

AN INTEGRATED MULTI-SOURCE DIGITAL TOPOGRAPHIC DATA BASE FOR INDIA

by

RACHAPUDI SIVA KUMAR

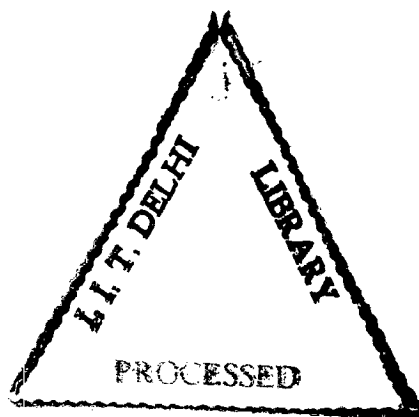
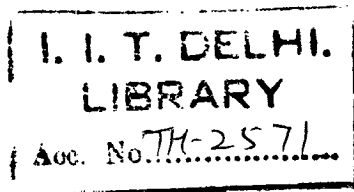
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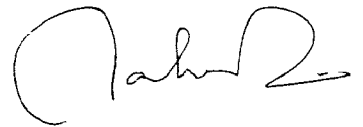
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*Dedicated to my Father
who is remembered
by many a teacher and student*

CERTIFICATE

This is to certify that the thesis entitled, “**AN INTEGRATED MULTI-SOURCE DIGITAL TOPOGRAPHIC DATA BASE FOR INDIA**” being submitted by **Rachapudi Siva Kumar** for the award of the Degree of Doctor of Philosophy, is a record of the bonafide research work carried out by him. **Mr Rachapudi Siva Kumar** has worked under my guidance, he has fulfilled the requirements for submission of this thesis, which to my knowledge, has reached the requisite standard.

This thesis, or any part thereof, has not been submitted to any other University or Institute for the award of any degree or diploma.



Dr. M.D. Joshi
Associate Professor

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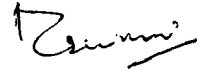
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R. Siva Kumar

ABSTRACT

Topographical maps, contain wealth of information about the terrain and other features, and they meet the needs of users in planning and developmental activities. Advances in the technology of computers, satellite sensors and other allied areas have also induced in changes in the field of surveying and mapping in the form of higher resolution satellite imagery and the Global Positioning Systems (GPS) etc.

The advances in computers provided the flexibility to use geographical information for spatial analysis and decision making with ease. The technology is nascent and still there is no working Digital Topographic Data Base(DTDB) which can take care of all planning requirements any where in the world.

To create such a DTDB for India, certain facts unique to India need to be considered viz., (a) Diversity of Indian Topography (b) Huge area (c) Availability of input data (c) Accuracy of such DTDB and the (d) Manpower requirement (e) Problem of frequent updation of DTDB. However, India has many advantages such as a large pool of skilled manpower, infrastructure for data acquisition through photogrammetry, high resolution satellite imagery in stereo mode from Indian Remote Sensing Satellite IRS 1C and

complete map cover on scale 1: 50,000. Thus any off the shelf solution can not be directly implemented. The areas which needed to be looked into keeping the above peculiarities were investigated. Maps as basic input was thoroughly analysed.

Study was carried out for comparing the accuracies of Digital Elevation Data (DEM) derived through Analytical Plotters and Digital Photogrammetry Workstations (Softcopy Photogrammetry). Similarly, material to be used for maintenance of DTDB from LFC, SPOT and IRS 1C were studied.

Automatic generalisation of digital map data was investigated using available software package and building a rule base. The quality of the data and testing procedures are discussed and the quality indicators and date stamping for temporality are attempted. A few applications were tried out demonstrating the use of DTDB.

This research work was carried out using the state-of-the-art in hardware and software. The words 'data base' were used as two separate words in this thesis to justify DT'DB'.

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