on technology management discipline to students, practicing managers or engineers either through the education system or industry run programmes. Contrary to the general belief that in industrially advanced market dominated economies the Government has little role to play in technology management, the analysis suggests, that even in these countries it has a major role.

Based on these conclusions certain recommendations have been formulated. These are grouped under the broad categories of (i) general, (ii) those relating to self development of technology, (iii) acquisition of technology, (iv) building up support systems and (v) mechanisms for implementation. An important recommendation relates to need for systems approach and scientific methods of managing technology for achieving higher efficiency. Extensive use should be made of consensus systems methodologies in framing technology policy, in establishing linkages and in selection of technologies. A few examples of their application in actual situations have been demonstrated. A course on technology management discipline, with specific areas of coverage, for engineering and management education system has been designed. Major limitations of study and future areas of work have been suggested. Some of the recommendations made in this dissertation have been implemented or are in the process of implementation, signifying their relevance and importance.

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