

**SELECT ASPECTS OF INFORMATION SYSTEMS IN INDIAN RAILWAYS:
A DIAGNOSTIC STUDY**

By

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Submitted

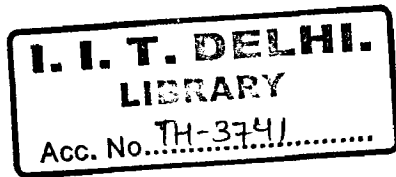
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The thesis entitled “**Select Aspects Of Information Systems In Indian Railways: A Diagnostic Study**”, being submitted by Mr. Sanjay Nayyar to the Indian Institute of Technology, Delhi, for the award of the degree of Doctor Of Philosophy (Ph.D.), is record of bona fide research work carried out by him. He has worked under our 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.



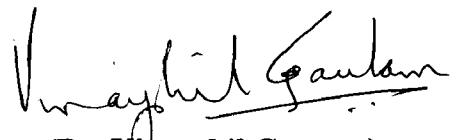
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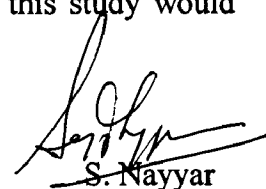
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Abstract

There have been very few studies in the implementation of information systems in the public services sector in India specifically in the area of the transport sector. Within the transport sector the railroad sector has still fewer studies. The focus of this research is to study select aspects of information systems in the Indian Railroads, performing in the ambit of the government sector and the concomitant pressures.

Some of the specific research questions posed in the research enquiry are (i) What is the stage of development of information systems in Indian Railways? (ii) What are the key enablers and inhibitors in development of information systems? (iii) Which are the work systems where Information Systems can be developed with minimum inputs? To obtain the answers to the above research questions, attempts have been made to map the evolution the information systems in Indian Railways on the Nolan's Model and identify the factors of success and failure of information systems.

These are found useful in understanding the relationship of work systems and information systems, which has been further investigated by a research model. A combination of quantitative and qualitative methods is used for the same. Two case studies of information systems development were undertaken. In addition a questionnaire survey was administered to the senior executives of the Indian Railways. The results indicate that information systems (IS) development has taken place in work systems (WS) that span across one or two layers in the organizational hierarchy. IS have also developed in WS that are limited to a single business process or a single department. In large organizations like the Indian Railways the time frame for development and implementation of IS across the organization is very large. IS development in the organization has been driven by a thrust to improve the customer-organization interface. The intrinsic infrastructure factors are the key enablers of IS in the organization. The internal systemic factors are the main inhibitors to IS development.

The main recommendations of the study are that IS should be developed in WS that have interfaces with the environment or other WS. The penetration of IS in the organization needs to be improved and the technical support systems for IS should have a high level of reliability. Finally learning from the above inputs is synthesized into a model for information systems development on Indian Railways. The model as well as the results of the study will be useful for IS planners on Indian Railways. The usefulness of the model is that it provides a parsimonious method to select those work systems in the organization in which information systems can be developed.

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