The rise of the technological manager in India in the 1960s: the role of the Indian institutes of management

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ABSTRACT

A distinctive aspect of India's managerial elite is that it is dominated by people with an educational background in engineering. This paper unravels the history of how this major phenomenon arose, by tracking the evolution of management education in mid-twentieth century India. It emphasizes the significance of the network developed between the Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs) and points to important contextual factors including the industrial recession of 1968–70 and admission test criteria that contributed heavily to the rise of the 'technological manager'. Some of these factors continued to be important in the early twenty-first century, having implications on the diversity of educational backgrounds and diversity by gender among India's managerial elite.

Introduction

In 2016, one hundred and forty four Chief Executive Officers (CEOs) of the top five hundred companies listed on the Bombay Stock Exchange in India held MBA-equivalent postgraduate degrees in management (Bhuyan 2016). The Indian Institute of Management Ahmedabad (IIMA), ranked among the Top 30 business schools in the world by the Financial Times ranking of Master in Management programs 2019, accounted for twenty CEOs in this list, followed by other business schools in India and outside India. Virtually all the management degree-holding CEOs were engineers and standalone engineering degree holders comprised another eighty one CEOs. That is, nearly half of the CEOs of the Top 500 firms in India were engineers. In 2015, among the incoming cohort of management students at IIMA, close to ninety per cent had an undergraduate degree in engineering, and around a third of those students had studied at the prestigious Indian Institutes of Technology (IITs). To put these figures in some perspective, less than forty per cent of the incoming cohorts at the Harvard Business School (HBS) over the past several decades had prior degrees in Science, Technology, Engineering and Mathematics (STEM) fields.[1] In the top hundred business schools outside India, ranked by the Financial Times, the share of science and engineering students in recent batches, were at similar magnitudes as HBS.[2]

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Why then is the managerial elite of India dominated by engineers? The literature on the evolution of management studies or the development of managerial capitalism in India has so far not addressed this question. One strand of literature has focussed on institution-building in the field of management education (Hill, Haynes, and Baumgartel 1973; Tandon 1980; IIMA 1994; Misra and Chand 1999; Anubhai 2011; Ram Mohan 2011; IIMC 2012). An emerging strand of scholarship looks at the nature of early international collaboration in Indian engineering and management training and education (Bassett 2009; Kumar 2019). Tripathi (2013) points out how management education and 'managers' became acceptable in the largely family-controlled business landscape of late twentieth century India, with the advent of the IIMs. Masrani, Perriton, and Alan (2018) argue that management development programmes also developed outside the educational sector through internal training programs, as witnessed at Tata Sons between 1940 and 1960, while Srinivas (2009) observes the ways and processes in which management knowledge was transferred to India in the late twentieth century. But the scholarship to date has not paid attention to these *distinctive* aspects of India's managerial elite and the background of management students.

This article shows how management institutes in India turned away from initial ideals of bringing in diverse educational backgrounds to a phenomenon of engineering dominance by the end of the 1960s. It ties closely with the work of Ross Bassett who developed the concept of the 'technological Indian' in the twentieth century by studying the close connections between Indian engineering and technical education and the USA (Bassett 2016). The 'technological Indian' abroad led to a surge in perceptions about India even if it may not have led to a 'technological India'. This article shows that the 'technological manager' of India is an additional category that merits attention and the peculiar circumstances under which this phenomenon was created in leading management institutes.

The article uses archival data from three key institutions – the Indian Institute of Management Ahmedabad (IIMA), the Ford Foundation and the Harvard Business School. The rest of the article is arranged as follows: The next section provides a background on the creation of the IITs and IIMs in India. The subsequent section studies how the engineering phenomenon emerged at IIMA in the 1960s followed by a concluding section.

The birth of the IITs and IIMs, 1945–1961

The British colonial state invested heavily in the Indian railways, but did not activate large-scale industrialization. The Tata's steel project in the first decade of the twentieth century was a major milestone in Indian manufacturing and it was significant that the firm imported a large number of engineers and technicians from the US for that project, underlining the dearth of local talents (Bassett 2016). The early twentieth century marked engineering as 'the birth of an Indian profession' since engineers were valued in the Public Works Department, Railways, and large industrial setups (Ramnath 2017). But the number of engineers and engineering colleges in India was still small when British rule ended in 1947.

India's first Prime Minister, Jawaharlal Nehru, pushed for heavy industry and laid a great emphasis on developing the stock and caliber of engineers. This was to be achieved by building great institutions of higher education, through technical collaboration with the

relatively more developed countries. The All India Council for Technical Education (AICTE) was formed in 1945 and a 1946 official report of a committee chaired by N. R. Sarker proposed the establishment of four technical institutes in different parts of the country, modeled on the lines of the Massachusetts Institute of Technology (MIT). MIT had established a strong connection with India through technical education in the early twentieth century (Bassett 2016) and came to play a significant role in assisting higher educational projects in India in the 1950s.

The first Indian Institute of Technology (IIT) was formally inaugurated in 1951 in Kharagpur in eastern India with support from the US, the UK, the Soviet Union and UNESCO (Mehrotra and Sah 2015, 9–11). In 1958, a second IIT was founded in Bombay in western India through a tie-up with UNESCO and the Soviet Union. In 1959, the third IIT was founded in Madras in south India with technical assistance from West Germany. In 1959–60, the fourth IIT was set up in Kanpur in north India, with assistance from nine American Universities, dubbed as the Kanpur Indo-American Programme and it soon grew as an important hub for computer sciences (Bassett 2009). In 1963, another IIT was founded in Delhi, with some assistance from the UK.

These five IITs soon became the leading institutions to offer engineering education in India and their students were coveted by industry and research departments around the world, leading to warnings of 'brain drain' in the 1960s. In addition, several other private engineering colleges also sprang up in India and by 1967, around 10,000 engineering graduates were being churned out annually in India with around 1,000 graduating from the IITs (Bassett 2016, 282). Like the civil services, engineering and especially entry into the IITs was fast becoming an aspirational dream for many (King 1970b).

International collaborations with different countries to set up the IITs in the 1950s occurred due to Nehru's nonaligned movement under Cold War politics. In contrast, management training and education institutes experienced a clear US-UK tilt (Kumar 2019). In pre-colonial and colonial India, a form of management training and education was in-built within the business castes through an elaborate apprenticeship and indigenous businesses were strongly controlled by families and particular castes and communities. British enterprises in nineteenth and early-twentieth century India grew through a unique organizational form called the managing agency system whereby the 'managing agent' provided managerial services to a diverse set of industries promoted by either themselves or others, usually for a fee or a commission, but eventually through important controlling stakes (Basu 1958). The managing agents were almost entirely British, though important Indian business houses such as the Tata's and Birla's began their own such ventures in due course. In British firms, the unspoken norm would usually be to reserve top management for the British, middle management for the Anglo-Indians and the third rung for the Indians, as observed in the retailing giant – Spencer's – in Madras (Muthiah 1997). In subsidiaries of foreign multinationals in India, Indians were usually third-level managers with few chances of promotion (Chowdhry 1966). A market for managerial talent was constrained by paucity of both demand and supply; Indian family managed firms rarely looked for outside management and no system of formalized management education existed, outside courses in commerce or economics. Douglas Ensminger (1910–1989), a trained rural sociologist, Ford Foundation's representative in the Indian subcontinent from 1951 to 1970 and a pivotal figure in the creation of the IIMs, observed that traditional family businesses in India appointed members of the family to 'look after' industrial plants rather than inculcating

independent decision making abilities and that a similar case could be made for the civil service officers in the public sector who bowed down excessively to hierarchy.[3]

The first effort toward formalizing management education came after Independence, when the Council for Technical Education established the Industrial Administration Business and Management (IABM) Committee in 1948–49, chaired by Jehangir Ghandy who was closely associated with the rise of Tata Iron & Steel Company. The committee's report was published only in 1953 and it made three recommendations: The establishment of a National Institute of Management to supervise management education initiatives, the establishment of a Board of Management Studies to explore university level partnerships and the setting up of an Administrative Staff College on the lines of the Administrative Staff College in Henley, UK (Hill, Haynes, and Baumgartel 1973, 11–13). In the same year, the Bangalore Management Association (BMA) was set up in south India and the Indian Institute of Social Welfare and Business Management (IISWBM) was set up in Calcutta as a public-private partnership between the University of Calcutta, governments of West Bengal and India and local industrialists.[4] The year 1953 therefore constituted a watershed moment in India's drive toward 'making managers.'

Management associations sprung up in Bombay in 1954, in Delhi and Ahmedabad in 1955, in Madras in 1956 and in Calcutta in 1957, culminating in the All India Management Association (AIMA) set up as the nodal coordinating body in 1957. Charat Ram, President of AIMA, was keen to mold the association on the lines of the American Institute of Management and approached Ensminger for assistance.[5] With the help of the Ford Foundation, AIMA started a summer management development program in Srinagar in Kashmir for leading managers with technical assistance from the Sloan School of Management at MIT. Ensminger established American practices at the level of training existing managers through MIT-led management pedagogy but he also craved for management centers that would train managers from scratch, outside the traditional Indian university system.[6]

Taking various stakeholders in India and US into confidence, Ensminger arranged for two reports to be published by American management educators on the need for management institutes in India outside the university system in quick succession. The first report of 1957 was by a team from Harvard and was authored by Merriam and Thurlby and the second report in 1959 was by George Robbins, Dean of the Graduate School of Management at the University of California Los Angeles (Hill, Haynes, and Baumgartel 1973). The Robbins report was crucial in setting the outline for a proposed 'All-India Institute of Management'. Robbins recommended it to be regarded as a 'high-priority national asset' with a lot of autonomy. On the matter of student selection, he stressed the following: 'Every effort should be made to encourage applicants with backgrounds of under-graduate study in a variety of fields such as engineering, mathematics, natural sciences, social sciences and the behavioral sciences. Since the art of management is supported by all these disciplines, a student group representing a variety of them will be stronger than one with uniform experience (Robbins 1959, 13).' The first vision of management education in India was therefore a holistic one that called for diverse backgrounds to assemble in the classroom.

Based on Robbins' report and further round of consultations with many stakeholders, two IIM's were set up in 1961 in Calcutta and Ahmedabad, through technical collaboration with MIT's Sloan School of Management and HBS respectively. This was in line with the widespread 'Americanization' of business education that was occurring around the world

in the first decades after World War II (Amdam 2008). Bombay lost out due to political bickering at the University level, Ahmedabad gained due to scientist and industrialist Vikram Sarabhai's enthusiasm and persistence and Calcutta exerted political pressure to get its own institute. Both IIM Ahmedabad and IIM Calcutta began by offering short-term management development programmes, soon followed by their flagship two-year management programme in 1964. The pedagogies in IIMA and IIMC were substantially different with HBS transplanting the case method and MIT the lecture and seminar method, but over time, both institutes learnt from each other's methods (Hill, Haynes, and Baumgartel 1973).

IIMA in particular was conceived through partnerships between various stakeholders – the central government covered the annual revenue expenditure, the state government of Gujarat provided the land, industry supported the building programmes and the Ford Foundation facilitated the development of academic facilities, library and even the faculty (IIMA 1973, 7). As part of a five-year collaboration with HBS, Indian faculty were trained at Harvard and subsequently this led to the strong usage of Harvard pedagogical designs including the case method at IIMA. The Harvard influence on IIMA was strong but not overwhelming such that several innovations were possible in educational programmes, admission criteria, and student placement methods. For instance, a unique 3-tiered executive education programme was launched in 1964, attracting managers at three different levels of the same firm to apply for the programme in a particular sequence so that the education imparted would be more widely practiced within the firm. According to Samuel Paul, Director of IIMA from 1972 to 1978, the initial HBS report that laid out Harvard's action plan did not see it as their 'responsibility to develop the Institute and turn it over to the Indians' but for more cooperative efforts with mutual understanding of goals and efforts (Paul 2010, 74). Institution builders such as the eminent Ahmedabad-based industrialist Kasturbhai Lalbhai, the scientist and first honorary director of IIMA, Vikram Sarabhai, the academic Dr. Kamla Chowdhry, the professional manager Prakash Tandon (Chairman of IIMA, 1964–69) and Ravi Matthai, the first full-time director of IIMA appointed in 1965, all contributed to lay strong foundations of the institute. Separately, the renowned American architect Louis Kahn was hired to design one of the most iconic university campuses of the twentieth century using red bricks and arches (IIMA 1969).

The discussion so far has outlined the circumstances in which the IITs and IIMs were created. Engineers were not dominant in managerial roles at that stage. In the early 1960s, an important study on the social origins of nearly 2,000 Indian managers working in large firms revealed that less than two per cent had a formal management degree (Jain 1971, Table 5). Over ten per cent had a background in commerce and accounting and over twenty per cent had a background in physical and natural sciences. Engineers comprised a third of the pool of managers, slightly higher than other fields but clearly not the majority of the group. The results of a survey conducted by IIMA in 1963 on willingness to join the MBA program revealed only 28% positive cases across different educational backgrounds.[7] The figure for engineers was 24%, that is, lower than the average. The next section shows how the engineer-manager or the technological manager rose from this situation to total dominance by 1970.

Selection into IIMA and the rise of the technological manager in the 1960s

IIMA's management programme was designed as a two-year full-time programme with three semesters in each year. There were core courses in the first year followed by mostly elective courses in the second year. There were ten first-year courses in the initial years, some stretching across semesters[8]: Finance, Mathematics, Organizational Behavior, Managerial Economics, Managerial Accounting, Marketing, Manager and the Indian Economy, Production, Business History and written Executive Communication. Only two courses required some proficiency in Mathematics and in general, the programme was designed so that students of different disciplinary backgrounds could feel comfortable with all the courses.

For the first incoming cohort of management students in July 1964, considerable preparations, advertisements, and outreach campaigns were conducted by IIMA to attract quality students. Prospective students had to mail the institute for the application form and then send back the filled-in application form with an application fee of Rs. 10.[9] During a review of applications in December 1963, the Admission Committee consisting of IIMA faculty members C. N. S. Nambudiri (Chairman), V. L. Mote and Asghar Karim, reported that they had received 682 applications with the following category split: Engineering (44), Law (94), Arts (203), Science (121), Commerce (163) and Others (57).[10] During a faculty council meeting, the faculty agreed that 'there should be a good "mix" of various disciplines and varied backgrounds and of people with and without experience in the final selection' and extra-curricular activities was given due credit by the Admission Committee in the screening of the candidates.[11]

The selection making procedure had a clear emphasis on the 'development of decision-making skills involving application of knowledge' (Anand 1970, Chapter 3). There were four elements used – the application form, the School and College Ability Test (SCAT) designed by Educational Testing Service (ETS) Princeton, a case discussion and an interview. This differed slightly from the HBS practice which used a more specialized test service for business studies and asked for reference letters.[12] The application form to IIMA followed the HBS template and asked for information on age, sex, previous academic record, work experience, extra-curricular activities and a few other details. The three members of the Admission Committee then judged these forms as being either acceptable (A), borderline (B) or reject (R) and applicants with AAA, ABR, BBB and BBR ratings were called for the interview (Anand 1970). The IIMA Admission Committee decided against having a screening test on the grounds of travel costs for students to centers and that it was unlikely to provide any additional information than the application form.

Students shortlisted on the basis of the application form were then invited for the SCAT, case discussion and interview. In selecting the test, the principle used was that it should be able to assess basic abilities of students irrespective of educational background and the first year courses of the management programme were also designed keeping this in mind (Anand 1970, Chapter 3). A test developed by the Indian Statistical Institute (ISI) in Calcutta was not considered because it was lengthy and the level of mathematics was very high and hence the SCAT was chosen. The SCAT required only one hour and fifteen minutes and could be scored manually or by a machine. It had four components, two for verbal skills with thirty questions on each component and two for quantitative skills with twenty-five problems on each component. The tight time-bound nature and

emphasis on quantitative reasoning was isomorphic to the Joint Entrance Examination (JEE) of the IITs. The Admission Committee referred to the SCAT score only to clarify doubts they had over candidates during the interview stage and no minimum cutoff scores were prescribed.

The case discussion was conducted in groups of ten to twenty students to familiarize the faculty with the students and to expose the students to the case method of teaching. There was no quantitative score for this element of the selection process. A personal interview of fifteen to twenty minutes completed the process and a categorical rating scale was used to judge students. The SCAT, case discussion and interview occurred on the same day for each student and occurred across nine cities in the first year of admissions.

Eventually in 1964, there were around 7,500 enquiries and 747 applications, of which 361 applicants were called for an interview at various centers in India, among whom 58 students joined the new programme. As described in Table 1, students with Science and Arts backgrounds comprised a third each of the cohort, followed by Commerce (22%). Engineers comprised only two per cent of the applicant pool but comprised ten per cent of the selected student body. One of those selected engineers was interviewed as part of the IIMA oral history project in 2018 where he said that he applied to IIMA in 1964 only because he had lost his job early that year and had time to explore new opportunities as the timeframe for fresh engineer's recruitment was much later in the year.[13] One of the two female students who graduated from IIMA's first batch of 48 students came from a commerce background and reflected that she applied to IIMA in 1964 because she thought she could get 'Harvard professors at a fraction of the cost of Harvard, and not be bonded to work anywhere by taking a loan' for her studies.[14]

In the first batch, the average age of the students was 20.8 years and nearly two-thirds of the cohort had some prior work experience. Some of the students in the first cohort were sponsored by firms and the government. The selection was praised in the Institute's annual report as 'a good mix of persons hailing from various parts of India with different educational backgrounds- Engineering, Science, Liberal Arts, Commerce.'[15] Later, it was also noted that there was no difference observed in academic grades obtained between students of different educational backgrounds in the programme implying that the 'design of the institute to admit students with diverse educational backgrounds was essentially sound' (Anand 1970, 26).

In the second batch of students, the number of applications increased by twenty per cent but student intake was nearly doubled to 95. The share of engineers was lower than the first batch and stood at 6.3%. There was greater response from Bombay, Calcutta and Madras regions as more course-related information was made available to the colleges and universities of those places.[16] In a faculty meeting in March 1965 it was noted that 'quite a lot of time was spent in the preliminary scrutiny of applications and also in the selection of candidates through SCAT tests, case discussion and interview.'[17] The Admissions Committee Chairman noted that 'more importance was given to application and SCAT tests and not to interview.' During the year, a mathematical skill profile was drawn of each student admitted to IIMA, in the hope that this would clarify the teaching needs of the faculty.[18] Weakness in mathematics was singled out as a big reason why some students had performed adversely in the program, though the overall difference between engineers and non-engineers was not stark.

Table 1. Background of students in the flagship two-year MBA-equivalent degree at IIM-Ahmedabad.

Year of Entry	Number of Applications Received	Number called for interview and tests	Number joined the programme	Educational background of applicants and students							
				Arts %		Commerce %		Science %		Engineering %	
				Applicants	Students	Applicants	Students	Applicants	Students	Applicants	Students
1964	747	361	58	39.4	31.0	30.1	22.4	28.5	36.2	2.0	10.4
1965	922	448	95	40.6	39.0	22.5	14.7	34.5	40.0	2.4	6.3
1966	1,682	513	87	37.3	26.5	21.4	16.1	29.2	21.8	12.1	35.6
1967	1,710	471	112	28.5	17.9	23.7	10.7	34.6	24.1	13.2	47.3
1968	2,321	539	118	22.9	11.0	18.4	9.3	35.0	33.1	23.5	46.6
1969	3,110	589	116	16.6	9.5	15.5	1.7	30.7	4.3	37.2	84.5
1970	2,899	603	125	13.0	6.4	14.0	3.2	42.6	12.8	30.4	77.6
1971	4,694	512	120	12.4	8.3	13.5	4.2	32.5	17.5	41.6	70.0
2015	157,482	1,255	396		1.0		8.0		4.0	46.0	87.0

Source: Various IIMA annual reports and internal reports in the IIMA Archives.

In 1966, the Admissions Committee revised the candidate evaluation procedure by assigning points for quantitative and verbal tests, interview, case discussion and screening of applications and ranked the candidates on a 'consolidated rating scale.'[19] The tests and interviews were conducted from mid-April to mid-May. Outreach activities were undertaken to increase the number of applications, and these included approaching engineering colleges. This pushed up the share of engineers among applicants to IIMA from two per cent to twelve per cent in 1966. The change in testing procedure began to favor engineering students as the SCAT scores now commanded greater importance in the selection process. The share of engineers in the student body entering the institute in July 1966 shot up to over thirty per cent. Consequently, the share of students from the Arts and Sciences fell in relative terms.

In 1967, the share of engineering students rose to 47 per cent with nearly the same share of applicants as the previous year. In 1968 the share of engineering applicants rose to 23 per cent and in 1969 and the years after, to over thirty per cent. There were two important reasons for this critical shift in applications. First, IIMA made a 'concerted effort' to approach the IITs and other engineering colleges of India.[20] While the sources are unclear on the exact reason behind this effort, it is likely that the IIT brand name was slowly establishing itself in India in the 1960s (King 1970b). Further, an important IIMA faculty member was an alumnus of the IIT system. Between 1966 and 1968, the Chairman of the IIMA Postgraduate Programme was B. K. Hegde, who did his M. Tech at IIT Kharagpur in 1956 and B. Tech in 1954 at an engineering college in Coimbatore in south India.[21] From 1969 to 1974, the Chairman of IIMA's Board of Governors was a distinguished industrialist, S. L. Kirloskar, who was a MIT-trained engineer (Bassett 2016). It is possible that these individuals advocated the need to approach the IITs for student selection. As noted earlier, the marketing efforts were more concentrated in Bombay, Calcutta and Madras where IIT's had already been established within the city or nearby. In fact, the IIT itself was a testing center in Madras leading to greater visibility of IIMA's admission process among its engineering students. As per one former IIT Madras engineering student who was part of IIMA's 1968–70 student batch, he filled in the application form to IIMA on account of peer observation.[22] More than ten per cent of that IIMA's batch came from IIT Madras alone.

The second reason for shift in application toward engineers was the industrial recession (1968–70), which led to more engineering students looking for nonstandard options in the face of unemployment.[23] In February 1968 itself, the *Times of India*, a leading English newspaper ran an article titled 'Jobless Engineers' who were 'hit by the recession' (Anon 1968). The article noted that there were 26,000 engineers without jobs and that the government had decided not to open new engineering colleges or technical institutes. By August 1970, it was reported that 65,000 engineers were jobless and admissions to engineering colleges had fallen by around thirty per cent (Anon 1970). The situation was so dire that the number of candidates sitting for the IIT Joint Entrance Examination began to fall progressively each year from around 35,000 in 1966 to around 13,000 students in 1970 as the attraction of engineering waned (King 1970a, 1464). The connection between engineering joblessness and increase in applications at IIMA is also confirmed from the oral history interview of Dwijendra Tripathi, faculty of business history and IIMA Postgraduate Programme (PGP) Chairman between 1968 and 1972. According to him, admission criteria had to be altered in this period otherwise all the students would

have been engineers, since engineers tended to perform well in the entrance examination.[24] In 1969 and 1970, 84 per cent and 77 per cent of the student body were engineers respectively while they formed around a third of the applicant pool.

This issue was commented upon in the meetings of the Board of Governors of IIMA, mostly comprising of Indian industrialists, who wanted a better mix of students.[25] And, in the faculty meeting of September 1970, the Chairman of the Admissions Committee commented on the increasing trend of engineers being admitted into the programme.[26] He noted that 'engineering and science students performed better in practically all the criteria for selection.' A former IIMA faculty member recounted this issue as the following: 'In the admissions committee, I think, you were very much aware of the expectation of how to keep the engineering students down. And also increasing the gender diversity. And so the humanities people would be supported more, but the thing was the engineering students from IITs were better in all aspects, you couldn't keep them out, without practicing actual discrimination.'[27] The comment on gender diversity is pertinent because Indian engineering institutes had very few female students in the 1960s.

Despite the praise for engineering students at IIMA noted above, the engineers themselves were not necessarily drawn from the top-performing cohorts of the engineering colleges in the late 1960s. Narayana Murthy, who would co-found the iconic software firm Infosys in 1981, and a researcher at IIMA's computer center between 1969–71 observed the following: 'I completed my engineering degree in 1967. The guys from my engineering batch who went to IIMs were average fellows. IIMs were not known well during those days. My batchmates were somewhere in the middle of the academic hierarchy. However, the top-ranking students of that era went to IISc [Indian Institute of Science] and IITs [for their Masters']. At IIT Kanpur, we were naïve to think that technology was the end-all in life. Therefore, there was a certain amount of unjustified contempt for management schools and for MBAs during the late 60s.'[28]

Some idea about the aspirations of IIT students is available from a survey-based study conducted in 1969–70 (King 1970b). First, the study showed that students chose an engineering career for several reasons: job opportunities, interest in engineering, limited knowledge about other careers, status enjoyed by the engineering profession, peer pressure, financial rewards, parental and kin influences, advice received at school, negative image of other disciplines, marriage prospects and the IIT brand value (King 1970b, 1500). Second, the study found that over half the students aspired for a postgraduate education and over three-fourths of them aspired to study abroad (King 1970b, 1509). It is instructive that this study did not mention IIM's as a destination for studies. Collectively, this suggests that engineers applied to IIMs in the late 1960s, more out of desperation or peer pressure rather than aspiration. Thus, a combination of increased applications led by IIMA outreach activities and an industrial recession, and better preparation to take the tests, changed the profile of the student body of IIMA to one dominated by engineers, and far from the ideal laid down by the Robbins report of 1959 and the first Admissions Committee.

Because of the surge in the number of applications, in 1970, the selection process changed from one-round to two-rounds of tests. It involved calling all eligible candidates for English and Mathematics written tests in one of nineteen centers in end-January 1970. Cutoff points were marked on SCAT scores, English test scores and previous academic performance and only those candidates satisfying all three cutoffs were shortlisted for the group discussion and interview, regardless of their cumulative score. Such a system

favored the engineering students, not the least because they were used to giving similar tests before in the admission process of engineering colleges. As one recent study has argued, the low probability of clearing the entrance exam to the IITs means that those who do so tend to be confident and show superior performance later on in their careers (Chakravarty and Hegde 2019). There is also an argument that there is some level of pre-college sorting which matters as students with good academic performance tend to choose engineering over other disciplines because of parental and peer pressure and the perceived successes of what Ross Bassett calls the 'technological Indians' (Bassett 2016). The engineering students had better academic grades in college than students from liberal arts and commerce backgrounds and had a relatively easier route to satisfying all three cutoffs. A second round of interviews and group discussion tests were held where weight was also given to extra-curricular activities and work experience, but unlike in the past, the shortlisted candidates were mainly engineers because they were better placed to clear the first round.

The engineering students who graduated from IIMA tended to receive higher salaries than students from non-engineering backgrounds (Wadhva and Garg 1976). It was not that the job requirements necessarily valued engineering skills in particular. Between 1967 and 1974, the percentage of students placed in Marketing jobs ranged from 39 to 51 per cent (Wadhva and Garg 1976, 11) implying that a substantial proportion of engineers, who came to dominate the study body, chose marketing careers. Recruiters were potentially placing a premium on the technological manager on the basis of their educational backgrounds that signaled quality rather than the actual nature of job skills required.

Over the next four decades, the average share of engineers in the student body at IIMA stood at over 75 per cent, with a significant fraction coming from the IITs. Engineering dominance at IIMA did briefly attract attention in the 1970s and 80s. A meeting of the IIMA Board of Governors in 1979 noted the rise of IIT engineers in the IIM system and argued that 'the institute should aim at developing managers with different disciplinary backgrounds.'[29] Similarly, V. S. Vyas, a former Director of IIMA between 1978 and 1982, recollected his disapproval over engineering dominance (IIMA 1994, 15). But these concerns appeared to reduce over time.

Discussion and conclusion

Ross Bassett outlines how the idea of the 'technological Indian' was shaped primarily through US-India connections and collaborations in the twentieth century (Bassett 2016). After Independence, engineering evolved into an aspirational degree that could contribute to nation building outside traditional aspirations in the civil services (King 1970b, Bassett 2016). Between 1926 and 1973, nineteen children of Indian business families obtained Bachelor's degrees at MIT (Bassett 2016, 222). This list included the Lalbhai's and the Kirloskar's both of whom held important leadership positions at IIMA in the 1960s and 1970. The faculty of IIMA itself began to draw people with engineering backgrounds, often from the IITs. Thus, despite the stated objective of bringing about diversity in educational backgrounds, important decision makers associated with IIMA, reflected middle class views of holding the engineering degree in great esteem. It was within this context that IIMA began its outreach programme toward engineering colleges in the mid-1960s, going so far as to holding its entrance examination on the IIT campus itself.

Along with increased outreach, the surge in applications between 1966 and 1970 from engineering students would not have taken place without the macroeconomic context of an unfolding industrial recession. These two factors, along with a change in admission criteria that led to more isomorphism with IIT's entrance examination, tilted the balance in favor of engineering students. Throughout this saga, critical voices emerged questioning the dominance of engineers. These concerns were, however, allayed by the screening feasibility that emerged with increasing number of applications and an idea of meritocracy that only those who could clear the entrance tests were worthy of entering the management institute.

While reviewing the developments at IIMA over its first decade, the official report observed that IIMA had pursued a 'policy of selective admission instead of selective graduation', where 'no preference was given to any particular academic background' and where the 'search for merit is the basic prop of the selection process' (IIMA 1973, 18). Merit, by 1970, however had a clear bias toward excellence in quantitative techniques, through the time-bound testing procedure that favored engineering students. This view of merit in higher education is somewhat different from that expressed by Ajantha Subramanian in her anthropological study of IIT-Madras where she argues that meritocracy was closely linked with caste affiliation (Subramanian 2019). As per that argument, the IIT system appeared to create an aura of merit, especially in its early days when affirmative action programmes were not in place, because of the relatively easy access of upper-caste Indians to enter the institution using social and caste capital. Evidence on such a caste-based meritocratic view at IIMA is limited for the 1960s, perhaps attributable to the religious diversity among key institutional builders. By the late 1960s, meritocratic norms at IIMA were closely aligned with the ability to pass the admissions test, which had by then started to favor engineers.

The experience of IIMA closely mirrors that of the other IIMs. At IIM-Calcutta, the other IIM established in 1961, the share of students from the IITs exceeded 70% by the late 1970s (IIMC 2012, 67). Having an IIT-IIM degree became in many ways the gold standard of higher education in India and the aspirational ideal of the technological manager had been established. A new IIM was set up in Bangalore in 1973 and then several more were set up to take the tally up to 20 IIMs across India in 2018. In the IIM system, engineers have accounted for over eighty per cent of the student body for several decades since the 1970s.[30] In leading private business schools of India, the figure is close to seventy per cent. In contrast, at the Harvard Business School for instance, the share of science and engineering students hovered at around a third of the student body over several decades.[31] The persistence of the phenomenon in India also differs from the experience of Norway, a country where this phenomenon has been studied and where engineering dominance reduced over time (Kvålshaugen and Amdam 2014).

Why should engineering dominance matter in the world of the Indian managerial elite? There are at least two reasons why engineering dominance could, in fact, be a matter of concern. First, classroom discussions and later on, managerial perspectives in top management are seriously constrained by an engineering-only world view. A related view suggests that an exposure to the liberal arts is vital to succeed in the digital age (Hartley 2017). Engineering dominance has also potentially crowded out interest from other disciplines in management education due to the strong informational networks established between engineering colleges and management institutes through alumni networks and more

recently, internships. In this, the IIT-IIM network has been particularly strong in creating important demonstration effects and pathways for information to flow through.

More pertinently, the lack of diversity in educational backgrounds has had a direct fallout on the lack of gender diversity in Indian management schools where after five decades, the share of female students in the intake was lower than twenty per cent on average in the first two decades of the 21st century.[32] On gender diversity, the three IIMs that feature in the Financial Times Masters in Management ranking of the Top 100 Business Schools are ranked in the 90s, that is, at the bottom end, when they perform well on other indicators. In contrast, at HBS, around forty per cent of the intake now comprises of women.[33] Since engineering colleges in India have traditionally had a skewed sex ratio favoring boys, the influx of engineers into the IIMs and from there to leading managerial roles, is also dominated by men.

It was only recently, that a serious reorganization of the selection procedure took place after detailed faculty deliberation to increase diversity in the student body of IIMA, especially on account of gender, which is now beginning to produce results. In 2017, the share of engineering students in the incoming batch at IIMA dropped to seventy per cent and the share of female students rose to an all-time high, close to thirty per cent. India's experience shows that specific contextual factors such as the macroeconomic environment and admission criteria at leading management schools have influenced the manner in which a specific type of technological manager has been created. The significance of the contextual factors suggests that engineering dominance in the IIMs was partly serendipitous and more importantly, that it can be reversed.

Notes

1. HBS Archives: Various Bulletins.
2. Author's analysis based on class profiles published on websites of various business schools.
3. Ford Foundation Archives. 1972. 'Oral History of Douglas Ensminger, B7- Management Education in India.' Rockefeller Center Archives, Tarrytown.
4. Websites of BMA and IISWBM respectively.
5. The oral history account mentions American Institute of Management but it is likely to refer to the American Management Association.
6. Ibid.
7. HBS Archives\IIMA Records\Box 8\Folder 7\MBA Survey, 1963, Table VII.
8. IIMA Archives\IIMA Academic Documents\Course Outlines\PGP Review Committee 1969–70, Briefing of Two-Year Post Graduate Programme in Business Administration.
9. IIMA Annual Report, 1964–64, p. 8.
10. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\FCM Minutes\Vol. 1, p. 46–48. One of these student candidates from the sciences, C K Prahalad, eventually became the batch gold medalist and later a world renowned management guru.
11. Ibid.
12. HBS Archives\IIMA Records\Box 1\Folder 5\Admissions Policies, 1962–63.
13. IIMA Archives\Oral History\Alok Chakrabarti\Oral History Transcript, p. 3.
14. IIMA Archives\Oral History\Dilnavaz Variava\Oral History Transcript, p. 5.
15. IIMA Annual Report, 1963–64, p. 8.
16. IIMA Annual Report, 1964–65, p. 8.
17. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\FCM Minutes\Vol. 1, p. 205.
18. HBS Archives\IIMA Records\Box 12\Folder 4\Mathematical Skill Profile, 1965.

19. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\FCM Minutes\Vol. 2, p. 105.
20. IIMA Annual Report, 1968–69, p. 21–22.
21. IIMA Annual Report, 1968–69, p. 78.
22. IIMA Archives\Oral History\Subhash Bhatnagar\Oral History Transcript.
23. While newspaper reports and oral history accounts label it as a recession, economic data is more mixed.
24. IIMA Archives\Oral History\Dwijendra Tripathi\Oral History Transcript, p. 13–14.
25. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\BoG Minutes\28[th] Meeting (20 September 1969), 30th Meeting (10 April 1970), 31st meeting (18 July 1970).
26. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\FCM Minutes\Vol. 2, p. 385.
27. IIMA Archives\Oral History\Sudhir Kakar\Oral History Transcript, p. 4.
28. IIMA Archives\Oral History\Narayana Murthy\Oral History Transcript, p. 17.
29. IIMA Archives\Administrative Documents\IIMA Minutes of Meetings\BoG Minutes\66[th] Meeting (12 February 1979).
30. Various annual reports of IIMs across India.
31. HBS Archives: Various HBS bulletins.
32. Various IIMA annual reports.
33. HBS Archives: Various Bulletins.

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No potential conflict of interest was reported by the author.

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