CHAPTER THREE

A MACRO-VIEW OF THE IIT SYSTEM

"The great untapped resource of technical and scientific knowledge available to India for the taking is the economic equivalent of the untapped continent available to the United States 150 years ago"

MILTON FRIEDMAN, NL

(Consultant to India's Ministry of Finance 1955)

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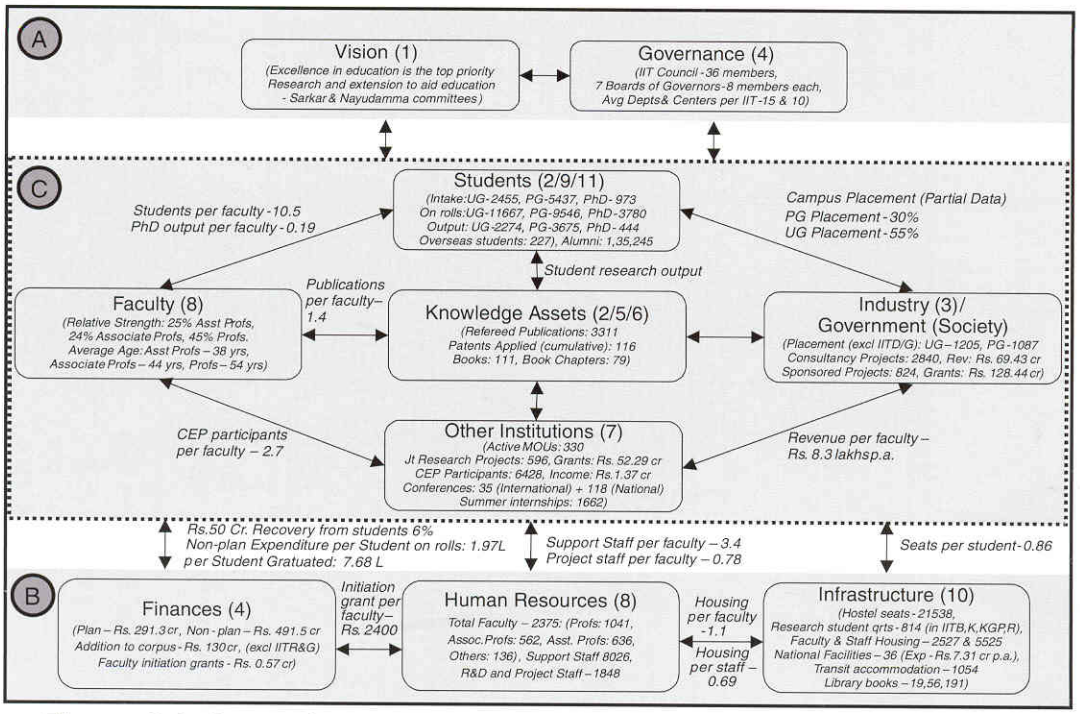
This chapter presents a view of the IIT system as of 2002-03 with reference to the framework defined in Figure 2.1. The key attributes of the IIT system have been depicted in Figure 3.1.



for a larger view see page 28

Figure 3.1: State of the IIT system at the end of the academic year 2002-03

3.1 KEY FEATURES OF THE IIT SYSTEM

Some of the key features of the IIT system (scale, resources, ratios) are highlighted below:

- **Student Output:** In 2002-03, IITs produced 2274 UG (incl. Preparatory), 3675 PG (incl. Dual Degree) and 444 Ph.D. graduates and had about 25000 students on rolls. Higher PG output suggests that IITs may be focusing more on post-graduate education. However, it may be noted that only 30% of non-UG students are absorbed by campus recruitment compared to 53% of UG students. On the other hand, a higher percentage of UG students goes abroad after graduation than that of non-UG students.

- **Faculty Strength & Productivity:** The seven IITs put together have 2375 faculty members. In 2002-03, every IIT faculty member on an average produced 2.70 students (0.96 UGs, 1.55 PGs, 0.19 Ph.D.s), 1.4 research publications and generated Rs. 8.3 lakh per annum through consultancy and sponsored research and managed 10.5 students (UG + PG + Ph.D. students on rolls). There are 4.18 staff members (3.4 administrative and support staff and 0.78 R&D and project staff) for every faculty.

- **Financial Resources:** For every rupee spent by government (plan and non-plan), the IITs are

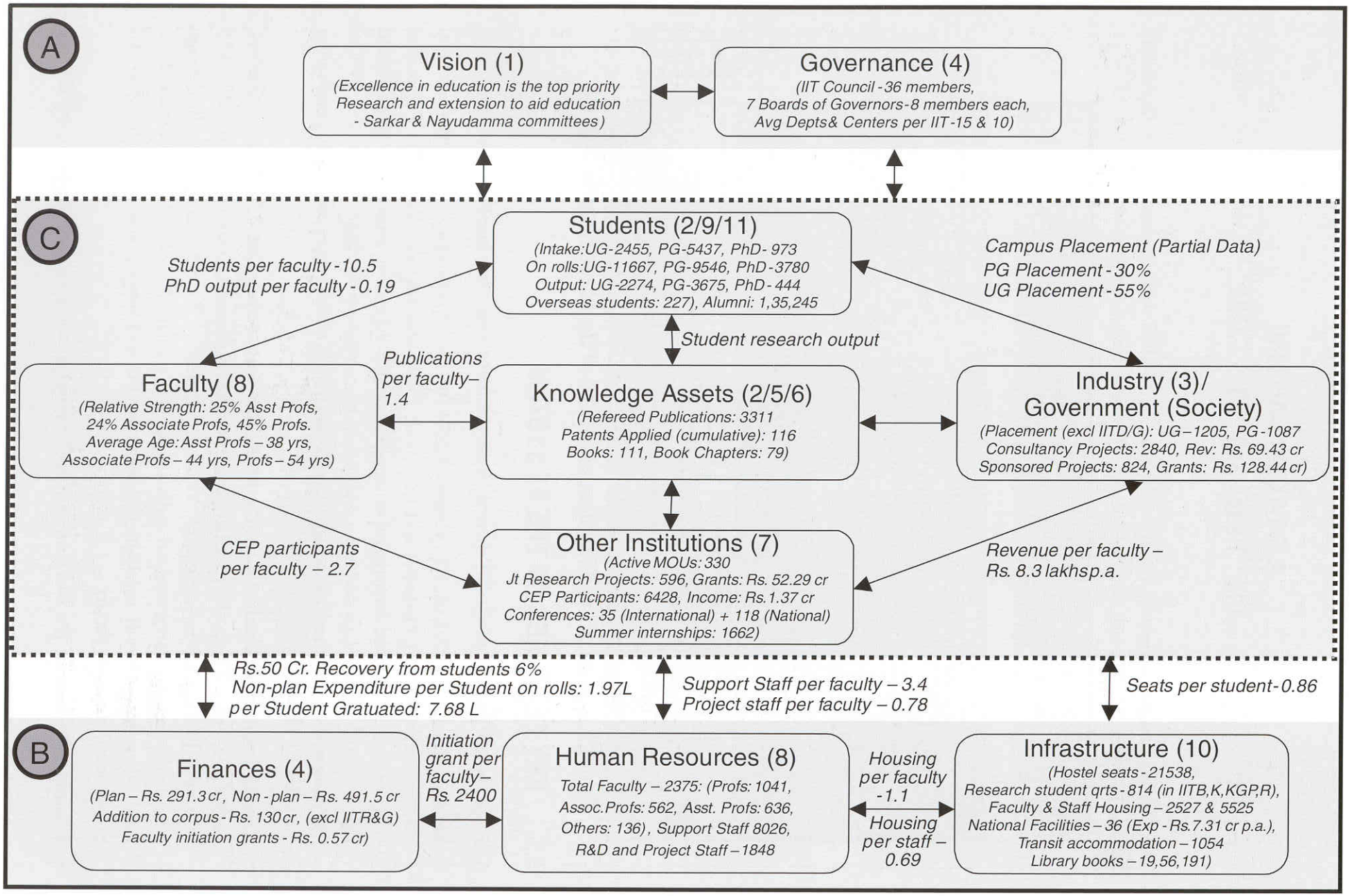


Figure 3.1: State of the IIT system at the end of the academic year 2002-03

able to generate an additional Re.0.24, through sponsored research and consultancy and make a net addition of Re.0.16 to the corpus. Recovery from students by way of fees is Re.0.06.

- **Research Infrastructure:** IITs have also accumulated a significant amount of infrastructure over time. Some of the national facilities installed in the IITs are shown in Table 3.1.

Table 3.1: Some of the national facilities in IITs

IIT	National Facility
IITD	• National Centre for Upgradation of Textiles Education • National Resource Centre for Value Education Engineering • Biotechnology Information Sub-centre • Indo-French Unit for Water and Waste Technology • NISSAT's Windows to Information Support Services for Entrepreneurs • Educational Technology Service Centre
IITM	• Regional Sophisticated Instrumentation Centre • Centre for Computational Fluid Dynamics • Ocean Engineering Centre
IITK	• National Information Centre of Earthquake Engineering • National Wind Tunnel Facility • Atomic Force Microscope • Advanced Centre for Materials Science • Advanced Centre for Electronic Systems • Flight Lab • Facility for Ecological and Analytical Testing
IITKGP	• Post Harvest Technology Centre • LSI Design Centre • Centre for Education Technology • National Facility in Medical Technologies • National MEMS Design Centre • Rubber Technology Centre
IITB	• Geotechnical Centrifuge Facility • Sophisticated Analytical Instrumentation Facility • Centre for Software Validation and Verification • National Facility for Photo Labeling & Peptide Sequencing in Biomolecular Systems • National Facility for Single Crystal X-ray Diffractometer • National Facility for Texture and Orientation Imaging Microscopy
IITR	• Thermal Ionisation Isotope Studies • Electron Probe Microanalysis • Shake Table Facility • Wind Tunnel Facility • Strong Motion Facility Network • Instrumentation and Analytical Facilities

Besides substantial experimental facilities for teaching and research, IITs today possess a wealth in terms of library resources (Table 3.2).

Table 3.2: IIT library resources as of 2002-03

	IITB	IITD	IITK	IITKGP	IITM	IITR	IITG
Books	200745	215812	230024	214680	204211	237858	36841
Periodicals	1096	672	1541	1160	894	658	568
Back Volumes of Periodicals	98229	88880	155025	97538	79934	44933	17576
CD/video/Microfilms	125	4576	2420	10076	2761	3400	910
Total	**300195**	**313940**	**389010**	**323499**	**287800**	**285849**	**55895**

Note: IITD and IITK have access respectively to 4000 and 5300 electronic journals

The rest of the discussion focuses on interactions among the key players: faculty, students, industry, government and other institutions. The interactions will be analyzed to understand the characteristics of the IIT system. This will be done at three levels:

- Level 1 will present the current state of the IIT system as a whole and changes in key attributes over the past few years.
- Level 2 will tease out the similarities and differences among the individual institutes of the system. Much of the comparison will be restricted to the five older IITs (IITB, IITD, IITK, IITKGP and IITM). IITR is a relatively new entrant and IITG is a young institute.
- Level 3 will seek to extract the similarities and differences across major disciplinary categories-engineering, science, and humanities & social sciences.

The results of the data analysis at the three levels will provide the backdrop for the presentation of the Committee's recommendations on important aspects pertaining to the following key components that matter so much for the IITs' ability to reach up to higher levels of performance:

1. Vision
2. Governance
3. Faculty
4. Research
5. Education
6. Joint Entrance Examination
7. IPR
8. Industry interactions
9. Technology in Education
10. Non-Faculty Employees
11. Funding Policy and Development of IITs
12. Expansion within the country and Campuses Overseas
13. IIT Guwahati.

The following chapters 4 to 16 will deal with the above thirteen issues, respectively.