IIT Bombay Strategic Plan (2017-2022)

Supplementary Document

Indian Institute of Technology Bombay

June, 2017

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1. REVIEW OF THE EXISTING STRATEGIC PLAN DOCUMENTS

Before finalising the strategic plan for the year 2017-22, the members of Institute Strategic Planning Committee (ISPC) reviewed the progress on previous plans and their recommendations.

IIT Bombay have so far produced two strategy documents. These two documents are:

I.   IIT Bombay 2010 (published in the year 1990) and;

II. IIT Bombay Mission and Strategy (published in the year 2000)

In a way, both the document covers strategic plan till the year 2010. A capsulated view of the summary of the strategies, recommendations and selected outcomes of these two documents is provided below.

1.1 Review of IIT BOMBAY 2010 document

The document presented a preview of the Institute as it moves into the next two decades. It suggests modifications foreseen in the following sectors of the institute: structure of the Institute, educational programs, research activities, interaction with Industry and administration of the institute. Apart from detailing the future scenario, it also suggests strategies for the future which would lead to the scenario that was mentioned in the document. A summary of recommendations and selected outcome is provided in Table 1 below.

Table 1: Review of IIT Bombay 2010 document

Strategies	Recommendations	Comments
Strategy 1: To be known and remembered by its research and scholarship	• To be recognised internationally and nationally as a teaching and research institute	*Partially achieved Yet to be known as a global research university.
Strategy 2: To develop the institute as a technological think-tank of the nation	• Involvement in activities such as research, development of new technologies, consultancy for new product development and participation in policy making committees.	*Partially achieved High visibility and a positive brand image at national level.

Strategy 3: Educational program meshed with broadened goal	• Flexibility in educational programs so that it can help students and faculty in tackling new challenges, issues and problems	*Achieved PhD in interdisciplinary studies; BTech. programme reformed;DD degree MSc program and Minor course introduced
Strategy 4: Functioning of multiplicity of Institute's role.	• Establish actions, policy reorientations and reorganisation to help balance the focus between our educational programme and the multiple activities involving research and teaching of the institute	
Towards Building a Research Institute (become primarily a research institution)	• Shift in teaching from UG education to PG and PhD programmes • Concerted policy to get young research-oriented faculty • Flexible teaching schedule to accommodate research • Appoint research assistant as supporting staff • Sole accountability of faculty for the research output • Research relevant to local industries • New links with industry • Industry internship and placement • R&D for national projects & missions • Think-tank for national and international agencies • Reward for research associated with scholarship (PhD projects)	*Partially achieved • Present PG and PhD students exceed UG students • Faculty recruitment through FAN • Present project staff is around 1300

Towards a New Institute Structure (shift to interdisciplinary emerging areas)	• Shift from science and technology to interdisciplinary areas • Development of schools/departments in broad areas of specialization evolved from multidisciplinary interactions • Faculty involvement in more than one academic programmes • Significant growth in sponsored projects and consultation activity • Increase in number of funding agencies • Emergence of research areas strengthened from the national perspective • Department would either remain as small administrative units headed by a faculty member and running of educational activities/would have core facilities and staff for running academic programmes and retaining a distinct identity • Shut down old areas of activity after a thorough review and allow new research areas to grow	*Achieved • Interdisciplinary Programmes in Climate studies, IEOR, Educational Technology, System Control and Engg., Centre for Policy Studies, CTARA • Development of SoM, IDC, BSBE, ESE, etc. • Projects like NCAIR, NCPRE, CoEST, BETiC, NMEICT etc.
Interaction with the Industries	• Specific research programmes relevant to the national industrial requirements. • Student research projects based on industrial requirement • Industrial research through consultation • Technology development through technology mission, public sector organisations and defence industries • Distribution of time for research and teaching be considered • Foster infrastructure to strengthen relationship between faculty and industry • Exchange of personnel between IITB and Industry • Adjunct faculty positions • Faculty taking up part-time employment in industry • Develop Technology Park • Encourage industries to set up pilot facilities for new technologies • CEP for industry personnel • Mainstream programmes for industry personnel • Evening programmes for industry personnel • Generating funds from industries for buildings/laboratories, chair professorship	*Partially achieved • Establishment of IRCC • Development of BSBE, ESE • Establishing Adjunct faculty • Development of Research Park

| Faculty in 2010 | • Increase faculty strength to 600
• Increasing number of students to 3000, most being from PG level
• Small student-faculty ratio
• Multiple role for faculty: research, teaching, laboratory development, continuing education programmes, developmental projects, consultancy, advising on national policies etc. and with major emphasis on research and teaching.
• Recruitment drive and policy to appoint good faculty
• Financial autonomy to faculty (not just limited to standard government scales).
• Distinguished Chairs sponsored by industry, alumni, trusts and philanthropists.
• Honoraria from projects, consultancy and continuing education.
• Benefits to new faculty such as liberal relocation, initial seed money for research activity, initial book grant etc.
• Five year faculty review process
• Attractive voluntary retirement package | *Achieved
• Present faculty number is more than 600 (2016); faculty strength in 2010 was around 400
• Present student on roll is more than 10,000 (2016); student strength in 2010 was around 6500
• Present student-faculty ratio is (17:1)
• Recruitment of faculty through FAN initiative |

Education	• Radical shift from a teaching oriented to a learning oriented educational program	*Partial • Establishment of SINE
	• Reinforcement of students' commitment to a future career in S&T areas in India	
	• Programme exposing students to the development challenges of the country like poverty, environment, hygiene and health care and involve them in national projects	
	• Allowances to needy students through industry sponsorships, loans, earn and learn schemes to dissuade deserving students from not taking admission	
	• BTech. to convert into 5 years MTech programme to support research efforts	
	• PG programmes leading to four semester MTech. program in in EE, ME, Chem. Egg. etc	
	• Planned scheme of midway shift to PhD programme from MTech programme	
	• Attract international students	
	• Five year MSc. programme in Science	
	• Develop entrepreneurial activities	
	• Taking hifi calibre BSc students for longer duration MTech.	
	• Modular CEP leading to degree course	
	• Special programmes for specific organisation	
	• Courses offered from out of the department	
	• Field experience for students leading to search for technology alternatives to socioeconomic problems	
	• Access to CD ROM based learning programmes	
	• Broadened participation in project based courses	
	• No grading in the initial one year of UG but students with inadequate performance may leave	
	• Perception of technology career strengthened by introducing engineering courses.	

Administration	• Department/school to be managed by a "Laboratory Manager" a faculty level post with competent techno-managerial experience. • 1-2 secretaries to each small group of 4-5 faculty members. • Enhanced Computer aided learning • Central Workshop to support fabrication requirement of research projects • Increased computer facility in administration (ERP) • Decentralised access to information and records • Profiling research and developmental publications done in India and use it for references in course work • Tie-up with renowned publishers for circulation • Administrative Reform Cell • Continuous training of staff	*Not achieved
Autonomy	• Academic freedom • Complete administrative autonomy • Financial autonomy • Decrease dependency on government grant • Resource generation through alumni, industry, CEP, tuition fees • Revenue target of 50% of the plan outlay complementing government funding.	*Partial

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1.2 Review of IIT BOMBAY MISSION AND STRATEGY document

The last strategic planning document of the Institute was drawn up in the year 2000. It had developed broad directions and priorities for IIT Bombay over the longer period. It served as a general framework for decisions on research and education as the twin pillar, but not so much detailed to determine such decisions. The strategic planing effort was a ddressed around six key issues: People-student, faculty and staff; Research focus; Innovations in education; External linkages; Support systems; and Resource mobilisation. A summary of the initiatives taken and some selected outcomes are mentioned in Table 2 below.

Table 2: Review of the Existing Institute Strategy Document

Key Issues	Initiatives	Selected Outcomes
I. People-Student, Faculty & Staff	Create an outstanding environment for research students and young researchers.	*Partially achieved It's done on a regular basis. The Central Facilities such has RIFC, SAIF, purchase of high-end laboratories equipment, software, safety of laboratories, 24x7 operations and many such improvements have taken place. Centres of Excellence (CFDVS, CASDE, CEN, CAD, etc.) and National Facilities have been set up. Healthcare Consortium was created.
	Launch a drive to attract the best students for the post-graduate programmes.	*Partially achieved It's an ongoing process of the institute. The quality of the programmes and training of the students has gone up. The senate have reviewed and have initiated reforms in several programmes. Dual Degrees (5 year integrated MSc. and MSc-PhD), MDes., EMBA programmes were introduced
	Enhance diversity of the student body by augmenting support to under-represented groups.	*Partially achieved Gender diversity has been achieved at PG and Ph.D level although this has not been seen at UG level. A very good regional diversity has been seen with students from all over India. The social diversity is at its peak with a ratio of 50:50 (General: Reserved category).

	Allow for a variety of faculty positions with recruitment and promotion on a continual basis.	*Achieved Sustained recruitment and promotions exist in the Institute. Adjunct Faculty and Chair Professorship positions were created.
	Provide ample resources and support to faculty for their research aspirations and increase the faculty strength to 600 over the next 5 years.	*Partially achieved Providing resources and support to faculty is an ongoing process although a lot has to be done. The pool of research support staff have reached 1380 personnel. Sustained recruitment of top-quality faculty in the last 17 years has led to an increase in strength to around 600.
	Allow faculty to be involved in new knowledge-intensive start-ups that emerge out of their research.	*Achieved SINE and Business Incubation, Technology Business Incubator was established. Research park is being set up. Leveraging on Make in India and Digital India initiative of GoI by imparting R&D to various sectors.
	Create mechanisms and systems to motivate and reward supporting staff.	*Not achieved Need to work more in this aspect.
II. Research Focus	Increase the level of support to research across the board.	*Partially achieved Improved facilities, inter-disciplinary centres, consortia and centre of excellence were created.
	Periodically identify research areas for special funding.	*Partially achieved It's an ongoing process in the institute. However as mentioned in the document the Institute Research Council could not be established.

	Diversify into non-traditional areas, which will provide the richness associated with a stimulating research environment.	*Achieved C-USE, CTARA, Educational Technology, Climate Studies, SoUL were created.	
	Take specific initiatives to encourage cross-disciplinary research.	*Achieved IEOR, CTARA, Climate Studies, C-USE have people from different departments and adjunct faculty from industry.	
	Restructure workspace and facilitate the acquisition or development of sophisticated experimental facilities in critical areas.	*Achieved Establishment of RIFC and central facilities.	
	Evolve a plan for periodic upgradation of computational resources, analytical facilities and the digital content of the library.	*Partially achieved No plans but upgrading takes place on regular basis, e.g., RIFC, digitalisation of central library.	
III. Innovations in Educations	Encourage open-ended problem solving and independent study.	*Not achieved Need to work on this.	
	Encourage cross-disciplinary courses at senior level.	*Not achieved Some are available but more need to be achieved.	

	Increase the flexibility of the programmes, and decerease the number of courses required.	*Partially achieved Concept of additional learning, tagging of courses have been introduced, minor course, reformation of BTech. programme	
	Provide for more categories of students, including students living off campus and part-time students.	*Partially achieved The number of categories may not have increased, however the number of students have increased. Industry focussed courses (MTech in MMM), EMBA, PG Diploma in Distance mode have been introduced. QIP by GoI.	
	Evolve a policy for web-based education as a supplement to classroom education.	*Achieved NPTEL, MOOC, PG Diploma in Distance mode have been established.	
IV. External Linkages	Continue and enhance the institute's involvement in projects of national importance.	*Achieved Achieved through projects like NCPRE (GoI, MNRE), NCAIR (Boeing Centre-DST), CoEST (Ministry of Steel), BETiC (GoM-DST), NMEICT (MHRD), NCETIS, NAMPET and creation of many centres of excellence.	
	Increase industry involvement and participation in institute activities.	*Partially achieved Although existing but a long way to go. Internship, Adjunct Faculty, special MTech courses (e.g., MMM), CEPs are some ways of involving industry.	

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	Create a suitable interface structure for exploiting intellectual projects and commercializing technology through technology incubation, transfer and licensing.	*Partially achieved IP policy was revised by BoG in 2012. However more need to be done in formalising the process.
	Encourage faculty involvement in regulatory and policy making activities at different levels (local, state and national government).	*Partially achieved Centre for Policy Studies have started to strengthen the engagement.
	Increase linkages with other educational institutions both in India and abroad, which may include collaborative research projects and student & faculty exchange.	*Partially achieved Office of International Relations was created. Establishment of IITB Monash Research Academy, EMBA course of Washington University at St. Louis, MoU with NUS, NTU etc. Internship for students from all over India.
	Strengthen and elevate outreach with alumni and public at large.	*Achieved IIT Bombay Development and Relations Foundation (IITBDRF) has been set up to enhance this.
	Create Departmental Advisory Boards.	*Not achieved A few departments have done it (e.g., EE).

V. Support Systems	Create support systems that will offer reliable and quick services.	*Not achieved
	Exploit Information Technology to enhance efficiency and effectiveness of support services.	*Achieved ERP system is being set up to achieve this.
VI. Resource Mobilization	Setup appropriately sized endowments essential for creating and upgrading the ambience for research and development.	*Partially achieved So far the institute could able to achieve only Rs. 200 crores and still lack a proper endowment.
	Constitute an Institute Planning Board.	*Achieved Started again with the Institute strategic plan for the year 2017-22.
	Strengthen financial planning and control.	*Not achieved In view of shortage of funds this has become difficult.
	Setup formal mechanisms for systematic dissemination of institutional achievements and needs.	*Not achieved Unlike other IITs, IITB lacks a regular interaction through Facebook,Twitter and other means of social media and outreach.
	Structure resource mobilization efforts.	*Achieved Being done through IITBDRF

| | | Elicit the help of professional organizations for Resource Management. | *Not achieved |

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2. OVERVIEW OF THE STRATEGIC PLANNING PROCESS

The 2017-22 strategic planning process was an extensive effort of IIT Bombay to engage all stakeholders from IIT Bombay community- students, faculty, staff, alumni and industry. The flowchart for the process has been illustrated in Figure 1.

Figure 1: The Strategic Planning Process
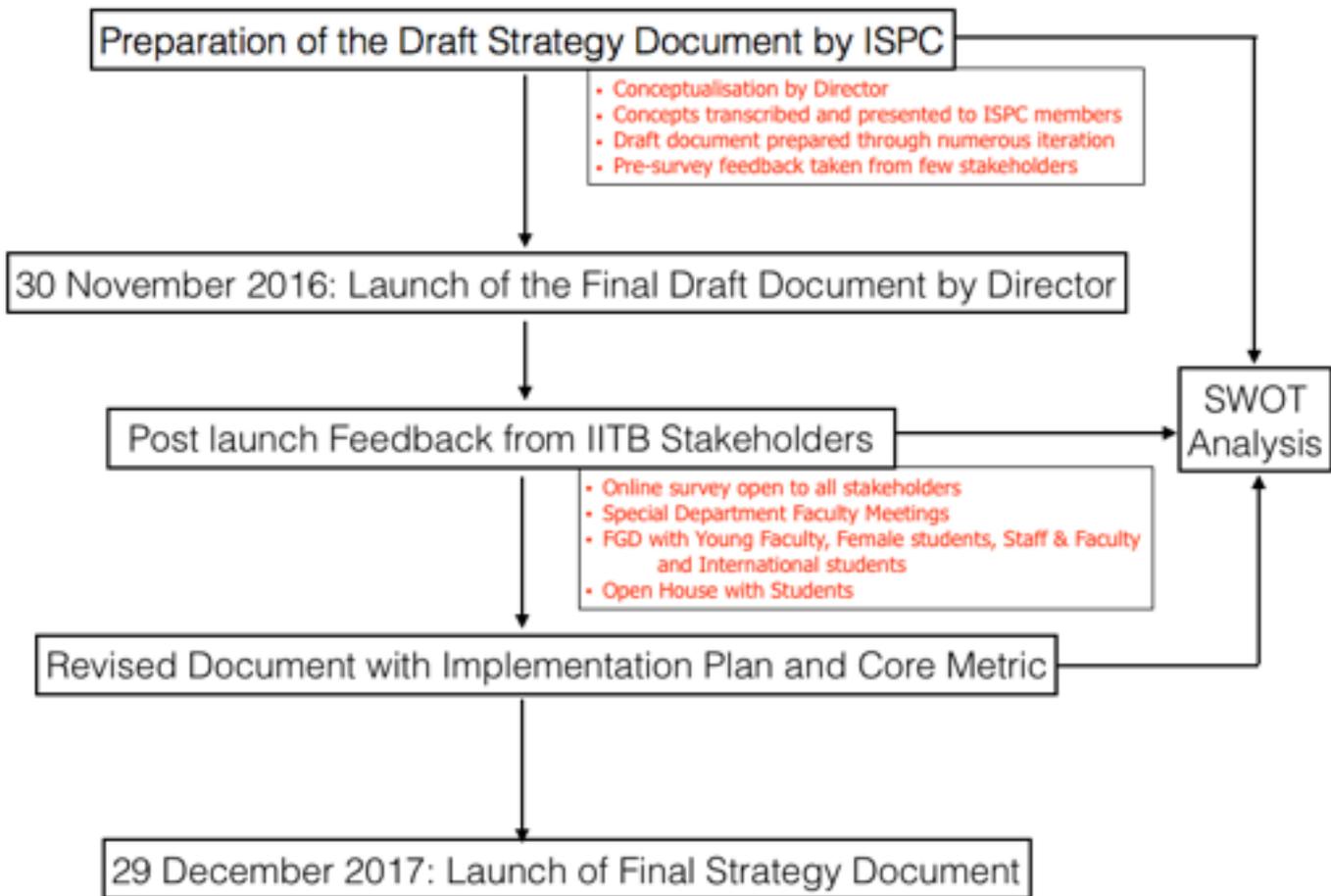
3. SWOT ANALYSIS OF IIT BOMBAY

IIT Bombay's strengths, weaknesses, opportunities and threats (SWOT Analysis) were identified by members of ISPC during a brainstorming session. This process led to the development of the SWOT matrix which is illustrated in Table 3 below.

Table 3: SWOT Matrix approved by ISPC

<table>
<tr><td colspan="2">SWOT Matrix of IIT Bombay</td></tr>
<tr><td>STRENGTH</td><td>WEAKNESS</td></tr>
<tr>
<td>

Ability to attract best students and faculty with excellent international research credentials
Academic reputation
Residential campus
Location
Rigorous academic programmes in diverse areas
Cutting-edge research facilities with shared open access
Strong administrative system with a modern enterprise resource planning system (SAP based)
Strong alumni engagement and support
Thrust on entrepreneurship and industry interaction

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<td>

Infrastructure deficit for student and faculty residences as well as academic buildings
Low number of international students and faculty
Low number of postdoctoral fellows
Low numbers of women students and women faculty members
Low level of international engagement in terms of conference participation
Ageing buildings requiring upgradation

</td>
</tr>
<tr><td>OPPORTUNITY</td><td>THREAT</td></tr>
<tr>
<td>

Expand educational and research programmes to address needs of local industry (e.g. manufacturing, healthcare finance, entertainment)
Leverage existing credibility of the institute with local government to work on projects in rural areas
Potential for enhanced fundraising from alumni and other well wishers
Potential to deliver advanced education content online, on a large scale, based on existing strengths

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Increasing competition from other institutions for faculty and students
Shortfall in funding for the scale of operations

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