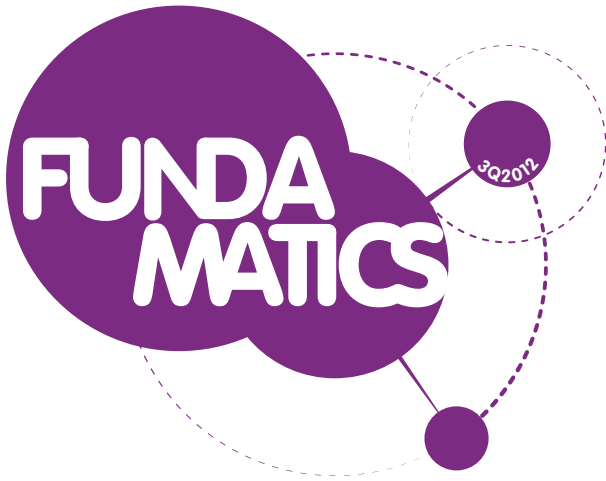


FUNDA MATICS

3Q2012







IIT BOMBAY ALUMNI
ASSOCIATION

Quarterly magazine of
IIT Bombay Alumni Association

Contents

From the Beehive	1
Readers Write in	3
Poll Khul Gayi	5
Poll-imerization of Poll-1 & Poll-2	6
Graph-It-I	7
Poll Star	9
To JEE or not to JEE? <i>Ali Baba</i>	12
Jee Huzoor	14
Archives for IIT Bombay <i>SP Sukhatme</i>	16
A Common Man's Account of an Uncommon Chief Minister <i>Humblebee</i>	19
Technological Breakthroughs in India's Knowledge Frontier <i>Stumblebee</i>	24
The Alchemy of Entrepreneurship	28
The Hagiwara Tandav <i>Srikrishna Karkare</i>	29
Reluctant Employees to Struggling Entrepreneurs <i>Gaurav Porwal & Sourav Panda</i>	32
Who Do You Think You Are, Steven Jobs? <i>Dr Rustom Kanga</i>	35
Sports Village Stories <i>Saumil Majmudar</i>	37
Is the Internet an avatar of the Spinning Wheel? <i>Sudheendra Kulkarni</i>	41
Atlas Shrugged <i>Jumblebee</i>	48
Reviving the New Stone Age	51
Handling employee compensation blues <i>Raj Aphale</i>	54
IITBAA Pune Chapter: <i>Milind Joshi & Gautam Naidu</i>	57
From High Places <i>Vasant Vasant Limaye</i>	60



Vikram aur Vetal	<i>Satish Agnihotri</i>	64
Reddy-made Cement	<i>Madhu Reddy</i>	68
Teesri Panama : 1982		71
Dhobi Offices And Dark Rooms	<i>Sailesh Kapadia</i>	72
The Humor Beings	<i>Nitin Gupta</i>	78
A “Swasth” model for Affordable Healthcare in India		80
Cashless Campus	<i>Poorna Chandra</i>	83
Butterfly Fields	<i>Sharat Chandra</i>	85
A Painter and a Poet		90
Starry Nights	<i>Hiro Chhatpar</i>	91
M&B		92
M&B v.1982		93
Placement Report from IIT Bombay: 2011-2012		99
The Pointless Pencil	<i>Crumblebee</i>	103
TREELABS	<i>Shirish Potnis</i>	106
The Great JEE Debate		109
India’s Education System: Doing a 360	<i>Kishor Kulkarni</i>	117
Information Systems Security	<i>Sunit Belapure</i>	120
‘Shor’ n’ Merry Mood in Goa		122
Prof. R. E. Bedford (1926 - 2012)		126
Thank You		128
Creative Bees at Fundamatics		130

From the Beehive

The third issue of Fundamatics is a landscape lovingly crafted: part discursive dialogue, part cynical satire and part anecdotal.

The magazine though young has already established itself as the vehicle of choice to voice alumni opinion. During the recent JEE controversy, IITBAA's statement to media as well as its deposition to the senate was based and backed by the results of the opinion poll (Poll Khul Gayi) conducted by us to elicit alumni opinion on this critical issue. Apart from the Poll results we have also attempted to deconstruct the JEE debate from a variety of viewpoints.

As a second theme for the issue we have presented first person, accounts from entrepreneurs that enjoy the felicity of humorous self deprecating narration. In the process they highlight the qualities of innovation, initiative, professionalism and integrity in a mixture which we hope you find both informative and inspirational.

While the magazine was being put together Grumblebee might have gotten grouchier and grouchier but as if to compensate for our dawdling, has contributed not one but two pieces of his very own brand of sarcasm. The humour quotient also gets a boost from the brilliant English translation of Vikram aur Vetral by Satish Agnihotri which was originally published in the 1980 issue of Pragati.

For a magazine editor, the cardinal rules of publication hanging right at the doorway is "thou shalt not be late." Year 1. Just two issues old and we have not only gone past that door but it has also fallen off its hinges!

There is little left to do but shrug our collective shoulders and go on as best as we can with humble apologies for our tardiness.

The German poet-philosopher, Friedrich Schiller had once written 'Late you come, but still you come.'

Fundamatics is late but here it is none the less.

Enjoy...

Queenbee





Readers Write in

ONE

Amazing effort in putting this together. Really enjoyed reading it and felt back on campus.

Great effort..keep it going.

Sanjeev Chhabra, B.Tech 1986-1990

TWO

THE FUNDA BEES

Bees produce honey in profusion
Whatever 'bee' their tribe or denomination
Poking into unheard of places
Stinging known and unknown faces

But the honey comes out all right
Thick and sticky and golden bright
Very sweet and aromatic to the taste
Not a single drop goes to indifferent waste

The honeybees of the FUNDAMATICS team
Buzz and beeline with fantastic vim
Scurrying here and there and everywhere
Moving into territories where others
wouldn't dare

Amazing is the world of the bee
Starting with lazy bee,
You have bumble bee
And you have stumble bee

Not to forget Queen Bee
And nosey bee
The humble bee
And the grumble bee

The funda bees are the toast of the hive

On submissions and deadlines they do thrive
FUNDAMATICS comes with awesome
packaging
To skittle through its pages is now the done
thing

Cheers to the B(ee) team
When we have this team
Who needs an A team ?
The B(ee) team is our A team!

Gautam Saha, B76, H3, Chem engg.



Write to us at
fundamatics@iitbombay.org

Poll Khul Gayi

Poll Khul Gayi (PKG) is an institution today. It had started off as a feature with an appeal to people: “Do not restrain yourself from expressing your opinion, lest your cynicism be misconstrued as indifference. Having our voice heard and making our opinion count can follow only when we have gathered quantifiable and verifiable data.”

The results of PKG-1 were enthusiastic and overwhelming and was hungrily lapped up by national dailies, who front-paged it and full-paged it to our pleasant surprise.

Branded and looked forward to, PKG is a mammoth exercise that works with an assembly line operation of our web teamers, marketers on social networking groups like Facebook, LinkedIn, Yahooogroups etc., office staff, poll analysts and a dedicated team of volunteers. Though the number of respondents totaling around 2,000 seems like a small number considering our 37,000+ strong alumni network and a 5000+ strong student population, our participation levels are much higher compared with other surveys conducted by other IITs. This reaffirms our belief that our database, outreach and volunteer commitment is much higher than that of other IITs.

We had started designing PKG-2 around the topic of entrepreneurship, which is the theme of our current issue. But the JEE reforms

announcement by the MHRD was a major step that needed to be surveyed and so we quickly re-designed our poll, even at the cost of delaying the issue release by a few days. Half way through the poll, a compromise seemed to have been struck and there were a lot of flip-flops and rollbacks. Surprisingly, and thankfully, this did not impair our poll in anyway. People trooped in to our website and continued to express their opinions with resolute determination. The system was meddled with. Even if the MHRD undid the meddling, an opinion had to be expressed, and expressed strongly. Just as one cannot un-slap anyone, one cannot un-meddle satisfactorily. When Prof. SP Sukhatme was de-mitting office as the Director of IITB, some journalists had asked him to recount his most memorable moments at IITB. Prof Sukhatme had replied, “During my entire five year stint as a Director, I did not get a single call for admissions.” This statement sums up the popular view about the JEE. That it is tamper-proof and the most credible system in India today. Possibilities that this may be broken have engineered a national debate and as before, PKG-2 has stepped forward to seek and analyze data that can be considered as properly quantifiable and measurable.

Voices expressed in PKG-1 were amplified and heard in the national media. Results of PKG-2 will go one step further and will be presented to the Senate and may also result in drafting of firm resolutions by alumni bodies. As before, PKG results are brought to you in the form of graphs and some pertinent comments in our Graphitti section, followed by an analysis in our Poll Star section.

Fundabees

Poll-imerization of Poll-1 and Poll-2

Question: Why are we at Fundamatics proud of IITB?

Answer: Our entire community of alumni, students and faculty participates whole-heartedly in surveys that touch upon subjects close to our heart.

The first edition of Poll Khul Gayi conducted in February 2012 asked for opinions on 10 crucial questions related to IITs and the participation from 1824 respondents was heart-warming. In our second edition, results of which we bring to you here, a turnout of 1765 votes has reaffirmed our belief that our community at IITB is far more enthusiastic than all other IITs, which have conducted similar polls but not been able to enlist more than 1000 responses. National dailies like The Times of India, Indian Express and Hindustan Times carried features about the outcome of our poll -- and all these dailies and several others are eagerly awaiting the outcome of this poll.

What has changed from the last poll and what has not?

Then, we had 1096 students. Now, we have 719 including 46 from other IITs. The drop in numbers could be attributed to the fact that this is vacation time.

Then, we had 638 alumni. Now, we have 994, including 57 from other IITs.

Then, we had 67 faculty members. Now, we have a paltry 17.

Then, we had 23 "others". Now, it is 35.

What's more, web statistics of the Poll Khul Gayi webpage shows 4050 unique page views, implying thereby that we have over 2000 visitors who visited the polling booth, but did not vote.

To come back to our poll vault statistics, we had participation from 25 countries this time compared to the 20 countries last time. India, USA, Singapore, Canada, UK, Australia, Germany, UAE, Switzerland, Netherlands, Indonesia, Norway, Japan, Hong Kong, Taiwan, Belgium, Malaysia, France continued their participation. Bangladesh, Brazil, China, Ireland, Qatar, Tanzania, Kuwait joined the pollsters. Thailand and Brunei dropped out. USA participation dropped to 16% from 27% of total votes, while India's participation increased to 79% from 65% last year.

The average age of respondents has inched up to 29.52 years from 27.67 years, probably due to the drop in student participants and increase in alumni numbers. Yet, this marginal increase implies that there was high participation from younger alumni.

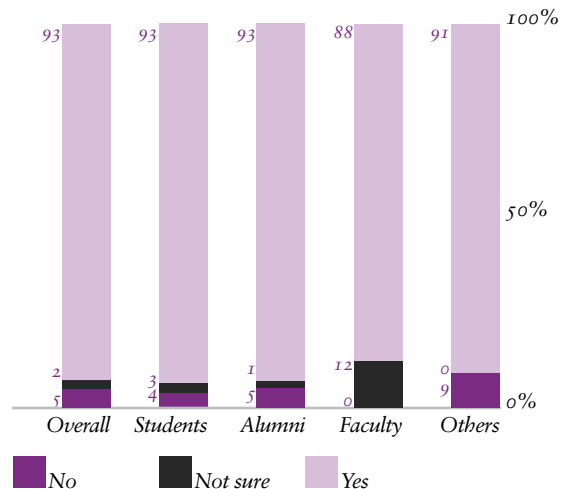
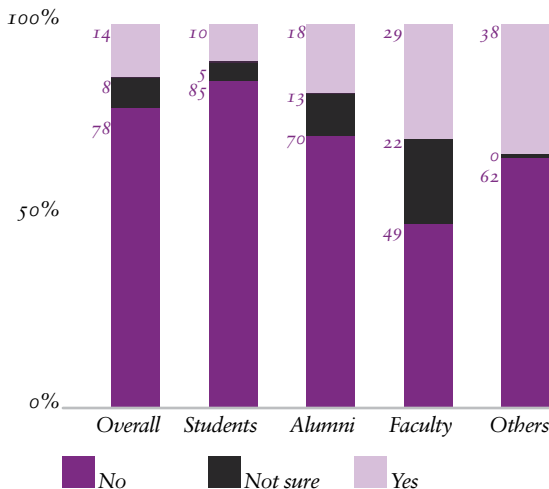
Peak polling was witnessed on June 13th, with 503 votes in a single day, followed by 433 votes on June 12th.

This time 387 persons commented using 17,172 words totally. Participants seemed especially concerned about the Government this time, with "Sibal" appearing 18 times in the comments, while "MHRD" appeared 30 times. ●

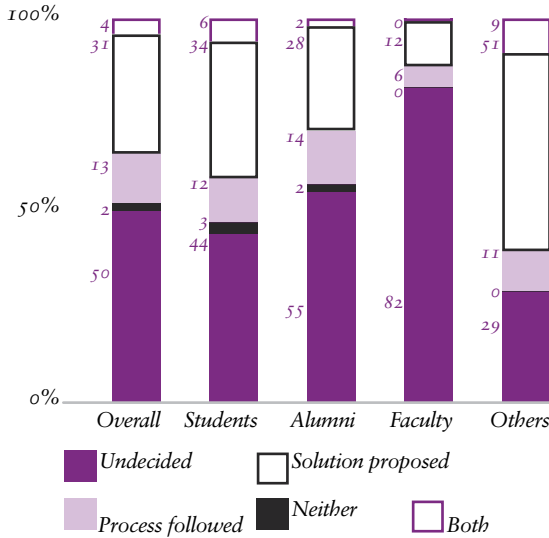
Graph-It-I

1. Do you support the decision of the Government of India to create a two tiered common entrance test as a reasonable compromise between the desires of MHRD and maintaining the meritocracy of IITs?

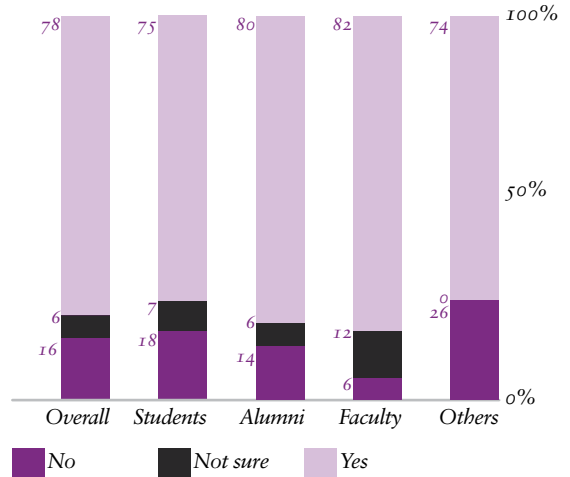
2. Any change in the admission process of IITs can only be done by a prescribed process, as laid down in the Institutes of Technology Act (Sections 15, 28 and 29) with the requirement of a resolution by the Senate of each IIT. The role granted to the IIT Council is supposed to be only advisory in nature, by section 33 (2) (a). Yet in this specific case the decision was taken despite dissenting views expressed by the various senates. Do you think that this kind of action by MHRD subverts the autonomy of IITs?



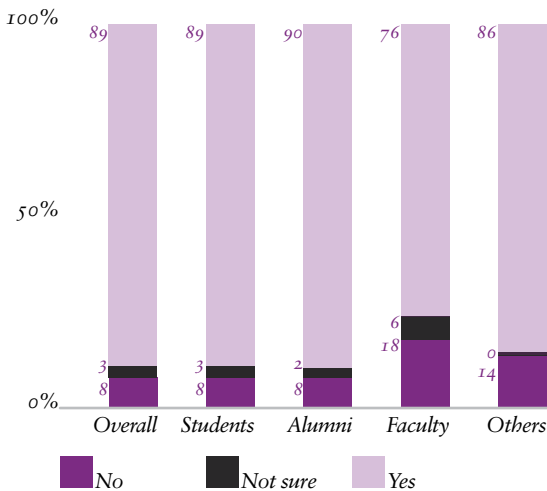
3. Do you have more of a problem with the solutions proposed (JEE changes) or with the process followed in getting there (bypassing the Senate, IIT act and statutes)?



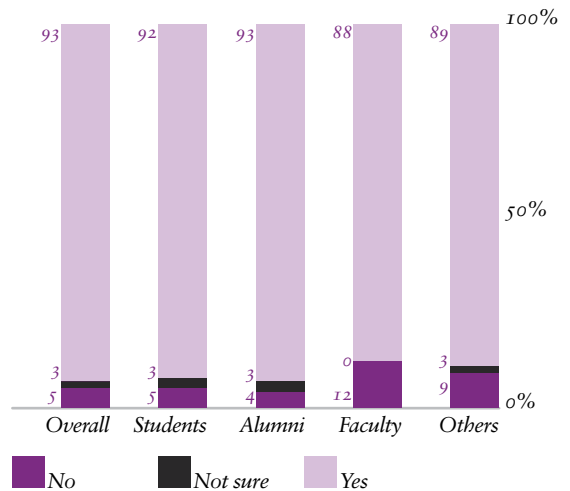
5. Do you think that IIT Bombay should also go the IIT Kanpur way and conduct its own examination?



4. Do you think that scrapping the current JEE format will eventually dilute brand IIT?



6. The control of the examination will no longer be solely with the IITs. Do you think this is the end of Brand JEE and that the exam will fall prey to the kind of scams and scandals that have dogged all other exams in the country?



POLL STAR

Showing the way

Poll Star is the analytical segment of Poll Khul Gayi. For readers who missed our April issue, this is what we had to say about Poll Star.

For navigators groping in the dark, the North Star aka Pole star shows the way. So also with us at the Online Survey team of FUNDAMATICS. The graphs told their own story, but we looked for our own Poll Star to show us the way out of this dark jungle of data. To help us traverse unknown paths and explore hidden meanings and nuances.

Fundabees

What the graphs say is obvious. And they say things loud and clear. And the graphs that you just saw say things very loud, and very clear! They shout a resounding 'NO!' to anything and everything that MHRD has proposed. Despite the flip-flops and rollbacks, and in the backdrop of a nationwide furore and revolts by senates, one message stands out: "Hands off! Don't mend something that is not broken and has worked well for 50 years. Don't dilute our standards. Don't equalize mediocrity? Don't meddle. Leave it to the experts." Can the Poll Star show us anything more? Is anything hidden from us? What more can we uncover in this seemingly near-unanimous vox populi?

Revelation 1: Just as in our earlier poll, we found the entire IITB community to be a

huge homogeneous mass. Just look at this table. What 435 respondents had to say on 12th June is what 1765 said upto 9th July with a marginal change in the percentages. Not only are the opinions overwhelmingly one-sided, they are consistent to the exact percentage over 26 days of polling. In the third question about whether respondents had a problem with the proposed changes or the process followed, people answered "Both" to the extent of 50%. But the rest had a problem with one or the other and if we add up the numbers of people who have a problem, we find that the final numbers add up to a whopping 94%.

Despite the flip-flops and rollbacks, and in the backdrop of a nationwide furore and revolts by senates, one message stands out: "Hands off! Don't mend something that is not broken and has worked well for 50 years. Don't dilute our standards. Don't equalize mediocrity? Don't meddle. Leave it to the experts.



Revelation 2: Now, we come to the uncanniest revelation. In our earlier poll that asked 10 general questions about IITs, our first one was, "Do you agree with the recent proposal to change the format of the JEE exam with a preliminary aptitude test and a 50%- 50% weightage to the entrance test and Board exam results?"

The answer: 78% said "No". 8% were "not sure". 14% said "Yes". And in this poll, our first question was, "Do you support the decision of the Government of India to cre-

UPTO	TOTAL VOTERS	PERCENTAGE WHO ANSWERED "No" TO Q1	PERCENTAGE WHO ANSWERED "Yes" TO Q2	PERCENTAGE WHO ANSWERED "BOTH" TO Q3	PERCENTAGE WHO ANSWERED "Yes" TO Q4	PERCENTAGE WHO ANSWERED "Yes" TO Q4	PERCENTAGE WHO ANSWERED "Yes" TO Q4
12-Jun	435	77%	94%	54%	82%	94%	89%
13-Jun	937	77%	94%	53%	81%	93%	90%
14-Jun	1047	77%	94%	52%	81%	93%	90%
15-Jun	1077	77%	94%	52%	80%	93%	90%
16-Jun	1102	77%	94%	53%	80%	93%	90%
17-Jun	1130	78%	94%	52%	80%	93%	90%
18-Jun	1183	78%	94%	52%	81%	93%	90%
19-Jun	1413	78%	94%	51%	79%	93%	89%
20-Jun	1594	78%	93%	50%	78%	93%	89%
21-Jun	1622	78%	93%	50%	78%	93%	89%
22-Jun	1644	78%	93%	50%	78%	93%	89%
23-Jun	1665	78%	93%	50%	78%	93%	89%
24-Jun	1683	78%	93%	50%	78%	93%	89%
25-Jun	1698	78%	93%	50%	78%	93%	89%
26-Jun	1728	78%	93%	50%	78%	93%	89%
27-Jun	1739	78%	93%	50%	78%	93%	89%
28-Jun	1743	78%	93%	50%	78%	93%	89%
29-Jun	1750	78%	93%	50%	78%	93%	89%
30-Jun	1756	78%	93%	50%	78%	93%	89%
02-Jul	1758	78%	93%	50%	78%	93%	89%
03-Jul	1759	78%	93%	50%	78%	93%	89%
04-Jul	1760	78%	93%	50%	78%	93%	89%
05-Jul	1762	78%	93%	50%	78%	93%	89%
07-Jul	1763	78%	93%	50%	78%	93%	89%
08-Jul	1764	78%	93%	50%	78%	93%	89%
09-Jul	1765	78%	93%	50%	78%	93%	89%

ate a two tiered common entrance test as a reasonable compromise between the desires of MHRD and maintaining the meritocracy of IITs?”. These questions were posed 4 months apart, in an unrelated manner and in different contexts altogether, triggered by announcements by MHRD. And the answer to this question is stunningly similar. 78% said “No”. 4% are “undecided”. 18% said “Yes”. And to top it all, the participants in the two polls are substantially different, with more alumni having come in from more countries. Yet, the answers remained the same. Does it prove the saying that “wise men think alike”?

Revelation 3: Maybe the pundits from the Maths department can correct us, but we believe that people who answered with all winning answers i.e. “no” for Q1, “both” for Q3 and “yes” for Q2, Q4, Q5 and Q6 should number $78\% \times 93\% \times 50\% \times 78\% \times 93\% \times 89\% = 23.6\%$. But with 606 people turning in all winning answers, percentage is 34.3%. This significant departure from theoretical probability suggests that our questions are “related” to one another. For instance, a person who says that he has a problem with both the proposal and process is not likely to say that autonomy of IITs is not being subverted. This brings us to the question. Are there any who voted with all losing answers? Yes, all 4 of them. 3 alumni and one student. By the same probability theory mentioned earlier, we should have had no respondents turning in all losing answers. (0.12%) Again, the higher than probable number re-enforces the theory that questions are related and a particular response to one question may entail a specific response to another question.

Revelation 4: This one is not so surprising. Compared to our earlier poll, the gap between faculty, alumni and students is barely perceptible. So also with gaps between

Compared to our earlier poll, the gap between faculty, alumni and students is barely perceptible. So also with gaps between India and US based alumni. And even with opinions amongst different age groups.



India and US based alumni. And even with opinions amongst different age groups. When opinions converge and alignments are measured in percentages that touch 90s, gaps between segments tend to vanish.

These results convince us that polls amongst IITians require a very small sample size. A survey amongst 200 IIT folks may establish the same outcome that would result from 20,000. We are also convinced that IITians will argue, contest, pontificate, theorize, debate endlessly, but will be consistent with their answers over a period of time. And above all, we are convinced that IITians will express themselves vehemently and quantify their opinion if the MHRD or anyone else embarks on any misadventure on an issue that is close to an IITian’s heart. ●

To JEE or not to JEE?

Ali Baba

It appears that Shakespeare provides us several options to choose from if we wish to give a name to the drama that is currently unfolding around us. Should we call it a *Midsummer Night's Dream*? Or *Taming of the Shrew*? Or finally, *All's Well That Ends Well*?

Indeed, it has all the ingredients of a Shakespearean play -- histrionics, impassioned pleas and wild accusations, brinkmanship,

With the increasing number of IIT aspirants, the task of conducting exams will become an even greater burden on the faculty, who see no value in this effort... The old model was not scalable and a change was needed. Sadly, the initiative had to come from outside rather than from the IITs themselves.



subtle double-speak, blatant self-interest disguised as greater good, and finally an appeal to the courts with a cry of *yeh shaadi nahi ho sakti!* There could yet be a shoot-out with a couple of corpses as well.

But, this is serious business and one needs to

keep the rhetoric out. This matter of making changes to the Joint Entrance Examination (JEE) raised several issues that are critical to the future of the IIT system itself. The foremost is Autonomy. We have been consoling ourselves for the past 50-odd years that while we may not have financial autonomy, we have always had academic autonomy. In the early days, when one had to explain to one's relatives that IIT was not the same as ITI, the babus in Delhi were quite content to leave IITs alone and let them frame the rules for running their business. But now that the IITs have become an international brand, the temptation to be part of it seems too much to resist. After all, they say, the tax payer is footing 95 percent of the cost of running IITs and hence the 'government' needs to exercise oversight. However, in these 50-odd years, IITs have never been accused of misusing funds, or admitting students for considerations other than merit, or leaking examination papers, or of not declaring results on time. Can the 'government' claim such a record? However, the reality cannot be wished away that until IITs can achieve some degree of financial autonomy, academic autonomy will always be at risk. Alumni can make a difference here, but that is not to say that the 'government' does not owe it to the nation to support the IITs if India is to achieve its potential in the knowledge economy.

If one were to take a legal view of what is happening, all decisions are being taken by the IIT Council of which the IIT Directors and BOG Chairpersons are members. The decision on changes to JEE was, we are told, taken unanimously, so where is the violation of our autonomy? In theory, we can have all the autonomy in the world, but so long as we do not choose to exercise it, we have only ourselves to blame. To be fair, two IIT Directors have publicly spoken in favour of the proposed changes, so there is still some spine

after all. Those who would like us to believe that they were against the proposal should say so publicly.

But do we really need a change? While it is fine to say, “don’t fix it if ain’t broken,” it can be no one’s case that the system is perfect. Eminent alumni have expressed views that things are not what they were as far as the quality of IIT students is concerned and every JEE Chairperson will recount how difficult it is to get faculty members to participate in JEE operations. With the increasing number of IIT aspirants, the task of conducting exams will become an even greater burden on the faculty, who see no value in this effort. They would rather spend their summers in cooler climes than go to Kota and conduct exams and then spend weeks evaluating the papers. The old model was not scalable, a change was needed. Sadly, the initiative had to come from outside rather than from the IITs themselves.

And what about the Coaching Classes? This is a red herring. No amount of tinkering with JEE will eliminate them so long as our schooling system is in the dire state it is in and the IITs represent the only option for a decent education at a cost the middle classes can afford. The Coaching Classes will continue to flourish, only now they will provide coaching for Board exams too. This brings us to the question of giving adequate weightage to school education. It is difficult to deny the importance of proficiency in subjects other than Chemistry/Physics/Maths in the making of an engineer. But the problem is that Board exams results are notoriously unreliable and no amount of statistical manipulation can eliminate the effects of cheating. However, the final filter must be the IITs themselves. It is commonly said that while it is very difficult to get into an IIT, it is not difficult to get out with a degree. This will have to change.

There is a silver lining to this drama. This is the first time that a decision of the IIT Council has been sent to the IIT Senates for their views. One can hope that in future such consultation will take place before rather than after a course of action is decided. The Alumni and IIT Faculty Federations have played an important and responsible role this time and deserve to be complimented. One does not recall such consultation when the four semester MTech went to three and back

It is commonly said that while it is very difficult to get into an IIT, it is not difficult to get out with a degree. This will have to change.



again to four or when the five year BTech went to four. Now IITs need to concentrate on the real challenges ahead, that of becoming the fountainhead of technology and innovation. One hopes it is not the call of the night-blind watchman from the movie inspired by IITs but truly a sign of change. ●



*Prof. Aliasgar
Qutub
Contractor*

JEE HUZOOR



GE. No, we are not talking about girlfriends. We are talking about a “grumbling festival” that was unleashed after the announcement of the controversial JEE reforms. Grumblers came in from everywhere, from classrooms to boardrooms. The sophisticated grumbled in English and legalese. The rest grumbled in 4 lettered words. But grumble they all did. They all infringed on the vocation of our resident Grumblebee, who was rendered jobless during our last issue. But thanks to a diktat that emanated from Delhi’s Shastri Bhavan, Grumblebee’s rusty keyboard now had a mission. A mission to vent and fume and grumble. In this piece, Grumblebee vents away, while remaining smart enough to camouflage names, camouflage the narrative as a fairy-tale and above all, to camouflage his identity.

Grumblebee

Once upon a time, there was a huge estate controlled by one family. The Estate was known as MGPL-short for Madam G’s Pvt. Ltd.; named after the current head of the family. The Caretaker of the Estate (COE) was a simple man with a simple blue turban who never spoke ill of anybody. That’s because he hardly ever spoke and only nodded every time Madam G spoke. He also volunteered to be implanted with an elec-

tronic device that allowed him to be remote controlled by Madam G, from wherever she chooses.

But the other staff members of the Estate were a frisky lot. For instance, there was a Shudder Jowar who was in charge of cultivation of the Estate and he aspired to be the COE. But he spent too much time playing cricket and rather than growing Jowar, he measured the fields and planned on constructing concrete jungles on them and was hence out of favour with Madam G.

Then, there was a P. Chillum Humdrum who was formerly, the Chief Financial Officer (CFO) of the Estate. After he managed to successfully bungle the accounts big time, he was promoted as the Chief Security Officer (CSO) of the Estate. He was brought in because he had it in him to hit a “home” run, but instead, he managed to spend more time scoring self-goals.

And there was this Prefab Musterjee who came in as the CFO after P. Chillum Humdrum. Musterjee managed to pre-fabricate muster rolls and bungle the accounts and finances of the Estate even more than his worthy predecessor and for this act of mucking up things he was rewarded with a huge promotion. He, with his beaming smile that earned him the nick of Mr. Pepsodent, was moved to a sprawling mansion in the Estate, from where he would sign on dotted lines and make liberal use of his new found toy, a rubber stamp and its readily inked pad.

And let us not forget the PT instructor S Calorie-muddy who bought hockey sticks at the cost of gold sticks and converted the Estates commonwealth into his personal wealth.

A Roger was a telephone operator of the Estate who drew some Spectrum Graphs in 2D. For some reason, this caused a huge loss that the accountants could not evaluate, since

no one had learnt to count up to that much. As a reward, he and some of his cronies were rewarded with an all expense paid stay at the Tahir Hilton hotel on the Estate. After a brief stay at the Tahir Hilton, these guys were welcomed back to bungle some more and await their next promotion.

One of the members of this staff was Jari Rummage and he was in charge of keeping the gardens and the pool clean. He did not know how to bungle this seemingly easy task and hence, in order to join the brigade of the bunglers, he decided to look at the electric sub-stations on the Estate and declare that these were not world-class. This remark got him the attention that he wanted.

And this incident brings us to the hero of our story-Uphill Cymbal. It was an uphill task to talk to him without getting interrupted because he always beat his own cymbal drum at the drop of a drumstick. Cymbal was the Estate's attorney who had figured that bungling would win him just rewards and taking a cue from Jari, he decided to target the electric sub-stations on the Estate which were running flawlessly for over 50 years now. Cymbal also had another fetish. He wanted everyone to address him as JEE Huzoor. Now Cymbal was a HaRD nut to crack and he always wanted to be HearD and not hear anyone, not even the guys who were manning the stations. "One Station, One Quest". That was Cymbal's new mantra for all the stations on the Estate. He wanted to be the Sole Questor who would InQuest all the Station Heads into listening to his cacophonous rendition of his cymbal drums.

Now these efficient Station Heads were running their operations smoothly and generating sufficient high quality power without any JEE Huzoor to report to. Cymbal wanted to change things. First, he ordered the commissioning of many more Stations in all corners

of the Estate. He then insisted that all power cables should flow through a "Board". He did not understand the concept of MCBs and insisted that all wires should be routed through a Board that led to the "Mains". ITI trained electricians would check the Board and the Mains and if they were satisfied, they could let the Station Masters do the "Advanced" Questing that would lead to power generation. Few realized that Cymbal had a hidden agenda. The Stations were generating power because they used some smart transformers manufactured in Kota. Cymbal did not like Kota. He only believed in Quota. So, to break the stranglehold of Kota made transformers, he brought in Quota controlled Boards and Mains that would bleed Kota and make his Chandni Chowk shine like silver.

Needless to add, this move by Uphill Cymbal did not go well with the Station Honchos. They met and decided that the quality of their power should not be tempered down by power mongers. They all went to the COE who continued to remain silent and nod his head. Two Station Heads protested and threatened to cut Power and break away from the Estate. Realizing that this would diminish his Power, Cymbal mellowed a bit, but only a wee bit. He continued to beat his drum into a loud cacophony. While the hapless Station Honchos mulled over the next steps, a wise man offered them this advice: "Do not do anything. Cymbal is trying to bungle up and he has succeeded. He is bound to be rewarded by Madam G and moved somewhere else. Someone else will come in and it will take a while before he starts to bungle. Be patient and wait. After all, you want to march to the tune of a different drummer, right?"

Should the Station Heads take this advice? Yes, they should. Why? Because this is a Fairy Tale and Fairy Tales end with, "everyone lived happily ever after." ●

Archives for IIT Bombay

S P Sukhatme

Padmashri, Prof S P Sukhatme has had numerous awards and accolades heaped upon him in his long and illustrious career as a Professor of Mechanical Engineering at IIT Bombay. He is known for his outstanding contributions both in teaching and research in the areas of Heat Transfer and Energy.

He has been a recipient of the Shanti Swarup Bhatnagar Award (1983), a Fellow of the Indian Academy of Sciences (1986) and a Fellow of the National Academy of Sciences (1999). He was also the Chairman of the Atomic Energy Regulatory Board for five years till 2005.

Described as the “Raymond’s Complete Man for Academia” in the IIT Bombay history book ‘Monastery, Sanctuary, Laboratory: 50 years of IIT Bombay’, Prof Sukhatme is an institution in himself. His 35 year long stint at IIT Bombay when he served the Institute first as the Deputy Director (1983-85) and then as the Director (1995-2000), has given him a deep and enduring understanding of the history and the inner workings of the Institute.

He has shared his recollections and reflections in a book ‘Four decades at IIT Bombay’ and such is the meticulousness of his recall that it forms a part of the ‘must have’ starting kit for every new faculty member who joins IIT Bombay. One of his enduring but

yet unrealised dreams have been to initiate an Archives which when built, will house a collection of documents, photographs and memorabilia relevant to understanding the history of IIT Bombay from its inception in 1958 to its present day.

Team Fundamatics is honoured and proud to share with you all an article from him where he speaks about this cherished dream and how alumni can help to make it a reality.

Bumblebee

About ten years ago, I wrote a short note to Prof Ashok Misra, then Director of IIT Bombay. The title of the note was ‘Footprints on the Sands of Time’ and in it, I proposed that IIT Bombay should undertake two projects. Project 1 was to write the history of IIT Bombay by 2008 when the Institute would be 50 years old; and Project 2 was to establish the archives of IIT Bombay. This is how the note began:

“An Institute should develop a sense of history as it grows in age. This history needs to be told and to be stored. A sense of history enables an Institute to understand the past, to reflect on it and to take pride in it. It also enables the Institute to look forward more purposefully to its future.”

I am glad that Project 1 was successfully executed. The Institute is proud of the beautiful book ‘Monastery, Sanctuary, Laboratory – 50 Years of IIT Bombay’ written by Prof Rohit Manchanda. It is one of the finest books of its kind. However, Project 2 still remains to be executed. In fact, not even a beginning has been made.

I did remind Prof Misra once or twice about Project 2 when he was the Director. He didn’t say “No,” but he didn’t take any positive steps either. Subsequently, I have pursued the matter with Prof Khakhar. He has said that



All well known universities in the world have archives where a wealth of information is available and is being used extensively for research. In IIT Bombay's case, it seems appropriate to suggest that steps need to be taken to establish the archives now.



he will take action. I am sure he will.

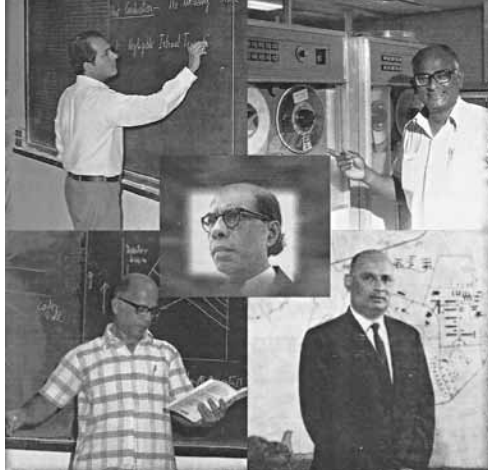
As an academic institution like IIT Bombay grows older, it is necessary to store material of historical interest connected with the growth, the development and the past activities of the Institute. Archives are set up with these goals in mind, and for the stored material to be available in the future for study and research. All well known universities in the world have archives where a wealth of information is available and is being used extensively for research. In the case of IIT Bombay, it seems appropriate to suggest that steps need to be taken to establish the archives now. The archives should also collect material about the people who have been part of the history of IIT Bombay. Such collections will provide us personal insights into the development of the Institute. In some

cases, the information could also help us better understand some of the current issues facing us.

As an example, let me take up the current issues regarding JEE. A study of all past documents and reports concerned with JEE stored in properly maintained archives would help us to understand how JEE has evolved gradually over the years. Who has taken decisions in the past? Has the nature and structure of the examination been determined by the IITs and their Senates or has the IIT Council taken the decision?

But let me come back to the purpose of this article. The goal of collecting material of archival value must be to support the IIT Bombay community in its teaching and research activities. At the same time, the Institute should encourage the use of the archives by researchers outside IITB.

The archives would be a store house for important documents and reports of the Institute, for example the agenda and minutes of the meetings of the Board of Governors, the Senate and other high level bodies. Publications of the Institute like Annual Reports, Courses of Study Bulletins, magazines, newsletters, etc would also be filed. In addition, the archives could also store audio visuals in the form of photographs, movies, video and audio cassettes, CDs etc of various events like the Foundation Day function, the Convocation, Institute Colloquia, the Alumni Get-together, Mood Indigo, etc. Some of this information is already available at different places within the Institute and will need to be collected in one place. A fair amount of such information may also be with persons who were connected with the Institute in the past and have now retired. Such information or material would need to be retrieved before it is permanently lost. It may also be desirable to record memories of faculty, staff and



Given the historical importance of such a project, it would be ideal if the archives are located in the oldest building in the academic area, viz. the TCS building.



alumni of events that they have attended.

Apart from collecting and storing the above information, the archives should have facilities for converting the reports, documentation, photographs, etc. into an appropriate form so that they are preserved for a long time. This is particularly important in a city like Mumbai with its warm and humid climate.

The space and staff requirements for the archives would not be excessively large. About 1500 sq m of area and a core staff of two or three should suffice. The space could probably be found in the Central Library where requirements for space for journals have reduced significantly in recent years. However, given the historical importance of such a project, it would be ideal if the archives are located in the oldest building in the academic area, viz. the TCS building. It is possible that the TCS building will gradually be demolished and the space utilized for constructing taller buildings. However, one or two wings would suffice for the archives. With proper rehabilitation and landscaping, these wings would create an ideal heritage atmosphere for locating the archives. In my view, the archives should have some space for an exhibition which would display some of its collections so that visitors to the campus can enjoy visiting it and get to know a little bit about the history of the Institute.

Apart from the requirements of space and

staff, the archives would need resources for buying and maintaining facilities and for continuous operation. The Institute may be able to provide a certain amount, but a fair amount would have to come from other sources. This implies that a corpus would need to be built with donations from alumni and well-wishers. The interest earned from the corpus would have to be used for providing the necessary facilities in the archives.

The purpose of this article is to state the case for establishing the archives in writing through the medium of Fundamatics. Do write to the Director or the Dean for Alumni Affairs if you support the idea. Better still; why not pledge a certain amount for the purpose as well! ●



*S P Sukhatme
Professor Emeritus,
Department
Of Mechanical
Engineering IIT
Bombay.*

A Common Man's Account of an Uncommon Chief Minister

Humblebee



This is a common man's account of an uncommon Chief Minister.

For an ordinary citizen like me, close encounters with a CM can happen only in reel life and pigs would fly on its proverbial wings before I could get an opportunity to study a real one in action. I had heard a lot about Chief Minister of Goa, Manohar Parrikar, from his IITB friends. Their fierce pride in their beloved 'Manu' had made me quite curious. So when a chance came about to trail in his wake, quietly observing him from the sidelines, I grabbed it with both hands. I

managed a one-on-one interview, shamelessly dug for dope on him from his friends, all the while justifying my quite 'common' curiosity, by calling it a sociological exercise.

Much has been written about Manohar Parrikar's 'Common Man' qualities. Outlook, India Today, H4 Madhouse, the odd newspaper and even personal blogs have been replete with first person accounts of a CM who travels 'cattle class' unlike other politicians, waits in queues at airports undistinguishable from the hoi polloi with nary a protocol officer or security personnel. Here was a CM who did not balk at the prospect of hitching a ride on his aide's motorcycle; or for the sake of getting the job done, supervise a traffic snarl at a busy intersection during the Goa International Film Festival.

Lenses and Mirrors

Yet Manohar Parrikar is no semi celluloid 'Nayakan' catapulted to power, part brute force and part folkloric myth. All these reports remarkable as they are, in the Indian context where political power is associated with feudal, almost primordial authority, fail to encapsulate what is truly uncommon about him.

There is nothing common about the qualities that make him successful as a Chief Minister, the first from an IIT to ever run a state gov-



ernment. And it is not his rootedness to his middle class upbringing but a brilliant and incisive mind that makes him so very capable for the challenges of the job.

Few know Manohar Parrikar as an entrepreneur or the fact that he is one of the foremost innovators in hydraulics from his state. He has been an entrepreneur for almost as long as he has been a politician. He began working in the realm of hydraulics as soon as he graduated out of IITB armed with a degree in Metallurgical Engineering. First he worked with his uncle's family firm named RK Hydraulics but branched out soon afterwards to start his own. His company Goa Hydraulics started off as a small scale industry and remains so even today- not from any lack of ability but more due to the fact that it always came second in preference when compared to his political commitments.

The company runs with a motley staff of maybe 20 personnel who have stayed loyal and steadfast for over 15 years and endured a proprietor who once visited them everyday, but now calls on them once a fortnight to check up on things. In his interview, he himself mentioned an occasion where on the very day he was to be sworn in as the CM (first term) he was expected to be in a different city signing a large repeat contract that

his company had won by virtue of a unique product innovation that he himself had come up with. He had to eventually pass on the opportunity because the company management was insistent on his personal attendance as proof positive that he had time to spare for his own company's projects.

His heady days as an early entrepreneur were the days when he installed hydraulic cranes on the trucks in Goa, followed by patronage from SAIL who wanted to reward him for his innovative spirit by placing some orders with his company. But it was only with a World Bank aided project that delivered some garbage lifting trucks to Goa that failed....failed with trucks whose mechanism refused to lift garbage, and challenge all experts who tried in vain to repair it.....did our intrepid entrepreneur step in to repair trucks, mechanisms and some prestige. In recent years he has also set up a second manufacturing unit of high tech orthopedic products that are almost 100% dedicated for the export market.

The biggest challenge For him however has always been about "how to keep my company separate from political influence. During my first term I used to get flooded with phone calls and this time around it is my son who has been receiving them. It became a nuisance till the point when I advised him

to tell everyone that my father and I do not discuss politics at the breakfast and dinner table and since those are the only two times that we meet in a day, there is no opportunity for me to know anything about his work with the Goa government”.

There is always a price to be paid when you wear two hats at the same time but in an era when politicians often use the privileges of their political office as a passport for self aggrandizement, Manohar Parrikar has gone to great lengths to ensure that at no point has there ever been any business transaction with anybody with even a remote connection to Goa. This has ensured that there were no local favours to be sought. His business might have suffered but the people of Goa did not.

Innovation and enterprise, coupled with this rare ingredient called integrity has actually been the hallmark of Manohar Parrikar way back from his student days. As a mess coordinator of H4 in 1977-78 and even as the G-Sec in 1978-79, he spent more time in the mess and less in lecture halls, taking inventory of all items and plugging leakages and pilferage. He went one step further and made several trips to the wholesale markets in Byculla to procure vegetables and other perishable food substances at lower rates. All this finally led to a substantial reduction in mess bills. Students of H4 then paid Rs. 160 per month while the rest paid in excess of Rs. 180 per month. It also helped H4 that Manu (as his hostel mates called him) was a strict disciplinarian who liberally fined students for the smallest breach and the H4 kitty swelled considerably with receipts from fine money. Any misuse of the telephone or an attempt at helping oneself to an extra meal (despite the quality of food) or an action of carrying a tea cup outside the mess was subjected to a hefty fine that started at a minimum Rs. 5 Manu special. And his integrity was on frequent

display when he fined himself for any act of misdemeanor by him or by his guests. Yes, he paid the same Rs. 5 when his guest plucked a rose from the H4 garden, knowing fully well that a rose cost a princely 50 paise in those days.

CEO at Work

Manohar Parrikar loves the concept of innovation and any out of the box thinking. His eyes light up and he smiles like a boy with a guilty secret when he tells me that “I am essentially an innovator and the only difference in what I am doing now is that instead of focusing on technological innovation my focus has shifted to innovation in governance”

Today, he brings the same skill sets to work as a Chief Minister. Make no mistake this is a CEO at work. CEO of Goa Hydraulics as a later day CEO of the Government of Goa who practiced the same spirit of entrepreneurship to augment Goa’s revenue by 40%. Entrepreneurship won again when Manu reduced petrol prices by a massive Rs. 11 per litre. People who had gifted away free power as an election sop protested that the CM was moving into populism and crafty electoral arithmetic. But Manohar Parrikar, with his proposed offsets and revenue recovery vide partial reduction of VAT on aviation fuel and other revenue generating schemes, knew better and knew precisely how to handle the economics with skills honed at the mess in H4.

He is also interested in innovative solutions for Goa from entrepreneurs who wish to do something different. He patiently sat through 21 such proposals from alumni entrepreneurs who met him on the sidelines of Goa Chapter’s Conclave. They might have been a bit fazed by the multi tasking machine that had one ear for them, the other one glued to the phone and kept barking out “fast.. fast” at

alarming regularity. Yet, when the questions came, they came at the staccato speed of machine gun bullets and displayed an alarming erudition on a wide variety of subjects down to its minutest detail. He also laid down the law right away, - 'don't give any kickbacks to anyone. Some people will be bold enough to ask you. Refuse. If you have a problem, let me know! I will set it right.' In short, he said that if you give a kickback, I'll kick your back. His honesty is an expensive commodity that cost him 7 years in the political wilderness and he was not about to sell it away cheap

When I grilled him about his scary memory later, I found out that he reads vertically and voraciously and is so much in love with the act of reading that he does not mind reading the most boring government files. The past seven years out of power were spent in full time research mode studying details of Govt schemes and noting the amendments needed to deliver them on the positive side. It helped, as he jokingly pointed out, that God had been kind enough to bless him with a brain that has a reasonably good (read 100 GB) memory disk and a pretty powerful RAM as well. Now he is a man on a mission to effect the changes he has quietly planned all this while waiting to come into power.

Those present at the IITBAA Chapters conclave at Goa were also witness to other innovative skill from him. How to juggle between personal and official cars while travelling in Goa in a combo of personal and official commitments. How to juggle SIM cards in his phone while making personal and official calls. Above all, how to manage simplicity and a lifestyle in a most simple manner that makes it look easy and very enterprising. Not to mention, innovative and integrated.

It is admirable that Manohar has not lost touch with his middle class roots but what is

perhaps even more remarkable is his stubborn refusal to use any of the special privileges of political office for himself or his family. I visited the Chief Minister's residence for my one-on-one interview and it was instantly obvious that this was not his residence and the entire place functioned only as a second office. Contrary to popular depiction, none of this stems from any son-of-the-soil common man like quality but a calculated decision on his part to keep himself detached from all the trappings of power that comes along with the CM's position. It is this detachment that allows him the freedom to ignore power's inherent self corrupting lure and forsake it when required for the sake of living by his principles and personal code of ethics.

His two decade long political career has been devoid of controversy and although I spent long hours digging hopelessly looking for some flaw to critique the only one I could find is his apparent impatience with mediocrity and a tendency not to mince his words. He said, "People say that I do not delegate work and tend to do everything myself. They are right. I only delegate when I am sure that the person I delegate to, will deliver. I believe the buck stops with me and I do not like to blame anyone else for any failure or inefficiency. And I have zero tolerance for inefficiency." It left me wondering is it possible for a person to do everything alone or should'nt his energies be better spent on pulling up an otherwise somnolent administration by its bootstraps? Contrarily enough, he is also known for his approachable style of work and although I might be wrong but my gut instinct would still characterize him essentially as a loner.

He came to power in Goa this year by practicing inclusive electoral politics and since the day he won, his aides told me that he has not taken a single day off. I did try to quiz



him about how sustainable was his punishing 20 hours a day 24X7 schedule while he tried to correct me by protesting with, “No, no I do not work 20 hour days . Only 18!” I hope the people of Goa will continue to see past the brusque exterior to a man who has personally contributed in making Goa one of India’s most prosperous provinces today.

I am a self confessed left liberal who sections of his party would love calling a ‘pseudo secularist’. But in the end I left Goa wondering why his party does not project him as their Prime Ministerial candidate. Fielding Manohar Parrikar as a Prime Ministerial candidate would reassure the common man that lineage and/or sycophancy are not necessary conditions for attaining high office and that merit and not identity politics can actually be the criterion for selecting someone in the

national leadership position.

If Manohar ran for Prime Minister, this common man would vote for him. ●



Technological Breakthroughs in India's Knowledge Frontier:

IIT Bombay's contributions

Stumblebee

The image of IITs in the public domain has assumed mythic proportions, be it the pre-eminence of its B Tech programme, the incorruptibility of JEE or the world famous alumni. The converse side of this IIT mythology, however, is the curious paradox of their characterization as ivory tower institutions where the halo of excellence is not driven by the quality of its content (research) and its relevance in the national context.

The purpose of this report is to go beyond such normative characterizations and to share the story of three specific programmes -- training 10,000 teachers at a time, the launch of Aakash tablet or the E-Yantra initiative -- to highlight that there is indeed a concerted effort within IIT Bombay to interpret socio-economic needs/problems within the country and then come up with solutions.

Train the Teachers: Take for instance the fact that engineering education in India is an arena of perpetual scarcity where demand for a quality degree far outstrips supply. One solution to narrow the gap and improve the quality of engineering education imparted in India is to improve the quality of teachers in engineering colleges outside IIT. Improve the teachers and you automatically improve the quality of the education and ultimately the quality of the end user -- the student.

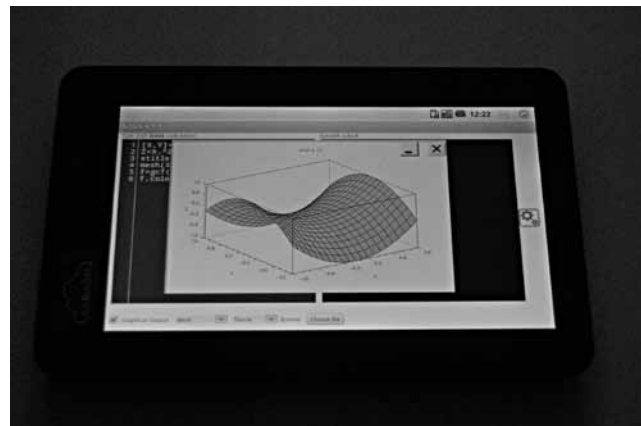
IIT Bombay has been collaborating with the Government of India through the National

Mission on Education through ICT to make their vision of empowerment through education a reality. As a matter of fact it is little reported that IIT Bombay has been quietly training and conducting workshops for empowering teachers who teach engineering courses across the country on basic courses such as electronics, thermodynamics, computer programming, etc.

A novel model was evolved in which as many as **1000 teachers** at a time participated in the workshops from designated remote centers. Not only that, through this programme, IIT Bombay and its faculty have already conducted more than **10 successful workshops benefiting 11,000 teachers across the country**. The feedback from participating teachers was also excellent and it encouraged the Institute to further scale up its efforts.

Today the model has been expanded so that as many as 10,000 teachers can participate in these workshops at a single point in time. For the first workshop conducted recently, more than 12,000 teachers enrolled. Eventually the workshop could only accommodate 9,000 as only 168 remote centers could be identified. Steps have however been initiated to identify and increase the number of remote centers to 200 initially and then eventually 500.

How the model works: Certain numbers of established colleges are identified as Remote



Centres, where the participating teachers assemble in groups of 30 to 70. Lectures are transmitted live from IIT Bombay. An A-View system, developed by Amrita University, is used for this transmission. It permits two way video interactions, making the lectures an almost live experience. Lab sessions and tutorials are conducted at each Remote Centre under the supervision of local Workshop Coordinators. These Coordinators themselves are expert-faculty at respective Centers, and for whom orientation programs have already been conducted at IIT Bombay.

Not only is this a phenomenal breakthrough in providing quality education but as Prof DB Phatak from the Computer Science Engineering department and the head of this project pointed out, this is “possibly the first ever attempt of its kind globally of simultaneously training engineering teachers in such a large unprecedented scale...our ultimate mission is to have a Centre in each town where there is an engineering college.”

Transform the Learning Experience of Students:

Connected closely to this collaboration between IIT Bombay and ICT and their common vision of empowerment through education is also the **launch of Aakash tablet,**

The long term vision at IITB is to continue collaborative research efforts and work continuously on Aakash-related R&D.



- a Low Cost Access-cum-Computing device, to serve as an affordable tool to enrich the learning experience of the students of the nation.

IIT Bombay was given the responsibility for running the first phase of the Aakash project three months ago. The Aakash Lab has been set up in the CSE department. In the short span of time since the project was transferred to IIT Bombay, it has managed to negotiate upgraded specifications with a faster 800 Mhz processor, a capacitive touch screen and an android based operating system. It has also escalated the battery power from 2000 mili ampere hour (approximately less than 2 hrs) to 3200 mili ampere hour (approximately 3 hrs). All this at a negotiated lower price of Rs. 2,263 per tablet, down from Rs 2,276 earlier.

The institute has been partnering Centre for Development of Advanced Computing (C-DAC) in this project and the plan is to con-



It is therefore not a question of whether we can afford to get into robotics but whether we can afford to keep out of this most important race in the future.



concentrate on developing educational applications and deploying the tablets in engineering colleges for field testing of devices. Hence, in the coming months IIT Bombay will be handing over 1 lakh upgraded tablets to students and teachers at engineering colleges across the nation. The 168 Remote Centre colleges that participated in the 'train the teachers programme' have also agreed to participate in this project and the deliveries of the tablets have already begun from July 2012. The immediate goal is to complete the deployment at over 500 engineering colleges.

Faculty and researchers at IIT Bombay are also focusing on developing useful Open Source applications and content for use on Aakash. These will encompass the entire educational spectrum from schools to colleges and from vocational training to professional studies. Content in Indian languages will receive special attention.

The institute received first 100 samples of the Aakash-2 device during May/June. It then deployed them to over 150 people, including faculty, Ph D scholars, M Tech students, and project engineers, to work on development and porting of applications and contents on the new device. Building upon the past work at IIT Bombay, the team made substantial progress, and the work continues in full swing. Already, key functionalities have been added and students can now use video lectures in an interactive fashion. They can access these from a local server using W-Fi. They can give online quizzes in the

class and can submit assignments. **They can conduct experiments and develop systems for engineering control applications.** The biggest breakthrough has been that Aakash can now provide a programming environment for users. Permitting students to write and run programs in **C, C++, Python.** The open source package 'Scilab' has also been successfully ported on Aakash. This effort emphasizes that unlike many other tablets, **Aakash is not just an access device anymore, but can be used also a regular computer for learning programming.**

The long term vision at IITB is to continue collaborative research efforts and work continuously on Aakash-related R&D. A number of hard research problems spanning multiple disciplines have already been identified. For the time being though the mandate is to empower teachers and students of engineering colleges. IIT Bombay's proposal for doing a pilot deployment for school teachers has been approved. It is likely to have a positive impact on the curious and the studious students from the under-privileged class of India and **the day is not far when Aakash becomes a ubiquitous tool in the hands of students, at all levels of their education.**

Finally early last month IITB also announced the launch of a pan India challenge on robotics with the vision that it will harness young intellectual talent to create utility-based robotic applications for usage across agriculture, manufacturing, defence, home, city maintenance and services industries.

What sets this initiative apart from others is its format. While other challenges expect students to build their own robots, E-Yantra presents them with a robot developed at IIT-Bombay, and encourages them to develop solutions to pre-set tasks using these robots. This makes robotics accessible to undergraduate students from engineering college studying a variety of disciplines such as computer science, information technology, electrical and electronics and mechanical engineering.

Hands-on learning infrastructure has traditionally been expensive in India. When students wished to do a robotics project, they had to first build a robot, and then work on the project, often faltering at the first hurdle. The resultant project was often a crude robot and little else. Now they will be provided with a robot developed by the IIT-Bombay team with an open source code base to draw upon and model a sophisticated solution to a problem.

The growth of embedded systems in India depends on our being able to produce high quality and innovative engineers with exposure to robotic technology from a young age. Prof. Krithi Ramamritham, co-coordinator of Project E-Yantra, IIT Bombay, said, “This proposal presents an integrated approach for incorporating robotics into secondary and engineering education with the objective of further engaging students through an exciting application of math, computers, and science”.

IIT Bombay’s Goal as described by Prof Kavi Arya Conceptualiser & Overall Coordinator (Principal Investigator), “India is at an interesting evolutionary moment in the global stage. We need to harness the youthful talent to solving our country’s problems through innovative applications in the field of robotics. For instance, why can’t we create a “Jhaddo-Khatka” robot, which can be

deployed across public and private spaces? An important part of this initiative is to encourage a practical outlook and inspire the youth to look beyond themselves and solve the problems of the nation by leveraging their innovative thinking”.

It is believed that due to the lower costs brought on by robotic manufacturing technology and the increasing cost of transportation, a lot of manufacturing sector jobs are going to migrate back to developed countries. It is therefore not a question of whether we can afford to get into robotics but whether we can afford to keep out of this most important race in the future.

We hope this report encourages the reader to participate and support IIT Bombay in its dream to ensure that a quality technical education is no longer the preserve of a few elite institutions but can be accessed by anyone with ability and interest. ●



The Alchemy of Entrepreneurship

All of you probably know a few IITB alumni from your batch or thereabouts who are successful entrepreneurs. As a not-so busy-bee, I have always been passively curious about 'enthu' 'junta' from IITB bitten by the entrepreneurship bug. When the Fundabees were casting around for a lead theme for this issue, my suggestion of picking entrepreneurship was accepted with alacrity. After all, no one can deny that this is an area which generates considerable interest among IITians.

This is an issue that celebrates the spirit of enterprise among our alumni. Not the million dollar success stories, - well narrated and commonly known. But, the numerous successful initiatives which in the last few decades have been an invisible but essential part of the engine that fueled India's growth economy.

Scattered across the pages of this issue are first person accounts from entrepreneurs with innovative ideas, business models and products in the creation stage; at the cusp of scripting their own big success story. We also picked on a few entrepreneurs who chose to tread into sectors as unengineer like as can be imagined. We also added truly inspirational entrepreneurial experiments from the realm of social entrepreneurship that further explore the interplay between social innovation and technology innovation particularly in the area of Education and healthcare.

The bees were well aware that as an alumni magazine ours is an audience that is already reading countless business magazines. Hence we have put together articles whose content, tone and voice are uniquely different from what you get in abundance. True to form I managed to get most of the actual writing and related work done by the hardworking entrepreneurs themselves. Now after all the flitting about, reading and cogitating, I return to my semi somnolent state while you go ahead and enjoy the rest of the accounts.

Zzzzzzzzzz

Lazybee



THE HAGIWARA TANDAV

When a Japanese Giant danced with an Indian SME

Srikrishna Karkare

I look at the mirror now, when I am 53 years old. Eighty percent white hair! Only to be expected at this age? Actually, it happened to me a long time ago, back in 1993 when I was only 34. That was when Hitachi stumbled upon Enpro, a company founded by Alka and I to design and manufacture packaged piping systems.

On a sleepy afternoon back then, I got a phone call from our friendly neighbors, Thermax. They say there is a team visiting them from Hitachi of Japan. They want to visit Enpro and wanted our permission to do so. It was a bolt from the sky! I bolted from my chair and got our team together. We had to put out best foot forward! Hasty house-keeping exercises were undertaken to create the semblance of a walkway in our cluttered shop.

A team of five Japanese, led by Mr. Y Hagiwara turn up at sharp 10:00 a.m., wearing immaculate black suits. After a few pleasantries (repeatedly bending at the hip at right angles, and exchanging business cards as though they were our most precious belongings), they very politely asked for permission to take photographs. Once granted, all five of them suddenly pulled out their cameras and went berserk through our tiny shop, capturing on celluloid every tiny detail in every nook and corner. (Remember, this was pre-digital age when cameras had film, drawings

were made by drafting machines, messages were sent on fax with thermal paper and one had to book STD calls to talk to other cities.) The photo session was followed by detailed personal interviews of everybody right from the Managing Director to the shop welders, and an audit of all functions.

This one day audit was followed by an enquiry, which we quoted with the same recklessness of a four year old child (after all, we were only four year old in the business and had practically no exposure to international business.) What followed was a whirlwind tour to audit all our sub-suppliers (8 cities in 4 days, six flights, 1,800 kms on road and three sleepless nights.) After this not-so-cursory due diligence, Mr. Hagiwara San was ready to talk business. After a lot of technical back-and-forth he offered a price and a delivery date and told us that the order would be ours if we agreed to both. We were really salivating at the prospect of getting our first international order and agreed almost instantly (again with the same ease as a four year old would agree to do an errand in exchange for a lolly pop.) No sooner had we shaken hands, Mr. Hagiwara pulled out a neat box file and handed it over to me: “Congratulations, Mistal Kalkale – This is your letter of intent!”

That box file (letter of intent) was destined to change the future of Enpro and the color of

my hair forever.

In the coming few weeks, we spent thousands of rupees and dozens of reels of thermal paper, sending drawings over the fax and receiving comments/approvals from Hitachi. Every time the fax machine rang and I saw a message from Hitachi, my heart would sink (here goes another thermal paper roll worth Rs. 800 and several hundred rupees added to the telephone bill!). Two months after shaking hands with us, Hagiwara San realized that things at Enpro were not going exactly as planned. Hagiwara San would be on the phone with me every single day, running through the minutest details of our order. “Mistal Kalkale you told me a lie!” he would shout on the phone (meaning you did not do what you said you will do.) If I told him that a part did not arrive because a truck broke down or a supplier could not be contacted as telephone lines were not working, he would simply fail to understand what were to us common facts of life.

After about a month of shouting (his) and cowering (mine) over the phone, Mr.Hagiwara decided to take things in his own hands. He packed his bags and landed up at Enpro with one of his sidekicks, Kudo, and a welding expert Mr. O Tanaka whose entire vocabulary in all foreign languages (including English!) was “Namaste!” besides a big smile (which, fortunately, is understood the same way in all languages).

But when Hagiwara San arrived, he had another universally understood expression on his face: a highly contemptuous and contorted frown. For the next two months he took virtual command of Enpro, questioning anything and everything he felt affected the execution of the Hitachi order.

Once, a worker was distributing pedhas to celebrate a new vehicle he had purchased,

“Mistal Kalkale, what is the wolkin time at Enplo?”
“8.00 am to 5.00pm Hagiwara san”! I replied meekly.
“All these people came to Enpro after 8.30? You must be fie (fire) them at once!!”



and offered one to Mr. Hagiwara. “Why Now!” he hissed with a contorted viscous face. “Is this eating time? Please go and work on Hitachi Order!”

One day he was about to attack me with his most viscous abuse for our daily ‘non performance,’ when his expression suddenly changed from extreme anger to extreme fear and almost started shivering with fear at the sight of something behind me. I turned around to see it was just a common house lizard lurking on the wall!

Another day, he started frothing at the mouth and almost burst with fury when he saw one of the much-awaited plates for his job being delivered to our shop on a bullock cart!

One day, I arrived at the factory at 9.00 am and found Mr. Hagiwara sitting at the gate on a chair with a notebook in his hands. He followed me into my office, brandishing the note book that had a list of names written in it.

“Mistal Kalkale, what is the wolkin time at Enplo?”

“8.00 am to 5.00pm Hagiwara san”! I replied meekly.

“All these people came to Enpro after 8.30? You must be fie (fire) them at once!!”

We started serving him tea in steel mugs after he broke a couple of china cups during one

of his fits of fury. We also adopted an open door policy so he did not have to kick the doors while entering or leaving cabins.

Whenever he introduced himself by name, many of our vernacular workers could not help laughing. This would infuriate him to no ends. No one dared to tell him that the name was so funny when said in Marathi.

The fits of fury continued nearly till we completed our first order six months later (against the scheduled four months.) We were already 200% over budget. We were also 200% sure that Hitachi had totally written us off.

But to our utter surprise, they placed another much larger order with Enpro, even before the first order was shipped. Alka went to Hitachi Japan to get trained on lube systems (and that is another story in itself.) We executed the second order well within schedule and the budget and to Hitachi's full satisfaction. This was the beginning of a relationship that then lasted and flourished for almost 20 years. It has also spawned new relationships

The six-month interaction with Mr. Hagiwara was indeed baptism by fire for the fledgling Enpro. Today, Enpro is one of the best known brands for lubrication systems globally.



with other global giants like GE, Siemens, Ebara, Alstom, etc. It is true that the teachers who are hardest on you, teach you the most. The six-month interaction with Mr. Hagiwara was indeed baptism by fire for the fledgling Enpro. Today, Enpro is one of the best known brands for lubrication systems globally. This would certainly not have happened if Mr. Hagiwara had not kicked asses at Enpro a long time ago.

Today Mr. Hagiwara is retired and at peace with himself; whenever his name is mentioned at Enpro, a smile lights up on every face that hears it. ●



Srikrishna B
Karkare

Srikrishna B
Karkare IITB B
Tech (Mech) C'
82,H5 or KRACK

as he is known to his friends in IIT, founded Enpro Industries in 1987 along with his wife Alka (nee Vaidya) (also IITB Btech Chem 82, H10). Enpro is a globally recognized brand in mechanical fluid systems. Alka and Krack are blessed with two sons, both also IITians: Siddharth (IITKGP Btech 2009) and Anuj (IITB B/Mtech 2014) .This makes them a unique ALL IIT family. KRACK and his entire family are keen mountaineers.

Reluctant Employees to Struggling Entrepreneurs

Gaurav Porwal & Sourav Panda

There are two routes to entrepreneurship – either you have an idea that prevents you from sleeping or you have a job that stops you from waking up. We strolled into entrepreneurship on the latter. Simple reason being that Gaurav wasn't too thrilled being at P&G's Beauty Care division talking to women about beauty while Saurav was slowly realizing that "consultants" were actually "con" men in Armani suits.

Half way through our MBAs we became convinced that we didn't want "a Job". And this started a wild goose chase of trying to figure out something, anything which we can find meaningful (and hopefully money-full). As luck would have it, we met Prof Jayesh Bellare (ChE) through SINE, where at the behest of DST, he had been trying to develop indigenous technologies for dialysis in order to reduce dependency on expensive imported medical devices. While working with him, we realized that both product and business model innovations were needed to make a dent in this massive problem. So while the development of various technologies is underway, we also sought to change the way dialysis is delivered to the patients. The end of this chase resulted in beginning of a journey that we have immensely enjoyed so far and the end doesn't seem anywhere near.

It was January 2010 and we were presenting our business plan at one of IITB's well-

Our typical day would involve waiting in hospitals for up to 6 hours for a 5-10 minute meeting (and yes – this was after taking prior appointments!).



known competitions. Our pitch was something like this - "There are almost 1.5 million people in India who need dialysis. However, less than 5% of these patients have the right kind of access". Suddenly one of the judges raises his hand and asks us - "What happens to the remaining 95%" and we said - "They die!" There was a stunned silence in the auditorium when we said this, as everybody tried to stomach the seriousness of the problem.

This hard-hitting fact motivated us to start Sparsh Nephrocare in October 2010 with a larger vision of making dialysis more affordable and accessible to kidney patients in India. While getting dialysis is more or less a right in developed countries where it is well covered by insurance, in India a majority succumbs to non-availability, high costs, and nearly non-existent health insurance cover. The problem is compounded by the lack of nephrologists (for a country of 1.3 billion people, we have a mere 1000 of them), no local cost-effective technologies, and a high



prevalence of diabetes and heart disease -- which eventually cause permanent kidney failure.

Working for oneself is fun but it is equally challenging, especially when you are working in a field where you have no background. We were two guys in our 20s trying to pitch to senior doctors to partner with us. Ask a Medical Representative about his regular day and you'll understand what it is to be a non-doctor trying to extract ten minutes of a doctor's time. Our typical day would involve waiting in hospitals for up to 6 hours for a 5-10 minute meeting (and yes – this was after taking prior appointments!). However, once we revealed our academic background, we were treated much better – something for which we remain grateful to the IIT brand. It so happened once that after waiting for a couple of hours, when we were pitching our proposal the doctor asked “Who's going to sign the agreement?” We replied that we will because we own the company. His next words were “Arre koi chai lekar aao!” Whatever doubts we had about being our own

boss simply melted away.

Our approach is inspired from what Capt Gopinath did in the field of aviation by creating Air Deccan. We are partnering with like-minded hospitals and doctors to build dialysis facilities in various parts of the country, while focusing more on no-frills units at Tier II/III cities. In the last 18 months, we have successfully launched 10 centers in cities like Hyderabad, Bangalore, Lucknow, Dehradun, Udaipur, and Chandigarh. We are privileged to have Banaras Hindu University, Varanasi as one of our partners where we run their complete dialysis operations and have reduced the financial burden on patients by up to 40% while increasing the service availability by 10 times.

Our mission is to bring more and more patients under dialysis care in a way which makes social and well as financial sense. We hope to keep expanding our Pan-India footprint by setting-up 100 dialysis centers over the next 5 years which can positively impact the lives of many patients. This might look

We hope to keep expanding our Pan-India footprint by setting-up 100 dialysis centers over the next 5 years which can positively impact the lives of many patients.



like a drop in the ocean but we strongly believe that we would have made a meaningful difference in the way patients are receiving care as compared to this day.

During our journey so far we have learnt a few things which we would like to share with other aspiring entrepreneurs.

Believe in Serendipity and avoid Analysis-Paralysis – Someone once said, “No one is unlucky. People just quit before luck comes knocking on their doors”. So many things that occurred in our business were due to sheer luck. We got the first doctor on board through a chance dinner. We found a great investor and business partner while trying to buy a machine. And all this happened while we were just going about our work in a

sincere and dedicated manner.

Never compromise on your principles – While running a business, it is way too easy to take short-cuts to meet short-term goals. Resist the urge and believe in good Karma. But at the same time beware, you’ll be surprised how quickly things can come back to bite you. Unfortunately, rewards take time but the wait is worth it.

Brand IIT knows no boundaries – Thanks to our alumni who have achieved greatness in almost every discipline worth mentioning, you’ll be relying on an established reputation to start with on day one of starting your business. All you have to do is to use the analytical and people skills learnt at IIT to keep you in good stead. We feel greatly indebted to IITB for continuing to open doors for us wherever we go.

To know more about Sparsh Nephrocare, please visit www.sparshnephrocare.com ●



Gaurav Porwal

Gaurav Porwal completed his Dual Degree in Chemical Engineering from

IIT Bombay (2005) and MBA from Indian School of Business, Hyderabad (2010). Before joining ISB, he worked at Procter & Gamble as a Scientist at its Kobe, Brussels, and Bangalore based innovation centers. He can be reached at gaurav.porwal@iitbombay.org



Saurav Panda

Saurav Panda complete his B.Tech. in Electrical Engineering from IIT

Bombay (2003), M.S. from Johns Hopkins University (2006), and MBA from Indian School of Business, Hyderabad (2010). He has worked as a consultant with Inductis, New York, advising companies on marketing and financial strategies. He can be reached at saurav.panda@gmail.com

Who Do You Think You Are, Steven Jobs? *(The Invention of Writing)*

Dr Rustom Kanga

(On discovering that his friend, Shirin, did not own or use a computer)

I am incredibly pleased to find
One who is so strong of mind
Who won't use a keyboard or a mouse
And doesn't have a computer in the house

What's wrong with traditional writing skills
You get pleasure from manually paying your bills
If computers are all you can use then
You will not recall how to use your pen

I will tell you a tale from long, long ago
As this isn't a new issue, you know

In Sumeria in the reign of Asherhods
At a time when all men talked to Gods
They learnt to chip on stone and hey
Writing was invented that very day

With chisel and hammer they honed their craft
If you couldn't chisel you were quite daft
In cuneiform they'd communicate
Chipping essays and poems on their stone slate

But if you were commuting to Stone Henge
Lugging rocks in your luggage was a big challenge
So innovation became the talk of the day
And someone discovered the new i-Clay

Then one day an Egyptian from Buxordobs
Whose name was Horus AmetobGobs
Who loved to create clever inventions
Decided to relieve them of all their tensions

While he was sitting on a camel bus
He came up with the idea of papyrus

No need to carry around lumps of clay
With pen and ink you can have your say.

This is bad said the mothers of Buxordobs
Who does he think he is - Steven Jobs?
Our kids - their brains will melt away
If they lose their skill of chiselling clay

They will spend all day playing with the pen
Coming back for a milkshake now and then
Does he think that we are silly old fools
They should ban these things from all the schools

It's possible that very soon
No kid will know how to chisel in stone
Everywhere they'll carry ink and pen
(The ballpoint had not been invented then).

So don't you dare blame Steven Jobs
The problem started with Horus Gobs



*Dr. Rustom
Kanga*

*Dr Rustom Kanga,
B.Tech. Chem.
Engg, C'73 went
on to get a Masters
in Management and a Doctorate in Finance
from the London School of Economics. After
a career in the oil and computer industries
he founded his own company, iOmniscient,
which focuses on Artificial Intelligence based
Video Analysis. Rustom indulges himself by
writing humourous stories, songs and poems.*

Sports Village Stories

Saumil Majmudar

After six years in the field of technology – three as a business guy in Wipro and three as an entrepreneur -- I was hunting for my next venture in 2003. Once, after many drinks and whiteboard markers, my friend Jay and I gave up on trying working out what we should do next. As we were leaving, Jay complained that his 6-year-old son hardly ever ventured out to play with his friends, and instead spent more time glued to the computer and the TV. Jay said it would be nice if there were safe playing areas for kids, and wondered if we should just take up empty plots of land, clean them up and let kids play there for a fee.

I have been a sports lover all my life. I was in the Maharashtra state badminton team. At IIT, I was in NSO Baddy, Inter-IIT football, and was the sports secretary and sports counselor. I have played all my life and so this idea just resonated with me.

I told my childhood buddy Jitu about it. He was then at KPMG in San Francisco, a former entrepreneur now hunting for something exciting to do. We spent hours chatting on Yahoo (no Skype back then) discussing our plans and service offerings. He relocated to India three months later and the three of us built on the idea of a safe place for kids to play -- and the whole notion of SportzVillage, which would focus on 'creating champions in life' came into being in 2003.

Our initial business model was simple - parents wanted their kids to play. Kids wanted to play too. But in cities, there were no safe places to play. SportzVillage was born.

We raised some money from friends and family, leased a 35,000 square feet plot in HSR Layout (south Bangalore) and converted it into a multi-sport place – cricket pitch, 5-a-side football area, 3-a-side basketball, floodlights, grass etc.

Naysayers told me that I was doing the Government's job and hence this would not scale.

The response was promising from kids and parents. Our original plan was to set this up as a model and then partner with folks owning real estate. But the model could not scale up as we could not extend the concept to government partnerships or real estate owners.

We started getting interest from companies, which wanted to use the venue for their team-building exercises. Over time, they

Our initial business model was simple - parents wanted their kids to play. Kids wanted to play too. But in cities, there were no safe places to play. SportzVillage was born.





started asking us to organize events for them, and we started doing inter-corporate and intra-corporate events -- something we had said (when we started) we will never do!

By this time, we had also exhausted all the money and were raking in a grand salary of just Rs 5000 a month. We had our 'strategy' meeting in 2004 when we said that if our venture hits a turnover of Rs 10 lakhs, we can take a salary of Rs 25,000 per month!

As we built on the events business, we got into raising sponsorships for our events as a way of making more money. In the beginning, sponsors asked us to execute sports media properties – as against sponsoring our events. We also sold tickets for the ICC Cricket World Cup 2007, F1 Malaysia etc – as a way of paying our bills!

Again, we had no clue how to do all these things. We just figured things out as we went along, asked people for help and met persons who gave us much-needed advice. To that extent, this helped to some degree – because even if you had no clue why you were doing something, the world felt that you had a grand strategy that nobody else was able to figure out!

At every point, our plan was to make money from corporate sports, sports sponsorship or ticket sales and then revert to the original plan of getting kids to play.

We tried multiple businesses and models, including a sports technology venture (sports, social media, social networking, and user-generated-content) as a way of building something scalable. We also consulted with a large South Indian business house about setting up a sports retail venture.

Many of these plans did not work out – and we kept running into dead-ends.

Finally in 2008, we revisited the kids and sports space and decided to focus on schools. EduSports was formed with the vision of developing a generation of healthy and fit children through the magic of sports. We developed our own structured, age-appropriate in-school sports and physical activity program that helped kids get physically and socially fitter.

Again, we raised money from friends and family and then a venture capital round from SeedFund.

Today, EduSports (www.edusports.in) works with more than 200 schools and is helping 1.5 lakh kids get healthier and fitter through a structured in-school sports program.

Jitu built the events/sponsorship/ticketing business that is now SportzConsult (www.sportzconsult.in). It is a sports management

business that helps sponsors to leverage the power of sports. SportzConsult works with leading brands like Coca Cola, Hero Honda and many others.

Today, many people talk about how we were visionaries and saw an opportunity in sports way before others. I think the only reason we are still around is that we refused to give up. No industry report, no consultants, nobody was talking about sports in the first five years. A well-wisher and senior from IIT

A well-wisher and senior from IIT actually told me in 2006, “Come back to the real world. You have enjoyed yourself for the last 3 years doing something in sports. Now take up a real job or join a real venture.”



actually told me in 2006, “Come back to the real world. You have enjoyed yourself for the last 3 years doing something in sports. Now take up a real job or join a real venture.”

Now, suddenly, people think that sports can be a big business and we get a lot more attention for what we are doing.

Finally, if you believe in the idea and stick to it, results show up. Maybe the real learning from IIT is the perseverance and focus on staying with a problem and “cracking it”.

It’s been nearly nine years -- a great ride, lots of ups and downs. More downs than ups in the first six years. I think we always felt that we could “crack” this but it turned out to take a lot longer than we thought. And now we look forward to an exciting phase of growth going ahead! Growth is a good problem to have – nevertheless. ●



Saumil
Majmudar

An IIT B alumnus, Saumil as Founder-Director of SportzVillage and Co-Founder & CEO of EduSports, Saumil has personally engaged with over 150,000 children, 50000 parents in the school sports context over the last decade. Recognized as one of 50 leaders changing Indian education by Education World, Saumil has been working with schools, federations and policy makers towards creating more quality opportunities for children to experience the magic of sports.

Sudheendra Kulkarni, B. Tech (Civil), C80 was a special aide to former Prime Minister Atal Bihari Vajpayee in the PMO from 1998 to 2004. He is currently a member of the National Executive of the Bharatiya Janata Party and he has also been a columnist with the Indian Express for the past seven years. Sudheen, as he is fondly known, was featured in an interview in our maiden issue of Fundamatics and he has agreed to write a regular column for us, titled "Tantra aur Gyan". In this issue, he starts with an excerpt from his forthcoming book MUSIC OF THE SPINNING WHEEL: Mahatma Gandhi's Manifesto for the Internet Age. Pages 750; Rs. 595; published by Amaryllis, New Delhi. He requests you to send your comments to sudheenkulkarni@gmail.com <<mailto:sudheenkulkarni@gmail.com>>

Bumblebee



Is the Internet an avatar of the Spinning Wheel?

Sudheendra Kulkarni

Mahatma Gandhi remains a deeply enigmatic figure in India and the world. Easy to admire, difficult to understand in his totality, and almost impossible to follow even in parts. There is very little about his outward personality - his attire, his extremely frugal food habits, his observance of a day of silence once a week, and his unconventional views on sex - that can conceivably endear him to the modern man living in the most consumerist and hedonistic era in human history. Yet, Gandhi has become the most popular and venerated Indian name around the globe. There is something about the inner truth of his life, whose glow remains undiminished with the passage of time. We may call it Gandhi's Truth since his lifelong pursuit of truth was heroic, holistic and unique enough to justify that extraordinary description. It not only sheds light on the failures and falsities, injustices and inadequacies, of the world we live in, but also shows the way forward.

At a time when India has been witnessing rapid erosion in ethics in politics, economics and public life in general, Gandhi is admired for practising the moral principles that he preached. As India and much of the rest of the world continues to grapple with the challenge of religious disharmony, his lifelong mission of trying to create harmony across various social barriers continues to evoke widespread adoration for him. Indeed, his mission culminated in his martyrdom for the

cause of amity between Hindus and Muslims, and also between India and Pakistan. Ironically, it was a Hindu extremist who assassinated the greatest Hindu in modern times. This fact of history makes his message especially relevant, both for India and the world, considering that the cause for which he sacrificed his life is as salient today as it was in his own lifetime.

Above all, admiration for him stems from his uncompromising advocacy of nonviolence, which was the defining element of Gandhi's Truth. It is not that most people who admire him for this reason truly believe that the ideal of a nonviolent world is ever realisable. Nevertheless, they see in him the source of their own hope in a just and peaceful tomorrow. It is a hope men cannot live without. He nurtures that hope both at local and global levels. For example, the United Nations, which is the closest the international community has come to establishing something akin to a world government, may not have made much headway in de-militarising international relations and creating a new world order based on peace, justice, universal brotherhood and cooperation. Yet, when it declared, in 2005, that Gandhi's birthday on 2 October would be observed each year as the Day of Nonviolence, it acknowledged him as a modern-day prophet of peace.

What is curious about Gandhi's Truth is

that neither is it easy to grasp, nor easy to reject. His admirers appreciate some aspects of his life and message, but find it difficult to comprehend or agree with other aspects. Similarly, his critics may scoff at some of his actions and teachings, but usually, they too express varying degrees of appreciation for what he set out to achieve and for the sincerity and single-minded focus he brought to bear on his mission. Thus, it is easy to find critics among his admirers, and admirers among his critics.

The one aspect of Gandhi's Truth that is most enigmatic is his outlook - or perceived outlook - towards science and technology. By and large, both his admirers and critics contend that he was opposed to science, technology, machinery and modernity. We are currently in the most technologically advanced era in its history. Science and technology has transformed the world in unimaginable ways. They are also the principal factors behind the unprecedented material prosperity that some sections of the global community have been enjoying and others are eagerly hoping to be a part of. This has persuaded many people in India and the world to believe that Gandhi, with his insistence on khadi, village industries and maximum local self-sufficiency, sought to stop the onrush of development aided by modern science and technology. Therefore, on the yardstick of technology-driven progress, many of Gandhi's admirers and critics alike consider him irrelevant to our times.

According to historian B.R. Nanda, who was one of the greatest interpreters of Gandhian philosophy: 'Gandhi's views on industrialisation did not commend themselves to the Indian intelligentsia, and even to many of his colleagues in the Congress leadership. To many of his eminent contemporaries — scientists, economists, industrialists, radicals, socialists, communists — Gandhian economics seemed a throwback to primitiveness; to

a utopian pre-industrial position which was untenable in the modern world'.

But was Gandhi really opposed to industrialisation and to modern science and technology? Did he, with his unusual ideas on development, seek to take India back in time - to the 'dark medieval age', as some of his critics claim? Or was he a visionary who not only foretold the impending crisis in sustainable development that both India and the world are currently experiencing, but also showed an alternative path of development that is pro-people, protective of the environment and also promotive of human evolution to a higher level? Was he utopian in his insistence that science, economics and ethics must go together, or was his insistence a warning that the world has ignored at its peril? Would he have shunned the Internet, arguably the greatest technological invention of mankind, or embraced it? What would he have said about nanotechnology, artificial intelligence and other breathtaking promises of science and technology in the twenty-first century?

Ever since my interest in Gandhi developed from the superficial to the serious, the question that began to agitate me with the force of an intellectual storm was this: How can Gandhi be relevant to our times in terms of his spirited advocacy and scrupulous practice of nonviolence and universal brotherhood, and yet be irrelevant on a parameter — the impact of science and technology — that uniquely defines the modern world? After all, Gandhi's Truth cannot be considered holistic enough, or even true enough, if it really was disdainful of the truth represented by modern scientific knowledge and its myriad beneficial applications. Therefore, I felt it necessary to resolve this contradiction by delving deep into Gandhi's ideas on science and technology.

The more I dug into this subject, the more

convinced I became that, Gandhi was far from being an opponent of modern science and technology. On the contrary, by redefining development, the Gandhian vision seeks to relocate the place of science and its practical uses in the overall terrain of human affairs where it can promote mankind's holistic progress, and not be used for exploitation and violence.

My curiosity to explore this subject was initially whetted when eminent scientist Dr R.A. Mashelkar, whose ardent advocacy for people-centric development of science and technology I greatly admire, delivered a talk at the Observer Research Foundation (ORF) in Mumbai in April 2010 on 'Gandhian Engineering: More from Less for More'. If everything about the title of the talk was tantalising, its content would have made Gandhi truly happy. However, the first response from many of the puzzled invitees was: Do 'Gandhi' and 'engineering' go together? Engineering, they said, is all about machines and industries, whereas Gandhi 'was opposed to industrial development and production by machines'. When Dr Mashelkar informed me that he and renowned management guru Dr C.K. Prahalad (who sadly passed away just a couple of days before the talk) had collaborated to popularise the concept of 'Gandhian Engineering' globally, I felt even more eager to delve into an aspect of the Mahatma's life and legacy that remains widely misunderstood and inadequately explored even today.

The purpose of this book is not merely to dynamite the mountain of misconception on this score that survives even six decades after Gandhi's death. It is not merely to demonstrate that the moral symbolism of khadi and the charkha (spinning wheel) has an abiding relevance for the twenty-first century. Rather, it is also to postulate that the Internet - and all other digital-era technologies supported by it - have the potential to realise the kernel

of what Gandhi had been envisioning to achieve through the spinning wheel: a new nonviolent, inter-dependent, cooperative, sustainable and morally guided world order. In the course of my study, I discovered that the development of modern science and technology, of which the Internet is the most universally used product, is proceeding in a direction that has the potential to realise this Gandhian vision.

To my own amazement, I found that the future world shaped by digital technologies could well validate and actualise the fundamental philosophy of the spinning wheel. This has happened because the socio-economic and political conditions that gave rise to the use of science and technology in the pre-Internet era for the domination and disempowerment of large masses of people, are speedily changing in the age of the Internet. A new networked global community has come into being in which the Internet and digital technologies are providing intellectual and practical tools to the common people to change social, political and economic structures. Indeed, as far as the transformative power of the digital-age technologies is concerned, mankind has so far seen only the tip of the iceberg. Our world is going to change beyond recognition at all levels — global, national and local — and some of these far-reaching changes could become visible as early as by the middle of the twenty-first century.

This change will mean transition from globalisation to glocalisation; from centralisation to decentralisation; from power and prosperity in the hands of a few to many; from prosperity defined purely in material terms to that which gives primacy to the richness of culture and ethical values; from unhealthy competition to healthy cooperation; from an exploitative attitude towards nature and its resources to an attitude of

harmonious co-living. The disconnect between economics and ethics, which the world has experienced for the past several centuries with the onset of colonialism and the mad race to conquer distant markets, will be substantially reduced. Old technologies gave birth to this exploitative order. New technologies are digging its grave. At least some forms of large-scale violence, such as wars between nation-states, will become a thing of the past. Isn't this what khadi and the spinning wheel of Gandhi's conception stood for?

This discovery and its comprehensive exposition, I modestly claim, are this book's distinctive contribution to the study of Mahatma Gandhi. All the eleven chapters in the last part of this book are devoted to this theme. Among other things, I have attempted to show how Gandhian ideals have been echoed by many pioneering thinkers and innovators in the world of digital technologies - Norbert Wiener, Alan Turing, Vannevar Bush, J.C.R. Licklider, Jon Postel, Tim Berners-Lee, Richard Stallman, K. Eric Drexler, Lawrence Lessig, Bill Joy, Jaron Lanier and others. Another legendary name — Steve Jobs — is included in this list. His biographer Walter Isaacson tells us how Gandhi was one of Jobs' personal heroes who inspired him to 'Think Different'.

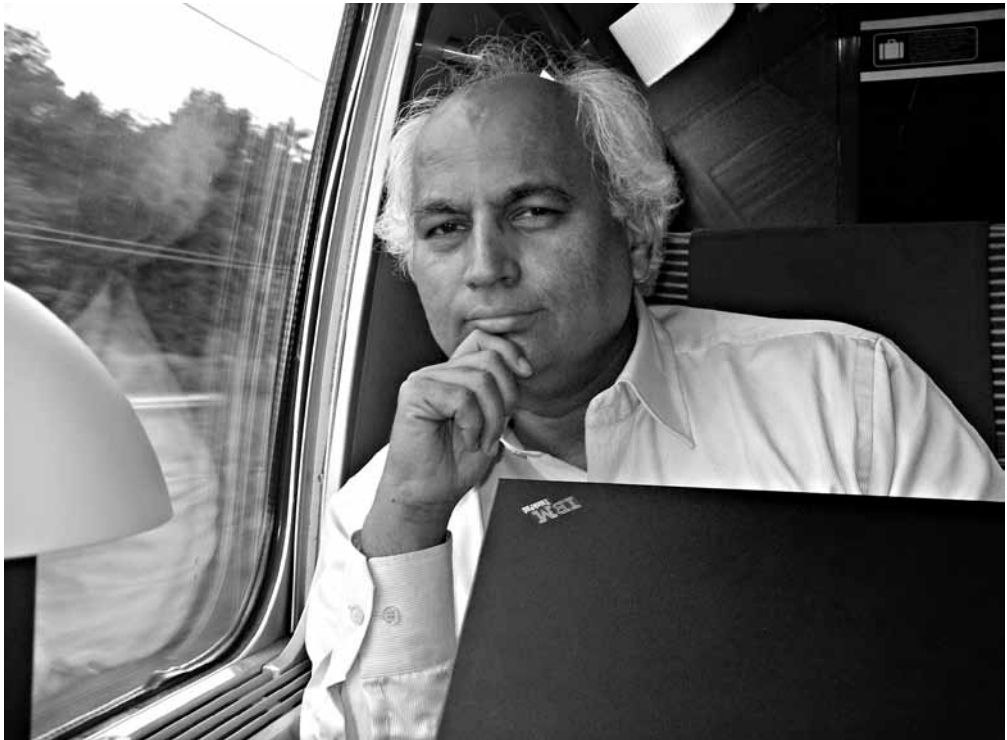
All Big Ideas in history have two aspects: that which is true for a particular time and space in history, and that which is timeless. Some of what Gandhi sought to achieve through the spinning wheel had temporary relevance, which was circumscribed by the historical context and the specific needs of India's freedom movement. It is no longer germane to our times. However, much of the Gandhian agenda is also of abiding relevance for India and the world. Indeed, this latter aspect of the message of khadi and the charkha has in many ways become more relevant in the twenty-first century than when Gandhi was

alive. The Internet, as we shall explore in this book, has the capability and an opportunity to actualise the ageless ideals of the spinning wheel.

The principal learning from Gandhi's charkha movement is that technology must empower the common man and that it should be a binding force for society to pursue a lofty goal. Both of these are true for the Internet. Anyone can connect to it freely (although this freedom needs to be actively safeguarded). Anyone can benefit from, and contribute to, the ocean of information and knowledge contained in it. In the process, the Internet has also become a new binding force on a planetary scale by bringing individuals, groups, countries and cultures together in virtual as well as real spaces. Indeed, it is midwifing the birth of altogether new communities cutting across physical, racial, religious, economic and cultural barriers. Thus, it has become more than a technology of empowerment; it has become an ally in human evolution.

Lest I be misunderstood, I should hasten to introduce a necessary caveat here. I affirm that the Internet has the potential to realise the ideals that Gandhi associated with the charkha. However, whether its potential is substantially realised in the coming decades or not depends on a number of other socio-political factors, which too have been identified in the book.

Gandhi was passionately wedded to the scientific spirit. He gave pride of place to science both in his vision of an ideal society and also in his practical experiments aimed at creating a new paradigm of village-centric economic development that gave the first priority to the last man in society - the philosophy of *Antyodaya*. Moreover, although the spinning wheel was at the centre of his economic and social campaign, he was by no means dogmatic



about it remaining the sole instrument of his economic philosophy forever and everywhere. He repeatedly urged both his followers and his critics to understand what khadi and charkha stood for, what they connoted, and what he sought to achieve through them in a specific historical situation in India. During India's liberation struggle, his leadership of it had achieved the impossible with khadi — it became a mass movement with a nationwide sweep for the first time in its history. In the words of the celebrated French writer André Malraux, Gandhi made the entire nation wear 'a humble plebian garment (like) the uniform of freedom'. Jawaharlal Nehru, India's first prime minister, poetically described that khadi had become 'the livery of India's freedom'. Gandhi himself repeatedly affirmed that khadi was not merely a *vastra* (cloth) but a *vichar* (an idea and an ideal). However, Gandhi also made it clear that

the charkha was not to be a fixed feature of India's economic development forever. He had contemplated a 'better substitute' for the charkha in a changed socio-economic situation. He was willing to accept a different set of machines and industries capable of promoting the ideals he associated with khadi and the spinning wheel — namely, a nonviolent, non-exploitative and harmony-promoting economic development.

Indeed, towards the end of his life, Gandhi was anticipating the birth of a new technological device, a nonviolent machine that 'helps every individual' in the world. A primary objective of this book is to posit that the Internet fulfils the expectations of the machine that Gandhi had been visualising. Obviously, he could not have pictured in his mind the Internet or the birth of the digital era. Nevertheless, it is one of the little-recognised facets of Gandhi's greatness that he

was hoping for the arrival of a new scientific tool that would promote his vision of a just and holistic development of the entire human race. His choice of the spinning wheel as a symbol to proclaim his vision was, after all, dictated by his socio-political mission — primarily, but not limited to, India's liberation from the British colonial rule.

The choice was deliberate: he opted for the simplest and the least technologically developed tool to symbolise his mission only to underscore the fact that the Western economic system had misused modern science and technology for colonial exploitation and for promoting a soulless materialistic 'civilisation', both of which necessitated wars and violence on a massive scale. However, Gandhi had a strong historical sense to affirm that the European domination of the world was 'a nine-day wonder', and that the future would summon a just new global order if backed by a sufficiently powerful, determined and well-directed human effort. He was acutely aware that new tools of science and technology would be needed in the future to realise what the spinning wheel stood for. The claim of this book is that these new tools, which can fulfil the promise of the spinning wheel, are represented by digital technologies anchored in the Internet.

A good deal of the new research over the future of the Internet substantiates the main argument in this book. For example, In *World Wide Mind – The Coming Integration of Humanity, Machines and the Internet*, author Michael Chorost posits that the coming together of the human mind and the machine mind can make all of us more human and not less. In *Program or Be Programmed – Ten Commands for a Digital Age*, media theorist Douglas Rushkoff writes: 'We are creating a blueprint together — a design for our collective future. The possibilities for social, economic, practical, artistic and even spiritual

progress are tremendous. Just as words gave people the ability to pass on knowledge for what we now call civilisation, networked activity could soon offer us access to shared thinking — an extension of consciousness still inconceivable to most of us today'.

Similarly, Neil Gershenfeld, director of the Center for Bits and Atoms at the Massachusetts Institute of Technology (MIT), and author of *FAB: The Coming Revolution on Your Desktop – From Personal Computers to Personal Fabrication*, expresses the hope that the progress of digital technologies can bring joy and 'spiritual liberation'. Gandhi would have been pleased by the pioneering work that scientists like Gershenfeld have been doing at the grassroots to use digital technologies for rural development across the world, including in India. Discussion on the future of the Internet forms a significant part of this book.

Actualisation of the enormous potential of the Internet to promote nonviolent and sustainable development depends on the morally self-restrained conduct of individuals and institutions. Hence, this book also contains my philosophical speculation about the future of information technology, based on some prescient thoughts of Gandhi himself on satyagraha and swaraj.

'Prediction is very difficult, especially about the future,' said Niels Bohr (1885-1962), the celebrated quantum physicist. Nevertheless, the fundamental prediction this book makes is that the marriage of modern technologies with swaraj and satyagraha will shape tomorrow's nonviolent world. This optimism is based on the fact that the latest developments in information technology and other futuristic technologies (genetics, nanotechnology, robotics etc.) all tell the story of science's journey from man's outer reality to his inner reality.

‘The wholest of men, and one of the most miraculously energetic’ is how Erikson has described Gandhi in his book. It’s not my claim that I have attempted to capture the ‘wholeness’ of Gandhi’s life in this book.

Nevertheless, I have humbly set out to portray his integral, non-compartmentalised, scientific and ethics-inspired worldview... Such a portrait will show that, far from being anti-science, his worldview elevates science to a higher level of human pursuit and imparts to it a nobler purpose that is consistent with both mankind’s needs and the Divine Law. It is my firm belief that only a holistic Gandhian worldview - and reform of individual and institutional conduct based on such a worldview - can help India, and the rest of the world, overcome the gigantic challenges they are facing.

I would like to emphasise one more thing: This book is not the work of idle academic curiosity about an iconic figure of yester-years. It is a call to action and service, based on my reflections on what Gandhi means to India and the world, today and tomorrow. Our country, in particular, needs to rediscover the relevance of his teachings if it is not to commit the follies of its own past and, also, if it is not to repeat the follies of the West. In his teachings, we find the right guidance to reunite our divided society and also our fractured subcontinent. In his teachings, we find the right principles to reform our economic and political systems, both of which are today mired in deepening corruption. In his teachings, we find that a new and harmonious Man-Nature relationship, which is now badly ruptured to the detriment of both, can indeed be created with the right use of modern technologies. Finally, his teachings are also a call, as described in this book, for human beings to become ‘more than human’ by ascending the Godward evolutionary path.

I have summed up my appeal for action in the epilogue by saying, ‘It’s time we all became Internet Satyagrahis’. A new age is dawning. This is not the hour to be caught asleep. ●



Atlas Shrugged

Jumblebee

Yes, the world atlas did shrug...wondering why Jumblebee spent so many painstaking hours to poke pins at 312 cities spread out over 60 countries in the world where 16,431 alumni of IITB, out of a total of 37,739, are known to reside? Yes, the data entered by alumni may not be updated well enough. Yes, some alumni spend 6 months a year in India and the rest in USA. One kid studies “there” and another lives “here”. Spouses sometimes travel with the alumnus/alumna but more often than not, they travel away from each other. In such cases, the city of residence is decided by the address of the dog that he/she owns.

Notwithstanding the scope for errors and the incompleteness of the data, we believe that the available data is fairly representative and the following analysis -- totally useless trivia (TUT) -- may not alter much even if the lazy alumni fill up their directory info completely.

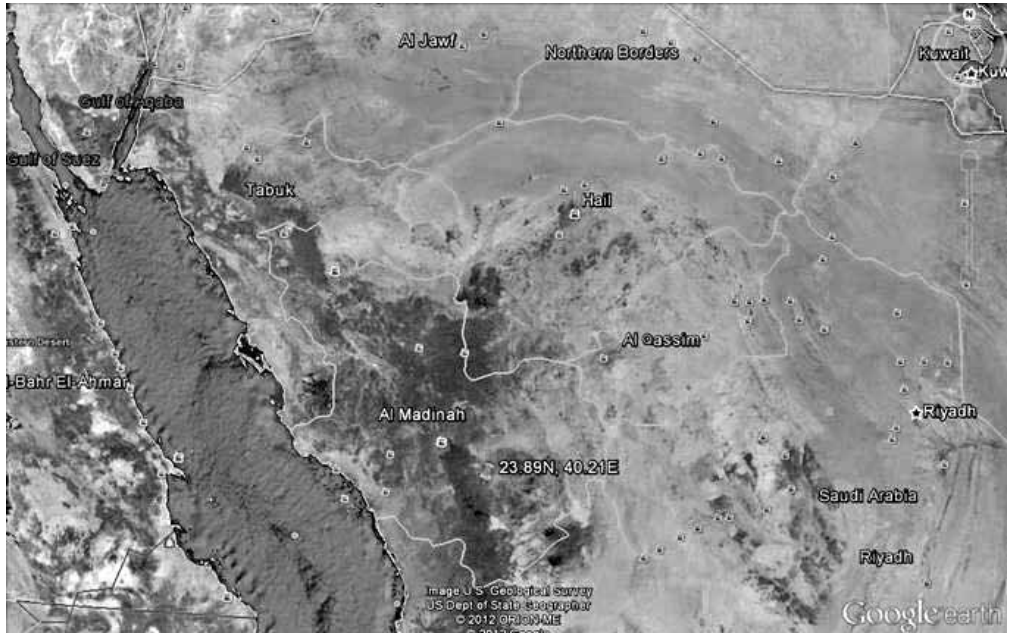
To make our job easy, we had to undo the hard work of town planners and municipal councilors. For instance, we had to Ahmedabad-ify Gandhinagar and Hyderabad-ify Secunderabad. To us, the difference is as trivial as it is between metallurgy and material science or between aeronautical and aerospace.

For alumni from the sixties, seventies and eighties, who believed that most brains

drained westward, we’ve got news. Over 74.81% of the alumni reside in mama land, 20.55% reside in Obama land and a mere 4.64% reside in 58 other lands, including Osama land. Had we looked at the average location of our alumni in the eighties, we may well have landed somewhere in West Africa. In fact, if we consider just one alumnus residing in each of the 312 cities, including 110 Indian cities, 102 American cities and 100 ROW cities, the average location of our alumni would have taken us to 26.89 deg N and 8.6 deg E. That is somewhere in the middle of an exotic desert-looking landscape in Illizi in Northern Africa. But MA courses from our own Maths department have taught us to add weight to our averages, an act that will expectedly move our average eastward: 23.89 N and 40.21 E to be exact.

Satellite images show that this location -- south east of the holy city of Madina in Saudi Arabia -- looks barren enough for hosting a huge global alumni meet with 16,431 or more alumni. Hosting an event at the average location will reduce the overall distance travelled, which in this case totals to over 7.5 crore km and averages to about 4580 km per alumnus.

We cannot help but marvel at the coincidence that our average alumnus finds herself closer to a region which is the confluence of three great continents -- Asia, Africa and Europe --



as also the confluence of three great civilizations: Egyptian, Greek and Turkish, as well as the region that originated three great modern religions: Islam, Christianity and Judaism.

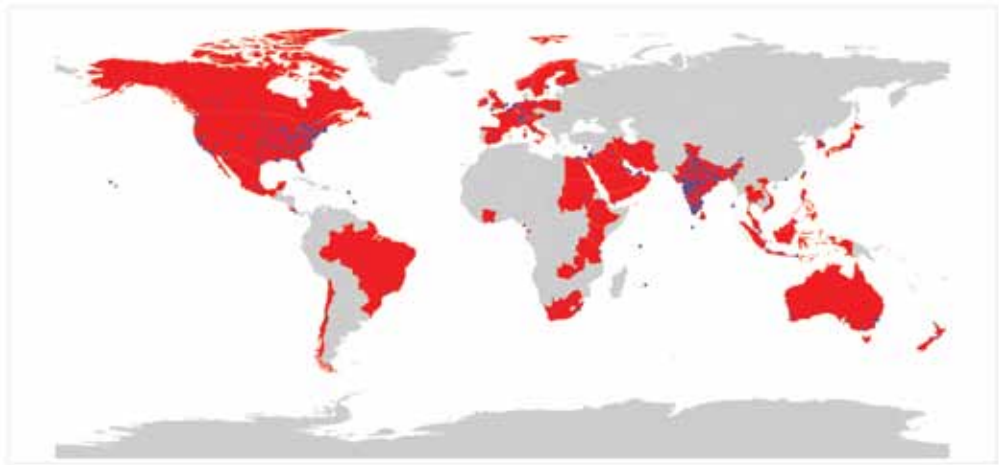
In fact, this is the very cradle of civilization. Just as the early civilized society migrated eastward from the Asia Minor region, we may well find our alumni's average location moving eastward as the new batches turn out graduates, 90% of whom stay back in India. Of course, it may also be coincident that this region is also the source of some of the great strifes and wars of the present age, quite reminiscent of angry and acrimonious GBMs we had in our hostels.

This brings us to the question. What is the weighted average location of an India-based alumnus? 19.68 N and 75.88 E, according to our painstaking research. Where does this land us?

Somewhere in the middle of plotted agricultural fields between Ambad and Jalna in Maharashtra. Our strong contingent of 3923

Mumbaikars and 1483 Pune-kars has ensured that the coordinates of 12,292 Indian alumni gravitates to an average location within Maharashtra. And what about USA? 38.53N and 88.28W points to yet another barren land near Mt. Eire in Illinois. Clearly, the East Coast's pull is stronger than that of its western counterpart. What about Rest of the World i.e. ROW? Now this one is a stunning coincidence. At 27.00 N and 8.6 E, this location is very close to the average location of all alumni. But it is in the Red Sea, close to the Gulf of Suez but closer to the shores of Egypt than of Saudi Arabia. With Europe pulling the average north and Africa and Australia pulling it south, while Singapore et al pull it towards eastwards, the average ROW alumnus is clearly "at sea". This, of course, opens up the possibility of hosting a ROW alumni meet aboard a yacht, if it can host 762+ alumni.

To continue our TUT further, our shrugged-out atlas showed our easternmost and southernmost alumni as residing in Wel-



lington, New Zealand. Northernmost alumni are in Oslo, Norway and Stockholm, Sweden. At close to 60 degrees north, they are two-thirds towards the North Pole. And the westernmost alumni are in Honolulu, Hawaii. Incidentally, the distance between the easternmost Wellington and the westernmost Honolulu is a mere 7484 Kms, which is less than the distance between most cities in India and USA. Proof of the fact that east meets west? The world is round?

And the distance between northernmost Oslo and southernmost Wellington is a whopping 17,661 Kms. Proof that north does not meet south? That there is a need for a north-south dialogue?

How many countries are home to just one alumnus? As per our database, thirteen: Ethiopia, Yemen, Bangladesh, Sudan, Sri Lanka, Mexico, Finland, Equatorial Guinea, Vietnam, Iraq, Mauritius, Chile and Jordan. Surprising, considering that countries like Ivory Coast, Cyprus, Costa Rica have two alumni each. Is there any prominent country that does not have any of our alumni? Our eyes could scan only China. Surprisingly, the most populated country in the world is not populated with IIT alumni. We attribute this strange phenomenon simply to lazy fingers

and unused keyboards.

To repeat a point made earlier, all this and much more that we may unleash in the future issues of Fundamatics, are TUT i.e. totally useless trivia. Just as our intrepid alumni have travelled all over the globe, we decided to travel all over the atlas and put our knowledge of averages, calculations, cartography, trigonometry and coordinate geometry to good use. By generating such useless data, we hope that more alumni will update their data and help us move the average away from barren lands and stormy seas.

How else can we end this except with, "TUT....TUT, the world is round and spinning, so is our head." ●

Reviving the New Stone Age

This is the story of an alumnus who wishes to remain anonymous. He has been an entrepreneur for almost 30 years now and has never worked with anyone before as he was quite sure that nobody would ever agree to employ him, given his mediocre academic record. A lot of his learning was outside the classroom and hence, he believed in the virtue of taking a headlong plunge, committing mistakes and learning things the hard way. His choice of a vocation trading in stone was a part of the plunge and very unlike-IIT. Yet, with a high degree of success after 30 years and over 10,000 successful installations, Bumblebee got him to share his thoughts, learnings, experiences and anecdotes for our readers.

Stumblebee

“Kya re! IIT ka degree leke marble ka dukaan khola kya? What a waste of a degree?” This was the admonishment I received from a Chief Minister of Goa during a pre-lunch appetizer on Alumni Day in the year 2000. I wasn’t sure whether he was serious or kidding. After the customary “Look who’s talking” exchanges, we savoured our lunch and I then delivered him some dessert by way of my rejoinder. “So you think I am running a roadside marble ka dukan?”, I let it pass. He must have envisioned a place stacked up with inventory, trucks carting stuff in and out, the munimji ripping up bills, the din of

masons chipping away at stones, and masons coming in frequently asking for bakshish for palming off defective pieces to unsuspecting customers.

This was a far cry from the reality -- I was running a full-fledged factory that was equipped with 12 calibrated cutting machines, two pneumatic polishers and special arrangements for beveling, moulding, edge profiling, complex inlays, borders, motifs and patterns. There was a high-end CAD centre which first created visual rendering of the end product.

Material was spread out on a two acre yard and graded for quality and consistency. After painstakingly processing a customer’s requirement, the entire product was spread out on the yard (dry laying as we call it.) The customer could see his finished floor on our factory yard, before it was carted off to his site, executed in a swift commando like operation that did not require any machinery at his site or depend on highly skilled craftsmen. Between the factory and customer sites, there were 300 personnel in all to execute projects. This was the only factory of its type in India and our unique process made it economical for establishments ranging from small apartments to 5-star deluxe hotels.

We interacted with leading architects and interior designers from all over the world, mainly the UK, Germany, Singapore, the

USA, Malaysia and Hong Kong. Our technique and expertise made it easy for us to execute jobs all over India and different parts of the globe, since most of the work was prefabricated at the factory. Work backlog usually ranged between 5-6 months and all our clients were recommended by architects familiar with our work, or by word of mouth. We never advertised or participated in any exhibition, nor did we use any tie-sporting, suited-booted, Angrazi speaking sales team. In fact, to this day, our establishment does not display a name board.

With over 10,000 satisfied customers in our portfolio, I look back to confess that the journey has not been easy, although it has been a lot of fun. How my brother and I meandered into the marble industry is an interesting story, and beyond the scope of the word length prescribed by the stingy Fundamatics team. When we announced our decision to our father, he advised: us with simple sagely wisdom. "Don't get into the marble trade. It's not a gentleman's business." I still recollect the look of amusement mingled with pride when we told him, "Don't worry! We'll make it a gentleman's business."

Our initial and most valuable learning came from our first job, which was a disaster of sorts. For an L-shaped kitchen counter, we had dispatched two slabs to the site, one of which was six feet long and the other nine feet. Before we could reach the site, the mason placed the 9-foot piece on the 6-foot segment of the counter and cut off the extra 3 feet (with a chisel and hammer. This was before the days of portable cutting machines,) and our customer called to say that we had delivered one piece that was short in length. This experience taught us the nature of the business and its pitfalls.

What we set out to do and the business model we evolved turned out to be quite

different from what was originally envisaged. We grew into it and let our business evolve. We frequently put ourselves in our customers' shoes and asked ourselves what would satisfy us had we been the customers. Customers wanted excellent quality and quick execution at a reasonable price. We started quantifying what constituted good quality. Fine joints? High degree of polish? OK, fine -- how do we measure joint thickness and polish levels? We looked at what the market had to offer. More importantly, we zeroed in on what the market did NOT offer. This gave us a clue to most of our questions; proceeding in the right direction was only a matter of time. Our seeming handicap -- lack of experience and knowledge -- turned out to be our greatest strength. It allowed us to chart a course that was never traversed before. An open mind, not bogged down by conventional wisdom, is susceptible to committing major blunders, but is also a fast learner. Thus, after experiencing some disappointments with unscrupulous suppliers, non-paying customers and obstinate masons, we integrated both forward and backward and focused on firming up processes that have stood us in good stead. Some of the important steps were to procure raw blocks directly from identified mines, and evolving a factory-centric processing facility to avoid unexpected shocks at site locations.

Our work hours are long and arduous. Tax raids are frequent. But there's a smile on our faces at the end of the day, coupled with the joy of being profusely thanked and appreciated by reputed designers, film stars, politicians, hoteliers and other eminent persons. Creativity and innovation are now an integral part of our erstwhile left-brain analytical side. We look forward to the daily dose of excitement, the thrill of meeting talented people who bring us new projects, of



each being different. And with each successful implementation, we climb further up on the ladder of success.

We encountered many amusing moments. Petite women who ask us to take “my measurements.” Clients asking us to remove the polish on the floor because their spouses refuse to wear a skirt while walking on a highly glossy surface. Trendy designers who ask us to meet them in the bathroom upstairs. My most memorable incident relates to the time I walked into a contractors’ coordination meeting conducted by the GM of a 5-star hotel chain; this hotel being my first major project. When I was introduced to him as “person from the marble agency,” the GM with his been-there-done-that look told me, “I am conducting this meeting in English. I hope you don’t mind.” It was a simple extrapolation from his experience, when he must have seen countless marble contractors wearing safari suits, chewing paan and wearing thick gold chains. Marble and English did not go together. When it came my time to present my work schedules, I could see the GM’s jaw drop when I presented a Gantt Chart and spoke about work sequence and

method statement in near perfect engineering lingo.

To be fair, I did try to remain loyal to my chemical engineering department for almost a year, trying to manufacture explosive-grade ammonium nitrate. The project had to be abandoned after I realized that ammonium nitrate was in fact sold in the market by buying a subsidized fertilizer (CAN) from farmers’ cartel in the black market and recovering the ammonium nitrate from that compound. Once again, looking back, maybe the fact that I didn’t pursue my academics seriously may have worked well for me. Otherwise, I would have remained stuck trying to manufacture products that could be conjured in the market by using the age old route of resorting to malpractices.

Ultimately, what I treasure most about my experience is the fact that I could inject the IIT mantra of excellence and innovation into a trade that is otherwise notorious for custom duty evasion, under-invoicing, fudging measurements and the like. To quote the words of a Bong architect, “What you are doing is simply marbellous! You have brought in a new stone age.” ●

Handling employee compensation blues

Raj Aphale

As we rise up the corporate ladder, we need to make decisions in areas that we technocrats love to call “non-technical”. Fixing compensation, or compensation management, is one such area. Decisions about remuneration are even more critical as they affect the morale and performance of the workforce. In this talent-starved, competitive world, we can hardly afford that. As IITians, we always talk about knowing the fundas. So here are the fundas about compensation management from a guru.

Bumble Bee

Have you ever seen employees happy with their salaries? Are they happy for a long time (beyond 6 months) after you gave them the generous raise? If yes, you are one of the few lucky folks. Send me your names and I'll publish them in the Compensation Hall of Fame! Deciding on the right salaries i.e. neither too much nor too little is a challenge that businesses are facing currently. We, as technocrats, love to avoid these issues, or try and find a quick fix that eventually aggravates the situation in the long run.

More often than not, people seem unhappy with their compensation. Perhaps it might be correct to say that they are unhappy to see what someone else gets! The fundamental reason why people are unhappy is because they tend to compare their compensation or some aspect of the compensation with

that of someone else. That someone else can be their batch-mate, their colleague in the same department or some other department, people in the same industry, another industry, another country, their colleagues from their previous jobs and so on. Interestingly, even when they choose to quit their earlier job and join you, once the happy hours are over they start complaining about some issues, telling you how the earlier company was generous. There will be complaints about taxes withheld, increment amounts, increment percentages, size of the car, or number of holidays in a year.

We should listen to them carefully, as all the ‘cribbing’ is not baseless. They may point out some inconsistencies in our policies that we may not have noticed. Compensation complaints have two components: the rational and the emotional. It will be wrong to miss the rational part. In one company, for example, it was noticed that those who joined as trainees and now have a year’s experience were paid lesser than freshers. Yes, this happened, and that too in a large MNC. Or there were instances of discrepancies in certain allowances between different locations. These need to be listened to, noted and corrected as soon as possible.

The other type of complaints -- emotional -- cannot be handled by logic and have to be dealt many times on a one-to-one basis.

Compensation complaints have two components: the rational and the emotional. It will be wrong to miss the rational part.



While we may explain the logic behind the decisions, issues like “I work harder / smarter than someone else” or “I have more responsibilities at home / my neighbour has bought a new car, so I need more money”, or for instance “whatever he knows is all because I taught him and now he gets more increment than me” type of complaints are going to remain and we sometimes have to let people to realize the irrationality themselves.

It is clear that on compensation issues, we cannot satisfy everyone all the time. So is there a solution or is this one of those unsolvable mysteries we live with?

The solution lies in a multipronged approach and here is what we can do-

1. Build rational compensation systems.

Create compensation levels that are as rational as possible; pay increments, variable pay etc. on a logical basis.

The best way to build equitable or fair compensation is by ensuring internal equity (within the business, salary differentials are explainable by differences in responsibilities), external equity (paying on the basis of what others in the market pay), and by rewarding high performers.

Maintaining fair compensation also demands that we do not fall prey to pressures such as feeling that someone is precious and must be paid a lot higher than what his performance demands, or that some resource is critical and her exit will put a project in trouble. We may make adjustments in exceptional cases, but then who will ensure that exceptions do

not become a rule? And if we follow rule 4 below, we will not even have too many exceptions. If there are many persons remaining as “exceptional cases,” then the answer may lie outside compensation management, in manpower planning, in resorting to creative solutions and culture building. The message is loud and clear, if we encourage exceptions, we will get more of them!

2. Let employees know the logic behind their pay, as much as possible.

Create a transparent system. Transparency, however, does not mean that employees should know everyone’s salaries. But they should know the broad logic, or the philosophy as we call it, and know what they are entitled to and so on.

3. Keep communicating with employees as often as you can.

At the time of hiring them we need to explain the broad rationale of the salary, what comes monthly, what comes quarterly and so on; what are the deductions and what they might end up getting in hand. We are at times in a hurry and anxious to hire a candidate and so end up showing a cost-to-company (CTC) figure that is much higher than what they actually get in hand. They never see some part of the compensation ever (for example in some companies they never see the money allocated for superannuation in the CTC if they do not stay for 5 years). It is only fair to explain this discrepancy. We call it a case of super-built-up area and carpet area!

We also need to explain modification in sala-

Don't wait for the baby to cry. Pro-activeness helps employees see that there is a process that looks after their compensation.



ry structures and adjustments in the elements of compensation or benefits. Not everyone will agree with your philosophy, but when they start seeing the reason they will know that there is a method in the madness. Over a period of time, you will see the complaints for these reasons coming down.

4. Don't wait for the baby to cry. Pro-activeness helps employees see that there is a process that looks after their compensation.

If bosses and human resources teams could assure employees that their salaries are their (the boss' and HR's) job then we would effectively take compensation issues off the table and help employees focus on their deliverables. The most disastrous situation is where employees start believing that the only way to get a decent raise in this company is to show them an offer letter. If this is the culture, employees will always be on their toes and managers and the HR will always have guns pointing at their heads.

A typical situation where this fails is when a new person is hired at a salary considerably higher than other employees doing similar jobs. That is unfair to the existing employees and either we should have the pro-activeness and patience to look for candidates within our budgets, or if we can't find them, accept that the market salaries have moved up and mark up others' salaries at an appropriate time. No matter how confidential you may try to keep salaries, there are possibilities that other employees will know. Even if you are absolutely sure that nobody knows, well, you know that you are not doing justice and that should be a good enough reason to take corrective action. The trouble is that many times we do not know our own budgets and we are dependent on the candidates and worse, on recruiters in other companies, to define our

budgets.

All this is a lot of hard work, it takes time, but who said compensation management was easy? We look for shortcuts at our own peril, and only end up creating more work for ourselves. ●



Raj Aphale B Tech (Metallurgical Engg.)C' 83 is a consultant with a difference. Rather than throwing theories and jargons at his clients, he makes them aware of the "fundas" and then helps them make the right decisions. In that sense, he is not a prescriber, but really facilitates the discovery of the solution that is most appropriate. So the solution one gets is not the one given by the consultant, but one that is discovered and owned by the client team. This increases the chances of success in implementing the decision. The accompanied article demonstrates how Raj helps a client get back to the basics rather than impose theories on them. Check out his blog at <http://rajaphale.blogspot.in>

IITBAA Pune Chapter: The Photography Group

Milind Joshi & Gautam Naidu

The Photography Group of the Pune Chapter of the IITBAA was born from a discussion of an Executive Committee meeting in June 2011. The discussion was about participative activities that could bring alumni together, other than events that feature some high funda futuristic technical stuff (no disregard intended) or cocktails and dinners (again, no disregard intended). While these have proved to be instant draws for an average IITian, a need was felt to have more themes and backdrops where different cross sections of the alumni could gather and exchange ideas and, more importantly, do something about it. The activity was also thought of to attract a large population of IITians whose interests lay somewhere between serious conferences and complete freak-out parties. Although the Pune chapter has arguably been one of the most active across the country, we had begun to feel the need to make our activities more diverse and hence more inclusive.

After a lot of brainstorming (extended cack-session), we suggested that suggested that interest groups were the only way forward. It was felt that the alumni should have a genuine and innate interest (or even madness) that was beyond self-fulfillment, and which could actually drive a group of people from the state of indecision and hesitation to being committed and active believers. Sans this, the activity would simply die a soda-water-effervescence death.

The Photography Group thus came into being. Milind, an avid photographer since his B Tech days, and whose work has been displayed in professional exhibitions, took the lead in the group's formation. Feelers were sent out and were received with immediate and enthusiastic responses. The first meeting was held on July 2, 2011 and was attended by 16 alumni (including one who drove down from Mumbai!) -- a veritable record by any IITian's standards, especially given the fact that only tea, coffee and occasional biscuits were on offer! The meeting was held at the GS Lab head office in Pune, graciously provided by alumnus Shridhar Shukla.

The group drew up a plan to meet on the first Saturday of every month for discussions relating to photography (Theory: PG 101)

It was felt that the alumni should have a genuine and innate interest (or even madness) that was beyond self-fulfillment, and which could actually drive a group of people from the state of indecision and hesitation to being committed and active believers.



The experience also boosted the confidence of amateurs that given the necessary guidance and persistence, their work can get noticed. So much so that at least five more alumni / spouses have shown their interest to be associated with the group's activities.



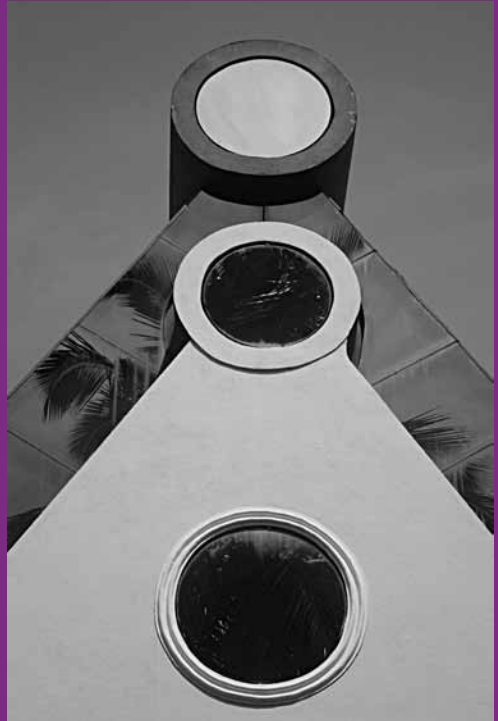
and plan outings (Practicals: PG 102) during the last weekend of each month. The group has met regularly every month since and has been to several outings, including two workshops conducted by Milind on the basics of photography and one on Photoshop software by a professional UI engineer.

Needless to say, as time passed, starting this activity proved to be several times easier than sustaining it over months. Participation has waxed and waned over time. Once again, what worked and is still working is the never-say-die attitude of a few core members, some vocal and articulate while others very silent but ardent supporters of the program. How else can you explain an IITian waking up at 5 am on a weekend morning and going to hitherto unexplored destinations to capture anything -- from morning moods to nature's infinite treasures. Plans for the future are ambitious and include involving alumni from other chapters and eventually making this a Pan IIT group. Barring the face to face meetings and the monthly outings, alumni from the world over can participate in information and photo sharing. The Pune chapter has set up a portal to facilitate this. All alumni who want to contribute to this portal can contact the Pune Chapter for access (<http://iitbaapune.in>). Automatic registration is cur-

rently not allowed.

As part of its first anniversary celebrations, the group recently organized an exhibition of photographs taken by the members over the year. The photographs covered a variety of subjects like landscapes, portraits, architecture, mystery, flora and fauna and rural milieu. There was quite a gratifying response from over 50 alumni, mainly invited over e-mails and through the word of mouth and many of them were accompanied by their wives and children, who came over on a weekend to understand and appreciate what their fellow brethren were up to. It was a completely different experience of IITians who, for a change, discussed art -- the very purpose of such an initiative. A caption contest was conducted, and drew an enthusiastic response from the visitors. Some gave a completely new meaning to the subjects on display, much to the surprise and amusement of the photographers themselves. The experience also boosted the confidence of amateurs that given the necessary guidance and persistence, their work can get noticed. So much so that at least five more alumni / spouses have shown their interest to be associated with the group's activities.

Buoyed by the initial success and encouragement received from all quarters, our next goal is to have a larger and more professional exhibition both in its contents and its organization. We also intend to include alumni photographers beyond Pune and indeed from across borders and to display their works at the event. Alumni world over can participate by getting in touch with Milind (mmjoshi@iitbombay.org) for further information on participation. Support from local chapters is sought to spread the word amongst their members. More the merrier! ●





Most people aspire to reach the very top in their life. But here is a man who has gone to the top and come down umpteen times. Yes, we are talking about ace mountaineer Vasant Vasant Limaye. No, we are not stammering here. That's his name. How he came about this name is a subject matter that is well narrated in the Madhouse book. For now, it will suffice to say that he was expectedly referred to as V-Square Limaye when he was not being called by his other nick-Balya. V-Square graduated in mountaineering engineering from IIT-B. Nobody, not even V-Square himself, is aware of what department he was assigned to. Believed to have graduated in 1978 with illustrious peers like Nandan Nilekani and Manohar Parrikar. He has Battled and survived avalanches, snowstorms and frostbites and led 12 Himalayan Expeditions including the first Indian Civil Expedition to Mt. Kanchangunga (28,208'). While scaling so many peaks he also has four virgin peaks named by him. Little wonder then, that he eventually made a career out of his passion and started training corporate honchos in endurance, Teamwork, Leadership Skills and outdoor activities and today is a pioneer of Outdoor

Management Development programmes in India. A multi-faceted personality who is an avid photographer who has recently unleashed the author within him. Above all, he still relishes the filterless Panama cigarettes

From High Places

Vasant Vasant Limaye

that he smoked in the H4 canteen and what's more, he even knows how to procure them. Noseybee coaxed our mountaineer extraordinaire to pen his story about his journey as an entrepreneur. His is a story that shows V-square where he has always belonged. Right at the top.....

Noseybee

For many mountaineering and associated outdoor activities are at once debilitating and dangerous, euphoric but expensive, only frivolously essential and economically useless, also totally without any redeeming social significance. My story stands as the antithesis of everything that is expressed in this conventional view point.

For me, in climbing there is always more than a metaphor, there is a means for discovery. My love affair with the mountains started long before I reached IIT Bombay. At IITB, after a few years of climbing in an out of the 2nd floor hostel bathroom to get to my room (You have to get a copy of H4 Madhouse to know more about that story) and some serious climbing expeditions under my belt: I finally graduated in 1978, more a mountaineer than an engineer.

Obviously, I wanted to continue with my passion but a month's vacation time in a year is completely inadequate for a serious climber with his sights set on making most of



the climbing season. It stands to reason that I went through multiple jobs in rapid succession!

Fortunately for me, I had started organising (with a few other friends) adventure camps for school children (8-14 years old) from the Mumbai, Pune and Thane region and surprisingly enough we managed to arrange trips to the hills for close to 1000 students in the first year itself!

This got me thinking about the outdoor experience and how it can be used for personal development. In those days there were hardly any options in India for further education in this field. I managed to enroll myself in a Teacher's diploma in outdoor education in Scotland although there was a lot of concern at home "ladka engineering karke yeh kya kar raha hai"!

I still remember, I had to raise about one lakh to finance my diploma degree and despite trying hard from various quarters I had failed. But failure too is an avenue for valuable lessons. Around the same time there was this meeting organized in Thane where someone I knew gave me a valuable lesson in life. He told me that "there are many people here. If you tell them about your requirement and

The wilderness is our classroom and the elements of nature such as rocks, rivers, forests and lakes are the tools.



requested everyone to donate Rs 1000, you could have substantial chumk right now". I was reticent to start with but decided to try it. I managed to get 25 of them to help which taught me a simple but valuable lesson in life. "You will never know unless you ask...what have you got to lose. At most people will just say no".

After my year long stint at Scotland all I had to show for was a membership in the Royal Geographic Society and a load of student loans to pay off. No choice but to push off to Saudi Arabia for a core engineering job! I knew the engineering degree at IITB was bound to come of handy at some point.

Around the same time I got together with some of my Brit friends to start an adventure company offering Himalayan expeditions and high altitude treks. Our clientele was primarily British but it was from here that the journey of "High Places UK began with four other British Partners.



This was also the time when I came back to India although I was still spending approximately three months a year in Great Britain, an arrangement that continued right up till 1992. In 1989 High Places conducted its first Outdoor based training programme in India was conducted for 7 days in the foot hills of Rajmaachi Fort near Lonavala for Bharat Petroleum.

This specialization that got seeded in 1989 triggered the formation of High Places in India as a separate identity from the erstwhile

“agar tu Adi Godrej hai to mai bhi V Square hoon, Tujhe bhi dekh lenge”



High Places based out of UK. I began with a bunch of keen, enthusiast outdoor people who took the risk to explore and expand the possibilities of outdoors for the Indian industry to benefit from. Today it is a team of more than 150 highly professional people

who specialize in Outdoors, Training & Facilitation, logistics and planning and strategy and design.

Today High Places is the pioneer and leading organization in the field of offering Outdoor based Management Development Programmes to most of the prime Organisations in India. We conduct more than 600 programmes in a year and have an annual turnover of 7 crores.

It is not the financial success that excites me but the thought of making a difference in people's perceptions and how they approach life. For the participants it means undertaking a sojourn of adventure, challenge and discovery enabling them to discover their inner strengths and resources, to recognise and dispel self-imposed limitations. They learn to work cohesively within a group for the benefit of all. At High Places "the wilderness is our classroom and the elements of nature such as rocks, rivers, forests and lakes are the tools." I do not mean to sound preachy but there are metaphors in nature and to reveal those to the average urban dweller while engaging with nature is an enduring joy. It makes you feel that you are doing something meaningful with people not in a teaching mode but in a process that facilitates learning.

In my years at High Places I have seen many Corporate head honchos coming off their high horses and completely being human! I particularly remember this one session with GODREJ which included Adi Godrej, Nadir Godrej and 8 of their Company CEO's. Initially there was some concern about the high profile nature of the assignment but I told myself that "agar tu Adi Godrej hai to mai bhi V Square hoon, Tujhe bhi dekh lenge" They get accustomed to limited amenities, having to take care of themselves and stretching yourself and going

beyond personal perceived limitations. And this is something that happens in sessions after sessions and many people walk away with a transformed outlook to live.

I hung up my mountaineering boots after 16 hardcore Himalayan expeditions. I belong to a conservative Maharashtrian family and there is one lesson that my father imparted which I remember particularly well. I was not a very studious student and in my 9th-standard I came 31st in class. I was shaking in my shoes when I had to show the report card to my strict disciplinarian father. Surprisingly he signed it and returned without a murmur and only one piece of advice. "If you want to be somebody in life you better knock out that 3 and keep only the rest".

It perhaps for this reason that I strive for excellence in all my endeavors. I have no hobbies, all interests turn out to become passions! I had collected a lot of photographs from my expeditions and wanted to share and archive them. I ended up by holding three photography exhibitions. I started writing (in Marathi), and after 5 long years of research, ended up with a novel which got published on 30th June this year. I have also been lucky enough to get the support of many good people in my life. And so the journey continues... ●

Vikram aur Vetaal

Satish Agnihotri

Translated from an original Hindi article by Satish Agnihotri which appeared in the 1980 Issue of Pragati

Background for those who don't know Vetaal stories:

Raja (king) Vikram would climb up a tree to get the corpse of some person down, and carry it on his shoulder to some place. During his walk, the vetaal (spirit) in the body would tell him a story, and then ask a question about the story.

The conditions for Vikram are:

1. if he speaks (breaks his silence), then the corpse returns to the top of the tree, and Vikram has to restart
2. if he knows the answer to Vetaal's question, he must answer otherwise his body will fall into pieces

High-Funda was determined. Patiently he got the dead body onto his shoulders from the roof of the main building (MB in IIT-B) and began climbing down the stairs. Vetaal said, "Hey High-Funda! I admire your perseverance, but sometimes I doubt your intentions. I wonder if, after capturing me, you would utilize me for the benefit of others or yourself. But I want to warn you up front. Do not use me for cogging (IIT slang for cheating in tests) in tests and quizzes. God will punish

you if you do that."

High-Funda listened quietly, just as he would listen to a professor preaching in the class about things not to do. Within his mind, however, he was thinking, "Let me first capture you buddy! Then I will make you write not only my home assignments, but also the home paper (thesis). For small small things such as cogging I am expert myself."

Vetaal continued, "You IITians are used to listening with a plain face. This reminds me of a story. I am telling it to you so that you don't get bored of walking. Listen carefully."

Raja (king) Bhoj was in his darbar as usual. As soon as the daily routine began, the minister notified that a representative of the Director of Bhartiya Takaniki Sansthan (IIT) wanted to speak to him. Raja granted the permission. The representative came in the darbar and bowed to raja Bhoj. Everybody in the darbar was surprised to see the four identical persons that followed him.

The representative said, "Rajan, I am here with a huge problem. The four samples standing in front of you are four distinct individuals, and not four xerox copies of the same person. Out of these, one is a UG meaning a B.Tech. student, one is a Research Scholar, one is an M.Tech student who has done his B.Tech. in IIT, and one is an M.Tech student who has done his B.E. outside somewhere. Their identical looks has caused tremendous confusion. Once the UG stole a name plate from the security department, and the poor freshie M.Tech. got punished. At another time, the Research Scholar collected the school for all four of them. Hence our Director feels that this would be a nice problem for the intelligent people in your darbar. Using non-destructive tests, you need to determine who is who. For your convenience we have marked their T-shirts with the letters A, B, C



and D. If you cannot decide who is who, then you will have to concede defeat, and pay 100 million Rupees to IIT in foreign currency.

Bhoj looked at his darbar. Everybody kept quiet. Bhoj said angrily, “What is this? Out of all these pandits, isn’t there anyone who can take this challenge? Is Dhara nagari full of fools except for Kalidas?” All darbaris still kept quiet.

Bhoj: “Mantri! Where is Kalidas?”

“Maharaj! He must be on his way,” the answer came.

Bhoj: “This Kalidas is getting late everyday lately.”

(Within his mind Bhoj thought Kalidas had become a head of the department.)

One of the pandits, Varahamihira, gathered his courage. He had done a short course of three weeks in IIT.

Varahamihira: “May I try, your Majesty?”

Bhoj: “Surely! Surely!”

Varahamihira invited the Gaali-Pandits to the

darbar, and whispered some instructions in their ears. A, B, C and D stood in a row, and Varahamihira ordered, “Get set! Go!” Immediately, Gaali-Pandits began saying obnoxious gaalis (foul words). All the darbaris were stunned. One after one, they began stuffing their ears with their fingers. Bhoj himself stuffed his ears, because he could not stand the disgusting language. Varahamihira was watching the four carefully. He thought, at least the freshie M.Tech. will express resentment. But the IITians showed no expressions. These routine gaalis were all too familiar to them in the hostels. After the Gaali-Pandits were done, Varahamihira was looking down with shame. He tried saying something to Bhoj. But Bhoj looked at his hung face, and said, “Pandit! This is a matter for Kalidas only. So don’t worry about it.”

Varahamihira did not lose heart altogether. He said, “Maharaj! Let me try only one more time. I am confident that I will identify at least one of them.”

Bhoj: “OK! But this is the last chance.”

Varahamihira sent a man with some instruc-

tions. The darbaris waited curiously for what was to follow. In the meanwhile Kalidas entered. Just like an IITian's face blooms when he gets an intro with a non-IITian girl, Bhoj's face bloomed with delight when he saw Kalidas coming. Kalidas also understood the matter as soon as he saw the IIT representative with the four identical students with their Mood-Indigo T-shirts. Kalidas went and sat right next to Bhoj and began discussing the matter.

Varahamihira's man came back with four staff members from the jail. They had four dishes of food from jail. Varahamihira ordered the four students to eat that food. The darbaris and Bhoj himself felt bad to see the guests eating the food meant for prisoners. Some soft hearted ladies had tears in their eyes. But Varahamihira was quiet. He was certain that he will see different reactions for the food. The freshie M.Tech. adjusted himself for the gaalis, but he would surely complain about the food. And the one who eats without cribbing (complaining) must be the UG. Then I can think of distinguishing between the other two. He began dreaming about defeating Kalidas.

Alas! The four IITians ate the food without any complaints and regrets.

Varahamihira was puzzled. He asked them in a stuttering voice, "How was the food?" And a unanimous answer came, "Just like the food in our mess!"

The darbar was filled with a huge laughter. The insulted Varahamihira walked out of the darbar, and never showed his face again in Dharanagari.

Some people say that he joined IIT. Some say he joined some psychiatric ward. Although, those who know, know that these are equivalent things. Now Kalidas had the responsibility to save Bhoj's face. Kalidas was calm

and composed. He said in a confident tone, "Maharaj! I believe that I will be able to take this challenge. But I will need some ten days to do this." Bhoj gladly agreed.

Kalidas arranged for the four students to stay in the splendid guest house. He had his spies ready to watch the four. He said to the students, "See, today is Monday. Next Monday I will give you all a test at 9:30 AM. Good bye until then."

On Sunday night Kalidas got the report from his spies.

1. A began mugging (studying) right on Monday night. B, C and D relaxed.

2. B, C and D went to see a movie on Friday night. It seemed that without the movie, they were feeling pretty restless. In the cinema hall they kept making a lot of noise during the film. After the show they ran to the guest house and jumped to the food. They were excited to see dry dinner (sandwiches and milk shake). A continued with his mugging.

3. On Saturday B began browsing through his notes. After dinner, however, he played bridge. He looks like an expert bridge player. A kept on mugging. C and D were enjoying themselves.

4. B, C and D were watching TV or playing carom for most of the day on Sunday. B studied for one hour in the afternoon. After news at 10:10PM they returned to their rooms. B went to bed. C and D began studying for the first time. A continued mugging.

Kalidas ordered to watch C and D more carefully. On Monday evening, he received another report and the results of the test.

1. A was reading during his breakfast.

2. B had stopped his studies on Sunday night, and seemed without any tension.

3. C and D were reading throughout the night. They came late to the breakfast table. They hurried through the breakfast and rushed to the examination hall. They had cog-sheets in their pockets.

Test results were: A and B got a 'C' grade, and C and D got a 'B' grade.

Kalidas had mixed expressions of relief and puzzlement. He had recognized A and B, but could not yet distinguish between C and D. He had to solve the problem by Wednesday. He went back to his room, and thought for about three to four hours. When he came out of the room, he was happy. He gave a few more instructions to his spies.

The next day yet another report was waiting on his desk. The report was, "This morning C and D were strolling through the lawn. I went to C and said what you wanted me to say into his ear. He just smiled. When I said the same thing to D, he got angry and hit me."

Kalidas had got his answer. The darbar was full the next day. Everybody was wondering if Kalidas would succeed this time. Bhoj was also concerned. Kalidas came with the IITians at the right time. After seeking Bhoj's permission, he announced, "A is the freshie M.Tech. who did his B.E. outside of IIT. B is the Research Scholar. C is the UG B.Tech. student and D is the M.Tech. student who did his B.Tech.in IIT."

Bhoj looked at the representative of IIT. He was looking down with a quiet face. Bhoj: "Does your silence mean that Kalidas is right?"

Rep: "Yes!"

The darbaris applauded. Bhoj hugged Kalidas.

After narrating the story, Vetaal asked, "Hey

High-Funda! What logic did Kalidas use to reach the right answers? You probably know the answer, and if you try to avoid answering intentionally, then your body will fall into thousands of pieces and they will fall into the ditch dug under the name of the swimming pool."

High-Funda took a deep breath and said, "Vetaal! I knew that you will ask me such a sidey question. So listen. Although A adjusted himself for gaalis and food, he could not escape the tension of a test. That is why, after all his mugging, he got only a 'C' grade.

B's limited mugging was natural, because to keep his school, all he needs is a 6.0 CPI (GPA of 6 out of 10), and needs no more. So he utilized his time effectively in playing bridge, and got a comfortable 'C' grade.

Despite all the activities of C and D, they got a 'B' grade. Thus it is clear that they are good old sinners of IIT, and are expert in cogging and techniques of taking tests. The only problem was to distinguish between the two. So Kalidas applied Varahamihira's technique in a different form. When his spy said a certain thing to C he smiled, but D could not stand it, and hit the spy. Clearly, there is only one such gaali, and that was "PG m***d." Therefore, C was the UG."

"Very good!" Vetaal said. But High-Funda's silence was broken. So Vetaal escaped and flew back to the roof of the main building. High-Funda cursed, and returned to his hostel. He had to prepare cog sheets for the test the next day.

And people say IITians are modest. ●

Reddy-made Cement

Madhu Reddy

Tirupati to Bombay: a journey that laid the foundation for a later-day longer journey as an entrepreneur. From watching people pouring out like sardines from fishing nets at Churchgate Railway station, to finally reaching the IIT campus at Powai, I felt that I had travelled from a mad melee to a quiet haven. I knew that I had embarked on a beautiful journey which would take me places. Literally so, as it turned out later.

I was not sure what to do with a three year course called MSc (Applied Geology) in Civil Engineering that combined courses from Civil, Metallurgical and Chemical streams. I completed it in 1974, but I was reluctant to leave the campus. IIT and my H9 had grown on me and I stayed for another year to do research, until I realized that I needed to finally move on. This decision took me to ACC Ltd in 1975 in their Consultancy and Expansion division. ACC's cement factories are spread all over India and my work took me on a Bharat Darshan for 3 years. I cannot think of a single state or a union territory of India that I did not traverse then.

Later, I joined the Cement Research Institute, New Delhi as a scientist and enriched myself with cement technology jargon and had papers published that made me feel like a Nobel Laureate. However, this notion was short-lived. A senior told me that you may put any muck in the cement kiln and what comes out

A senior told me that you may put any muck in the cement kiln and what comes out can be passed off as cement.



can be passed off as cement. This 5-year stint was succeeded by a brief one year haul at an oil company in Canada. But I was too rooted in India and the motherland beckoned me back.

Hyderabad was my city-in-law, my wife's hometown and the city of my destiny. A long stint with the cement industry encouraged me to test my entrepreneurial dreams by foraying into construction and cement manufacturing. The current telecom secretary was my hostel mate and he introduced me to my batch mate from Hyderabad. We forged a partnership that eventually led to the creation of Banjara Construction Company and Banjara Cements Ltd. Somewhere along the way, IIT seemed to have instilled some ambitious entrepreneurial dreams that were tempered with some altruistic motives. Banjara Construction Company focussed on providing middle income housing although there was more money to be made by catering to the higher end segments. After 36 successful ventures spread out over Hyderabad and Secunderabad, I now carry a smile of a



job well-done. So also with Banjara Cements. Limestone deposits abounded barely 100 km from Hyderabad, which would have been an ideal and convenient location for my cement plant. Then again, my entrepreneurial zeal was peppered by a 'good citizen' mindset that induced me to move further interiors, to a backward place called Tadipatri 350 km from Hyderabad.

Along with success and satisfaction, there is always an itch to do something more and unique. The year 1991 saw me trying to satisfy my itch and I started an airline called VIF Airways with another friend. This was again fuelled by some more altruistic intentions to connect smaller towns with air travel and eschewing the urge to profit from plying on more lucrative sectors. This was clearly an idea before its time. Like other private airlines of those times viz. East West, NEPC, Damania et al, our dream too crash-landed in 1996, but we emerged richer with the experience. Somewhere along the way, I dabbled in more ideas that were again much before their time. Environmental friendly alternate energy

sources like wind power, municipal waste, mini hydel projects etc. could have taken off had the Government given suitable subsidies and the appropriate unit rate for the power as they do today. While I look back with a lot of satisfaction at what I had achieved, I feel more satisfied that my retirement at the age of 55, made possible by my daughter and son settling down. I have now moved into a payback mode. I pay back my society by presiding over a society of three colonies in Jubilee Hills in an effort to make it the best

Environmental friendly
alternate energy sources
like wind power, municipal
waste, mini hydel projects etc.
could have taken off had the
Government given suitable
subsidies and the appropriate
unit rate for the power as they
do today.





in Hyderabad. I pay back my alma mater by co-chairing the Hyderabad Chapter of IITBAA and participating in all its events and programs. I also patronize art and artists by providing them an appropriate venue to house an art gallery, art library and children workshop area, not to mention the 200+ paintings from my collection.

If I were to sum up my journey in a nutshell, I would say that the memories are fond, satisfaction levels are high, my heart wells with pride. But as Robert Frost said, “I have miles to go before I sleep.” ●



Madhu Reddy

Madhu Reddy M.Sc. (Applied Geology) C'74 did his schooling in Madanapalle and graduated from University College, Tirupati before coming to IIT Bombay to join the Civil engineering department for a M.Sc in Applied Geology. Having worked in India and Canada, Madhu became a first generation entrepreneur to set up a cement factory in A.P. He has completed 36 real estate projects in Hyderabad and Secunderabad and ran VIF Air ways, an airline company in the nineties. Having retired from main stream business, Madhu now pursues interests in stock market investing, art, community activities, traveling, etc.

Teesri Panama : 1982

In the last issue of Fundamatics, Fundabees had shared a sample anecdote with alumni while soliciting anecdotes for 'Hos-tales'. When Sreekumar N (from Prayas, Pune) shared the same story with friends and relatives in his village, what eventually emerged was an afterword to our original tale. Jumble bee liked the idea of such creative re-engineering between people of not just different time spans but different geographical locations so much, that he insisted that both should together form a part of this issue of Fundamatics. Bankers, school teachers and high school students have all contributed to this. Enjoy.

Stumblebee

During our times, the price of Panama cigarettes in the canteen used to be 8 paise for one, 15p for two and 20p for three. Our friend Tongaonkar from H3 aka Tonya used to go the canteen, put 5p on the counter and tell the canteen boy, "Woh teesra panama de" (Give me the 3rd Panama). This story has a sequel. The canteen boy wised up to Tonya's antics and told him flatly that since he was buying just one, he had to pay 8p. The wiser-than-canteen-boy Tonya then bought 3 cigs for 20p and told the canteen boy that he was returning 2. Will the boy please refund 15p? It took the canteen boy a whole semester to figure out how he was

getting "panama-ed" by Tonya.

After-ward: March 2012

This is a dialogue between the canteen man - CM and the student regarding sale of cigarette. The dialogue starts after the student takes 3 cigarettes from the CM for 20 paise.

Student: Hey, now take these 2 cigarettes back and give me 15 paise

CM: Are you selling 2 cigarettes to me? If you are selling, my buying price is not 15 paise for 2; it is 6 paise per piece. So I shall give you 12 paise for 2 cigarettes.

Student: No man, I am not selling. I am returning the goods. It is called a sales return (grins).

CM: Oh; if you are returning the goods because they are defective, I shall replace them with another 2 cigarettes. Alternatively, you can cancel the transaction by returning all the pieces you took from me and I shall return your 20 paise.

Student: I don't want to cancel the transaction; I want to return only 2 cigarettes. Please return its cost to me.

CM: OK, you being a regular customer I shall make an exception. You took 3 cigarettes from me for 20 paise. That is about 6.5 paise per cigarette. If you are returning 2 of them, I should be paying you 13 paise. Since I do not have 1 paise now, I can give you 12 paise. Do you want to do this transaction? ●

*Sreekumar N
B Tech, 1984 Elec. Engg*

Dhobi Offices And Dark Rooms

IITB In The '60s

Sailesh Kapadia

- Before 1963, there were only three ladies among all postgraduates in sciences. There were three engineering undergraduates in the batch of '68, which started in 1963. This doubled the size of the female students' contingent at Powai, and they all lived in an apartment meant for staff members.
- There was supposed to be a roll call in each class and those who missed a class had their name put on the notice board in the main floor of the Main Building and each was assessed a fine of Rupee one. In those days this was a significant amount as the typical mess bills were Rupees sixty-five a month. Over time they rose to about Rupees eighty-five a month by 1968, when the batch that began in 1963 graduated.
- There used to be a rule called RB-7, which stipulated that students who failed in the first year were automatically dismissed from IIT. At the end of 1963-4 class year, this was replaced by RB-8, which was already in existence. RB-8 said that anyone who failed twice in the same class year was dismissed from IIT. There was an instance of someone in third year who failed twice and was dismissed and had to start from the bottom at the University of Bombay to get a bachelor's degree.
- There was no visiting between the ladies and men's hostels other than for socials in

the day time etc and all the ladies stayed in public areas.

- The only way out of the campus in 1963-65 was on an IIT bus, which ran from the Chemical Engineering Department to Vikhroli. If one was coming to the campus and missed the last bus (10 PM) from Vikhroli, the only option was a (very expensive) cab. The Andheri-Kurla bus route going via IIT was started in 1966. Now people living on the Western Railway could go by

There was no visiting between the ladies and men's hostels other than for socials in the day time etc and all the ladies stayed in public areas.



bus to Andheri and catch a train from there instead of going to Dadar and changing trains.

- Brigadier Bose, who was the Director, thought that too many people were going to the city on weekends. So he changed the weekend to half-day off on Saturday and half day off on Wednesday for First and Second Year students. Despite that many people continued to disappear on weekends
- Non-veg was served once a week and sweet dishes (desserts) twice a week.
- Other than snacks in the canteens in the Hostels, the cafeteria near the Main Building and a couple of shaky places in Y-Point were the only sources of food.
- There was a one-rupee charge added to everyone's mess bill for "Hostel Fund". This money was used to subsidize food costs for some impoverished students whose families could not afford the mess bills. These students also had free tuition and Hostel

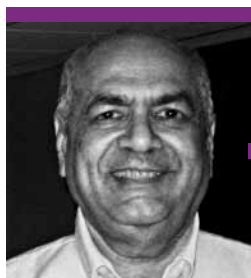
rent based on their financial needs. In addition they also got a monthly stipend named Merit cum Means scholarships to help with their incidental book and other expenses.

- Most students had a clothesline in their hostel room where they dried underwear (which they washed daily when taking a shower). Some also washed their own shirts and slacks, as the dhoti was expensive for them. The reason for this is that some years ago I had written to the Student Secretary of Hostel 5 some years ago to ascertain that the Hostel had received a donation, which I had sent through the IIT Heritage Fund. (I later learned that apparently the money was combined with other funds for some construction project in the hostel). The response I received was that there was ONLY ONE WASHING MACHINE in the Hostel and it would be more convenient to have an additional washing machine!
- Someone mentioned overcrowding in the hostels in one of the articles. Well we now have people doing undergraduate in many more than the five original engineering subjects. We used to have 50 in each class for each of the five engineering departments. I understand the number of PG's has also risen dramatically.
- There were always sightings of snakes in the early sixties and many people (who could afford them) bought knee-high gumboots to wear in the rainy season.
- The formal IIT uniform was white shirt, white slacks, tricolor striped tie from Handloom house (red, silver and blue diagonal stripes) and a blue blazer.
- Hostels had predominant members of a certain batch, which joined in the year the Hostels were built. Hostel 7 had predominantly people who entered in 1963 (and graduated in 1968); Hostel 8 had predomi-

nantly people who entered in 1970 (and graduated in 1975) etc. Initially in 1963 Hostels 1 and 2 were reserved for PG's. But then a whole bunch of people who joined in 1964 were admitted to Hostel 2. Hostel 6 was considered the rowdiest (being the furthest from the Main building and other traffic as only people from Hostel 6 went that far on that road) though I hear that there are others that have taken that mantle.

- Inter-IIT competitions were suspended in 1964 due to the "Emergency" from the China war. They resumed in Decembers 1965 at Madras, 1966 at Bombay and 1967 at Delhi.

To be continued in the next Issue



Sailesh Kapadia

Sailesh Kapadia, is now retired, graduated with a B. Tech in Mechanical

Engineering in 1968 and lived in Hostel 5. After graduating, he went to the US and got MSME and an MBA and worked for a number of companies in various capacities and consulted as a Six Sigma Black Belt and ISO Auditor for the last decade and a half. He started the Pittsburgh Chapter of the IITB Alumni Association a decade ago and still helps the current Chair of the Chapter, Kalpesh Upadhye. He has always been willing to help students and visitors from IIT-B who go to the various Universities in Pittsburgh.



This one is at a function in Lecture Theatre around 1964. Seated in the first row from RIGHT to LEFT: Me, Prof. TR Sarkari (first Head of Mechanical Engineering department), Mrs. Sarkari, Mrs. Malik (wife of Prof. AK Malik, Metallurgy department), Brig SK Bose (first Director of IITB), Junior Malik, Prof. AK Malik, Prof. A Jagannmohan (first Warden of Hostel 5), and others whom I cannot identify.

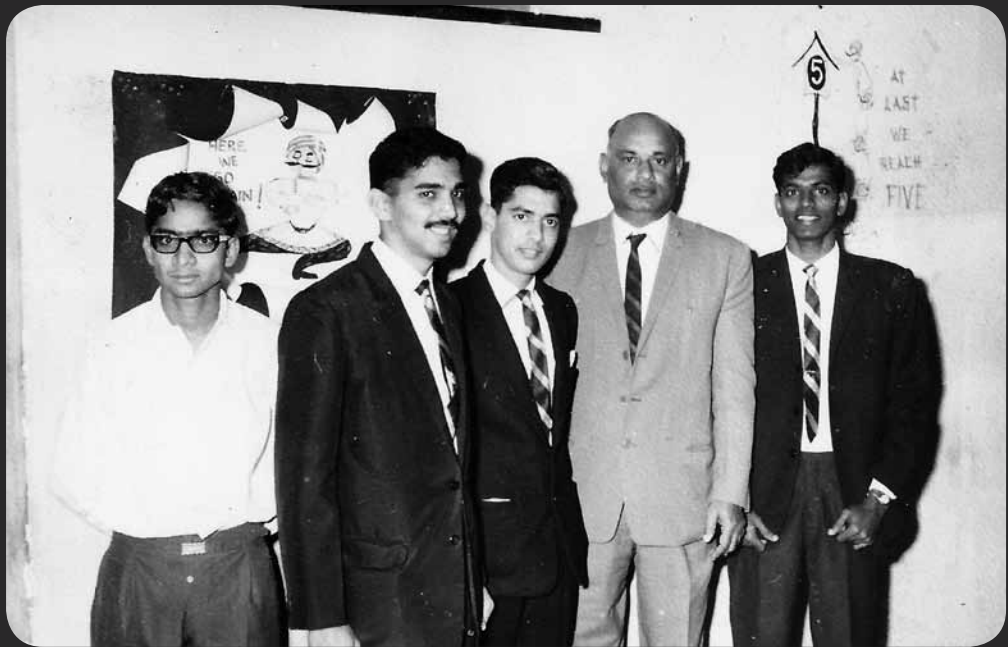


Attached is a picture taken at the first meeting of the Mechanical Engineering Association in the Lecture Theatre in October-November 1967. The MEA was started by Prof. AK De, who was the Head of the Mechanical Engineering department at that time (the two preceding him were Prof. TR Sarkari and Prof. BB Parulekar). I do not know if the MEA continued to exist after Prof De's departure from the Mechanical Engineering department, when he became the Director.

The speaker at the function was Mr. Nanjunday who was the Chairman of Synthetic and Art Silk Mills' Research Association (at whose premises the first group of IIT students had classes before the campus was built).

The people seated in the first row from RIGHT to LEFT:

Prof. AK De, Head of Mechanical Engineering department, Mr. Nanjunday, Chair of Synthetic and Art Silk Mills' Research Association (SASMIRA), Sailesh Kapadia, Secretary of MEA.



Here is another picture from the past at a Hostel 5 function. Standing from LEFT to RIGHT:

Mr. Ravindra Dbingra (B.Tech., 1966), Garden Secretary; Vinay Pandit (B. Tech., 1967), Gen. Secretary; Sailesh Kapadia (B. Tech., 1968), Social Secretary; Brig. SK Bose, Director; and name-not-remembered (B. Tech., 1967).



Here is a picture of the IITB Gymnastics team from Inter-IIT at Bombay in December 1966. From LEFT to RIGHT:

First Row (crouching): Avinash Kulkarni (Civil Engg., 1967, H-5), Sailesh Kapadia (Mech. Engg., 1968, H-5)

Second Row (seated): Pritam Singh ('PT Singh') Gymkhana Supervisor and Sergeant-Major from Brig. Bose's army days, K. Khatri (Gymnastic Coach and Sergeant from Brig. Bose's army days), Sports Secretary (Civil Engg., 1966, H-6)

Third Row (standing): DD Karandikar (Civil Engg., 1967, H-5), Kotwal (Civil Engg., 1969, H-3), SK Das (Metal-lurgical Engg., 1969, H-5)

Fourth Row (standing): Two gardeners from Gymkhana. Their names are unknown but they worked under Khatri.

The Humor Beings

Nitin Gupta

With IIT it was a love cum arranged marriage. My parents introduced me to this girl called JEE, belonging to the Engineering caste. I fell in love during the initial dates with the course at the coaching institute. And tied the knot in 2002 in IIT Mumbai campus.

Unlike other marriages, there was no honeymoon. Because there weren't too many girls. If love is food for the soul, being in IIT felt quite like being a nomad. Always on the run, to HN, or Hostel -10. By the third year, I started dating my GRE book, I would take her to CCD and Barista. I liked her, and who won't, I mean a woman who could be read!! Quite literally.

I wasn't fond of her, but it was better than hanging out with the course books. It was a relationship without a spark. One evening I had a had a violent argument with my inner self and decided to break up all informal ties with Engineering. I didn't have any other friend, or support system. In short I was alone. So I went to the Library to think, because that's where the AC was. Just to confirm that's it was genuine anger and not just the weather. I sat there thinking and decided not to do anything for the rest of my life. I felt betrayed by the false fantasy that was created around IIT. It felt like being in a Yash Chopra film. You know it's a lie but you are stuck. I realized may be I don't belong to this genre, may be I belong to Anurag Kashyap genre..

After a few drinks somebody from the back said, Nitin, I wish I could crack jokes likes you.

I was like, Dude you are a banker, you guys have made a joke of the whole economy. Isn't that funny enough for you



I wanted to talk about these issues, so I started doing Stand Up comedy.

But there was a small problem: Nobody knew what Stand Up comedy was, so when we used to pitch for shows, people always asked us, What is stand up comedy?

It's hasya kavi sammelan in English.

And enamoured as Indians are with English. I sometimes think our first few shows had more to do with English than stand ups.

The other interesting part about the business was that, nobody wanted to pay for it. We would get calls from corporates, Nitin, we love your work, but we don't have much money. And initially I used to get angry at this treatment, then one day I realized, Hang on, I am a stand up comic, where is my sense of humor?

So I agreed to do that free show, It was a big

corporate show in a bank. And said, “So this is my first ever paid performance of my life. I have paid for my travel, paid for my stay and apparently even for your bailout!

After a few drinks somebody from the back said, Nitin, I wish I could crack jokes likes you.

I was like, Dude you are a banker, you guys have made a joke of the whole economy. Isn't that funny enough for you

English kitni rakhni hai?
Depends how drunk they are.
Jyyada drunk hai to, you can
do total English also.



This got a huge applause. And they called me again for another show, which was a paid show

The other funny thing we experienced in the initial stages was the legislation of the content. In the college shows because there are professors sitting, fest organizers would politely convey that, Sir please don't crack any double meaning jokes.

Which was funny because one, we don't do such stuff and secondly, agar aapke Prof's itne hi sharif hain to unhe samajh hi nahin aayenge.

More than the shows, it's the requests that are funny.

One day we get a call for a corporate show in Punjab. They said, Sir we want a Hinglish show. More of hindi.

English kitni rakhni hai?

Depends how drunk they are. Jyyada drunk hai to, you can do total English also.

We started in October 2009, the initial 2

years were very tough. But maybe the insight learned was to have a sense of humor and not take yourself too seriously.

We believe, like mathematics is the language of nature, comedy is the language of truth. I see myself doing the same even 5 years ahead.

You can check out some of our work at www.youtube.com/TheHumorBeings.

And also at www.humorbeings.in ●



Nitin Gupta aka Rivaldo is a Chemical Engineer from IIT Bombay, presently CEO, (Chief Entertainment Officer), Entertainment Engineers. A comedy company he founded with the vision of making stand up comedy respectable in India. In the last 2 years EE has performed 100 Live shows across IIT's, NIT's, IIM's, their Alumni Meets, Corporate Shows in IT Giants to Financial Conglomerates. Guest Speaker at various E- Cell Platforms and Marketing Conclaves. A TED Favorite, having 25 TEDx'es to his credit already. He is widely considered as the most Original Orators and Stand Up Comic of Present times.

A “Swasth” model for Affordable Healthcare in India

It is a well established fact that poverty in India cannot be overcome without dramatically expanding and improving access to and quality of public education, health, water and sanitation. Yet more than 65% of the population in India does not have access to essential medicines. The Indian government spends only around 4% of their total GDP towards healthcare. Annually, about 20 million people in India go below poverty line due to a health shocks. Many end up taking a high interest loan and getting into a debt trap. Given the size of our population and the complexity of our healthcare problems, the goal of universal health for all can only be reached by incorporating innovative approaches to health care in India.

Swasth India is one such unique innovative model that aims to provide quality affordable healthcare to the poorest of poor in Mumbai’s slum areas. Founded by IITB grads Ankur Pegu and Sundeep Kapila, Swasth India is a 4 year old start up with a team of 35 employees that runs a chain of 6 clinics in the Goregaon, Kandivli region. In addition there is a seventh mobile Swasth clinic that reaches out to 4 high intensity areas twice a week and 4 more low intensity areas once a week near the Aarey colony and nearby regions.

Their model is based on pilots run at a number of rural locations in Maharashtra,

In a short span of one year they have grown to seven clinics with more than 9600 families registered with them and more than 20,000 health visits between them. The customer savings for every Swasth consumer is a whopping 65%.



urban Bangalore, Delhi and Haryana. In a short span of one year they have grown to seven clinics with more than 9600 families registered with them and more than 20,000 health visits between them. The customer savings for every Swasth consumer is a whopping 65%. And the social return, an astronomical 135%

How did it all start?

Both Ankur and Sundeep studied at IIT Bombay (2002). While studying at IIT Bombay, both were involved in various entrepreneurial activities through campus startups. That was where the entrepreneur in both Ankur and Sundeep was born. Ankur did start out his professional career with a prominent telecommunications player while Sundeep spent six years with the Indian arm of McKinsey & Co, specialising in the Healthcare and Development sectors. Triggered by a discus-



sion on a weekend with his old friend Ankur, Sundeep put down his papers at his work to start their first new venture – to provide the backend for delivery of healthcare service to care for the needy, to do good to the society, to start Swasth India.

“Swasth” means “good health” and the model of Swasth India revolves around two key insights. For economically poorer households who seek local solutions to their everyday health issues. Saving time in their case is tantamount to not losing out on daily wages and for this, they are willing to go to the nearest chemist, health service provider and even the neighbourhood quacks to address their family’s health needs. The Swasth team decided very early on to set up clinics at the heart of localities usually in the local market area to ensure quick and easy accessibility and encouraging walk-in customers.

In addition health costs for these households are driven up because the different stages of healthcare delivery, consultation, diagnostic tests, delivery of medicines etc are not integrated. Each stage independently incurs logistics costs, upkeep and retains its own profit margins resulting in increased expenses that a patient has to bear. By integrating all

the stages under one roof, the Swasth model by providing end-to-end healthcare solutions not only goes beyond the standard doctors visit and prescription but is actually able to reduce the cost of every visit to the Doctor by 30- 50%.

Walk into a Swasth Clinic and it is small (200-300 sq.ft) but squeaky, clean and patient friendly. Space is optimally used with a front desk, waiting area, doctor’s consulta-

The Swasth model by providing end-to-end healthcare solutions not only goes beyond the standard doctors visit and prescription but is actually able to reduce the cost of every visit to the Doctor by 30- 50%.



tion area as well as two beds. Every first time patient is given a membership number and an identity card free of cost which entitles them to access discounted rates. Each center has a doctor, a nurse and a receptionist. After a consultation, patients are assisted by the nurse for routine diagnostic tests (when required) or medicines from the in-house pharmacy. More advance tests are conducted at a centralized location which has its own pathological lab.

The receptionist maintains a step by step case history of every patient in a predesigned format in a centralised database. Twice in the day, an open source MIS takes the daily data and generates a report that helps in culling new learning and helps in making processes more streamlined and efficient. This web based Health EMR (Electronic Medical Records) called “Swasth Live” is built on



LAMP (Linux Apache MySQL PHP) which was developed in-house and is currently operational on more than 100,000 records.

The cost of medication is often cut down by half by directly procuring from pharma companies and cutting out the middlemen. The team is also working directly with insurance companies and select hospitals to provide insurance schemes that will help prevent low income families from falling into the debt trap due to health shocks. There is attempt at preventive care and health workers visit the neighborhood regularly.

Swasth health mela and camps are conducted in schools and other locations and they have recently started a clean drinking water initiative. All in all, the Swasth approach to health is integrated and holistic and the customers are quick to realize the vast difference in prices as well as quality of health delivery and almost always become regulars who come back for health needs of all family members.

The fixed cost of setting up each centre is around Rs. 3-4 lakhs and coupled with Rs 70-80 thousand monthly operational cost and salaries of management staff and other overheads. Yet with a lean and efficient

system in place, centers are already breaking even and the model is well on its way to sustainability.

The Swasth model has already succeeded in driving down costs for the community it seeks to serve. As a young social enterprise, it is eager to experiment, fail, learn and then grow rapidly. When we met the two young entrepreneurs they were at pains to explain that the account should spotlight the initiative and not the individuals as they are keen to spread the word about their model and break the unholy nexus that exists in the current health ecosystem in India.

Swasth India was a revelation and such was our admiration that we broke form and acceded to their request. This is truly an enterprise destined for greatness. ●

Cashless Campus

Poorna Chandra

Imagine living a life without ever needing to carry a wallet. Cards allow us some freedom but there are many places where there is little recourse but for cash or coin. How many times have we heard that oft repeated refrain of ‘chutta nahi hai kya?’ followed by the futile scrounging around in pockets and purses. Then there is the sudden need to rush to the nearest ATM machine. Now imagine a scenario where all those everyday aggravations are gone. Sounds like flights of fancy from a disgruntled mind?

Well, not for students at IIT Bombay where a radical new innovation is at the cusp of being tested out amongst students. In what is to be a pioneering project in India, Cashless Campus is an initiative that is being coordinated by IIT Bombay students in association with NPCI (National Payment Corporation of India), Canara Bank and ItzCash.

A team under guidance of Prof Ashish Das and led by Poorna Chandra and Abhijeet Mukhekar, both students of IIT Bombay, has been working their socks off for implementing the scheme.

The technology used will be NFC (Near Field Communication) for contactless money transfer, where a tag is stuck to a mobile or any other personal belonging commonly used/kept in the pocket, and can be used for instant payments with just a tap. This tag

The technology used will be NFC (Near Field Communication) for contactless money transfer, where a tag is stuck to a mobile or any other personal belonging commonly used/kept in the pocket, and can be used for instant payments with just a tap.



contains the user's data, and will serve as a reloadable prepaid e-purse, and must be tapped against a terminal for a transaction to occur. The tag will be directly linked to users' bank account to help load money via net banking.

These terminals will be installed in various hostel shops and cafeterias in the campus, and will thus provide a perfect environment for testing the effectiveness of this new concept, and whether it can be put to mass usage across our country. This new technology also has the potential to replace magnetic swipe cards, and has already been implemented in countries like Norway and Taiwan.

This system will not only increase market awareness for the technology, but will also be cost-effective and save time. Students and em-



CASHLESSCAMPUS

If implemented on a nationwide level, an NFC setup will help India save nearly Rs 3,000 crores spent in printing small denomination money.



employees will be relieved from long queues and the want of loose change, whereas merchants can also save on cash handling and operational costs. The system is easy to use and the payment and authentication is in real-time. Online recharge facility and attractive offers are an added bonus.

NFC may still be in its infancy in India, but offers immense potential especially in the field of microfinance. Card payment does not allow transactions unless they are above a certain amount, whereas this new technology allows even payments of a rupee. The RBI has said that printing notes of smaller de-

nominations is costlier and the Government spends nearly one rupee to print a Rs 10 currency note. If implemented on a nationwide level, an NFC setup will help India save nearly Rs 3,000 crores spent in printing small denomination money.

With worldwide NFC transactions expected to surpass 1.2 billion by 2015, even RBI's working group recognized contactless money transfer as one of the most promising innovations of recent times. Interactions with major banks have painted a bright future for NFC, with a lot of potential in low value daily payments, transit and toll fares. NFC technology is not only restricted to payments but also for secondary applications like identification, access and data transfer.

One of the main motives of the project is to create an entire network where quick and easy payments can be made throughout India, and although this may take a few years, this pilot project is one of the most important stepping stones on the path to success.

As for IIT Bombay, this is yet another example of an enabling environment that encourages innovation, and we are proud to have IIT-B as the first campus in India to be associated with this new radical innovation. ●



Butterfly Fields

Sharat Chandra

The idea for Butterfly Fields first came with the realization that our current education system offers no scope for experiential learning. The learning was with just a view to crack an exam; students never really thought whether they wanted to study those subjects or not.

Just out of IIM Ahmedabad, my classmate Praveen and I decided to change this – by starting something that offered experiential learning by engaging kids on weekends and during their summer breaks. That is how Butterfly Fields was born and it was our way of contributing something to society.

First, something about me. I grew up in Nagpur and joined IIT Bombay to pursue Chemical Engineering. After that, I worked for a couple of years with a consulting company. Consulting required one to advise others and I always asked myself – was I in a position to advise others without really experiencing anything myself? I wanted to be closer to the ground reality so I started to look for other options. I cracked CAT and got through IIM Ahmedabad.

Post IIM-A, I was battling between taking up a job and starting something on my own. My family was worried because I had no concrete plans. I was not extraordinarily creative; I was just an average guy. Having worked in a company earlier, the glamour of the corporate world did not attract me. It seemed

Just out of IIM Ahmedabad, my classmate Praveen and I decided to change this – by starting something that offered experiential learning by engaging kids on weekends and during their summer breaks. That is how Butterfly Fields was born and it was our way of contributing something to society.



pretty romantic back then when I dreamt of starting something on my own and employing a hundred people.

So I made an excel sheet of 20 ideas. When I was doing this I was fortunate to have with me Praveen, who was an aeronautical engineer from IIT Madras with no prior experience. We brainstormed over an initial set of ideas, which included stuff like manufacturing ball bearings and consulting for small and medium size firms.

I was from an engineering background, and it did make sense to venture into making ball bearings. But then we found out that it required an investment of about Rs 5 crores, which was nearly impossible to gather at that



time. The bankers we met spoke highly about offering loans to youngsters but got weak in the knee when they saw our loan request. They refused, saying that the amount was too much to give without collateral to inexperienced people.

Then, we pondered over offering consulting services to SMEs – this was also aimed at manufacturing firms and so closer to the first idea. We started working with a few companies and charged a fixed amount for consulting but also took a variable pay based on the revenue that the idea generated. While it was a source of income, it was also a way to get our hands dirty on the field. This consulting was not merely about giving presentations, but about doing and showing our clients that our ideas could work. So it was an interesting experience.

But then we came to the third option: education, which is where Butterfly Fields came

into being.

Butterfly Fields started as a summer workshop for children. We found that parents wanted to engage their kids into activities that were fun-filled as well as involved learning. We offered all sorts of experiential activities as part of the workshop. For example, to demonstrate the concept of optics, we opened up cameras and showed children how they worked. We showed them old gramophones to demonstrate how sound was produced. Parents liked it and the kids were excited! We got good feedback on the workshops and even featured in a local newspaper. Soon there were a lot of calls and suddenly there was scores of parents who wanted to admit their children into our weekend workshops.

The next step for us was to align the workshops with school syllabi. We took the children for field visits to bread baking firms or soap manufacturers. We also created certain



activities which children did on their own. More and more of our time got invested in creating modules for these children and we really enjoyed it. So while we continued our consulting work for SMEs, we worked on Butterfly Fields during the summer or on weekends.

The next four years passed this way: consulting assignments on weekdays and teaching on weekends. In 2007, Young World covered us in one of their issues. Soon, a school approached us. When we presented our models to the faculty, they were excited and asked us to take sessions for the students. Until then we were not bothered about which class the students studied in, but the school wanted us to develop different models for different classes based on their syllabus. The most mind boggling bit was the number of students involved. The school wanted us to conduct activities for all students from 5th, 6th, 8th and 9th standard -- totaling to almost 1800 students! We had never operated with such numbers and had some serious thinking to do. We had to arrange material for all those students, which was also operationally challenging.

I still remember the first day. The session

was held from 8 am to 3pm. The room was full of students and I had to shout at the top of my voice to be heard. There was a lot of commotion with some of the students not being able to see clearly. I was quite sure the principal would be unhappy but this was quite the opposite. It was also amazing to see the energy and enthusiasm the children showed towards doing the activities, despite my voice not being audible and a shortage of material etc. The activities took place across classes during the week and this took a toll on my consulting work. The principal wanted us to do more and even link activities to the curriculum.

This way, Butterfly Fields evolved. It was never a planned effort. Everything we did for it made us ask one question first: are we enjoying it? And if we are then let's do more of it!

And one question we never asked was: "Are we making money?"

During this time I was invited by Sankalp, a professional body for entrepreneurship in the social space. There I had an opportunity to meet venture capitalist and investment bankers. They knew about my work and were quite interested. They visited some of the school where we were served and spoke to us about raising money. We asked for Rs 50 lakh but that was too less for venture capitalist. This, however, led us to work on a formal business plan for Butterfly Fields. Thereafter there were other VCs who approached us to create IT models for our work, but we wanted to retain the hands-on experience of our activities. Then we were approached by the VC Avishkar, which funded social ventures. The team at Avishkar asked if we would work with government schools and underprivileged children. We said that as long as it was viable, we would be more than happy to do it since we enjoyed working with



government schools. Soon, Avishkar offered us Rs 5 crores.

Soon, huge contracts followed! We got a government project where we worked with 3,500 government schools. We charged roughly Rs. 60 lakh for the project but made an impact on 3 lakh students. Working for the government brought us some margins that weren't exorbitant, but helped us create a larger impact. Right now we are working with close to 3,800 government schools and 200 private schools.

When we started in 2008, we were a team of just three, including an office boy. We worked out a fixed salary for the new joinee but since we were not earning much I did not take any salary. The team was building on references from existing employees. Many people were curious about the company but got deterred by the teaching aspect of the job. From 2007 to 2010 the team grew to 18 people. Eventually with the growth and suc-

cess of the organization we set up operational departments and started hiring people there. We are now a team of 70 people across three states.

We will be working in Tamil Nadu soon with a large chain of schools where our models will be integrated with the curriculum. We also plan to work with the government of Tamil Nadu to convert the models into Tamil like we did with Telugu in Andhra Pradesh. The decision to set up in Hyderabad was because Praveen and I had a support system here in terms of family. But expanding to Tamil Nadu and Karnataka was a business decision. These states have schools looking forward to evolving and incorporating changes. Geographical proximity of these states also made them viable. The challenge now is to remain connected as we expand.

Looking back, I realize how much the beginning was shaky. The first challenge was to convince my family, but my parents were

The school wanted us to conduct activities for all students from 5th, 6th, 8th and 9th standard -- totaling to almost 1800 students! We had never operated with such numbers and had some serious thinking to do.



always supportive of my ideas from the beginning and were satisfied once I explained everything. I also gained a lot of support from my family after our we got good feedback from parents for our workshops. I even got married at the end of first year. I had managed to earn around Rs 8 lakhs from both consulting and Butterfly Fields. But our expenses were close to Rs 6 lakhs, so we were hardly made Rs.20, 000 a month together. It wasn't great considering we could earn double the amount in a regular job. It was tough. We didn't manage any variable pay. After marriage, I considered more stable income sources but my wife was very supportive. She told me to continue doing what I enjoyed and not to worry about money as she was earning well.

As for Praveen, by the end of the first year of starting Butterfly Fields his parents got worried because we were going nowhere. People asked us if we were giving tuitions, or coaching students for IITs. That was when Praveen thought it made more sense to take up a regular job in the corporate world, especially since he had not worked earlier. He ended up with a job in Bangalore and we even planned a Butterfly Fields centre there. However, once he started working, he got sucked into the job and had no time for all this.

The Way Forward

Going forward we plan to strike a balance between working with elite schools, private schools and government schools. While our approach to each might differ based on the students, but the concepts remain the same. We are also considering venturing into a direct customer approach model. Opportunities in both B2B and B2C are huge. But that is a completely different approach and involves a lot of factors. To evolve a brand that is available to customers, the marketing and approach is completely different. We need to figure out a way to grow without one cannibalizing the other and it is a challenge before us.

We are now looking to expand from 70 to 150 employees in the next year. The common thread linking our members is the belief towards our work. They are interested in the work at Butterfly Fields and are passionate and excited about it. They are all successful professionals who chose to work with Butterfly Fields to make a difference in education. ●



*Sharat Chandra
B.Tech 2001,
Chemical
Engineering
Hostel 6*

A Painter and a Poet

This section stands in for both our 'Road-less-travelled' section as well as 'Pseud Corner' of the magazine. It represents the talents of a man who may have started out as an engineer but somewhere along the way decided to tread on the path less taken. Hiro Chhatpar completed his B.Tech. from IIT Bombay in 1965 and went on to complete his MA from Utah Stan University. He is an accomplished artist in the style of abstract expressionism and has received many national and international awards. His paintings grace galleries in Salt Lake city, New York, Mumbai Bangalore. There is one that graces the walls of the IITBAA office walls in Powai which he so generously donated to the Association. This time around he has shared his poetry but Queenbee hopes that next time around he will share some of his paintings. The pages of our magazine could certainly do with some colour.



Queenbee

Starry Nights

Hiro Chhatpar

Starry starry nights:
What strange dance do these stars do
High up in the sky
Swirling, glowing, rolling
Then bursting with light.

I sit and watch on a hillside far below
Mesmerized by the glorious show
The cold air, chills my bones
As I snuggle closer to my beloved at my side.

Celestial bodies burst forth in brilliant hues
Of blue, yellow, gold, and silver white
Spinning, gyrating in pulsing radiance
Exploding, collapsing and exploding again
Bathing the town below in blue light
As a golden quarter moon looks on.

Time has no place in this night
As I am lifted up among the stars,
Surprised at the tranquility there...
I surrender to the movements
Flowing and ebbing on a tide of constella-
tions
Over and over again until, exhausted;
I return to the hill below.

Dawn begins to break, fading the sky to
gray...
The show is over, it is time to go;
Some one whisper in my ears,
And announces: Yes, it is new day...



M&B

For some, M&B denotes Morrison & Boyd, authors of the organic chemistry textbook taught in the second year. For a few more, M&B or Mills & Boons takes them into the mush-land of sunsets and roses. For most, MB is the dreary, dark-grey Main Building with classrooms and lectures. But for a very few, MB denotes all three. Boy meets girl in a lecture hall at MB. They trade lecture notes. An organic chemistry develops between them. And they walk away hand-in-hand towards a Powai sunset and swear undying love over a glass of sugarcane juice at YP. To repeat a point made countless times before, the sex ratio in the eighties was skewed, with 2,500 boys to 70 girls. So while the guys planned, plotted and conspired to get an 'intro', there were thousands who did not even get on to simple 'Hi' terms with a girl. Most dismissed their lack of success with a casual, "I am not interested in an IITian female." Girls who wear spectacles and think of differential equations which can be used to emit signals in a remote sensor, are not good enough dating material—that was the refined opinion of the did-not-even-run, leave alone the also-rans.

In this issue, we bring you one famous campus romance story from the eighties. Soumitra Banerjee and Tara Subramanian yielded to Noseynee's persistent nagging to tell all about a story that started on a black Yezdi 250 cc.

She was a 'Tam-bram' from Zambia. He was a Bong from Kalyan Dist. She loved books, mountains and social issues. He loved bikes, cameras and his guitar. He went by many monikers. Bappa, Bappi, Baps, Banny, Benny, Benjy, Behenji. And depending on which girl rode on his pillion, he would also be nick-ed Benjaminium or Banerjekar. But she remained Tara and nothing else. Like the pristine little star that is urged to "twinkle, twinkle". To ensure that theirs was a marriage made in heaven, they frequented the Devi temple every evening, ostensibly to seek divine blessings. Most days, they zipped around for movies and ice-creams on his fast black monster of a bike. Some days, they chose a quiet romantic rowboat in the placid Powai lake.

Rudyard Kipling had once said, "East is east and west is west. Never the twain shall meet." But she was from the South, not the West. And South and East did meet. In a workshop where she broke hacksaw blades. And in a tutorial where he solved problems in his sleep. At monsoon treks. On his Yezdi. And in what can be described as an irony of fate, they both moved South-East to Surabaya in Indonesia. He floors people with carpets that his company manufactures. She makes offices and shelters and ships them worldwide through containers.

Noseybee

M&B v.1982



I loved IIT B the moment I walked in.

Huge trees along both sides of the road, whether you entered from Y-Point side or the other, enveloped you in a cosy embrace and as you walked down the road the cool breeze would fill your lungs with the smell of fresh earth that emanates after rains. It was so green all around and so beautiful.

One always joined IIT just at the onset of the monsoons. I had missed my orientation. My brother took me around. Kandu was in his fourth year at IIT B and we had always been very close. The warmth of having him around and close by took away any fear of being in a new place, a strange place, so far away from anything I had been used to.

The hostel was a home away from home and more enjoyable due to the unexpected and unlimited amount of freedom that came along with it....



Ragging in H-10 was very mild, but yes, it did bruise one's ego and left an unpleasant memory to linger . especially the fact that one's own cousin was on the other side. Girija was just a year older, but 2 years my senior as a result of having got a double-promotion for her outstanding performance at school. I guess I should have understood her situation better, but sometimes, young minds tend to be more judgmental than reasonable.

There were nine girls in our batch that year -- the largest number in many years, we were told -- and we made friends easily, but I sorely missed my friends in Zambia. Minus them, I felt lost and without an identity of my own. Our seniors were nice and full of fun and the first thing they introduced us to was the escape route out of our Hostel -- climbing down the drain pipe from 1st floor and leaving the premises from the rear, without the knowledge of the Gurkha guarding the

front entrance which would be locked daily at 10:00 pm. Coming back into the hostel after 10:00 pm was surprisingly never a problem, as some excuse or the other would be accepted.

Settling down in first year was difficult. Co-ed schools were a common feature in my life, but to be out-numbered in such a way by the boys at IIT B sent butterflies in the stomach. The lecture halls were huge and awe-inspiring and listening to the Professors speaking

Our seniors were nice and full of fun and the first thing they introduced us to was the escape route out of our Hostel -- climbing down the drain pipe from 1st floor and leaving the premises from the rear.



over the microphone was a strange experience too. So different from the comfortable little classrooms I was used to in Zambia.

I would usually tag along with the more hard-working and diligent group of girls from our batch, and often went to the library to study. I don't think I was very good at that and seriously wondered if that's what I wanted. I had thoroughly enjoyed school so much, but IIT B was proving to be so much more different than what I had ever imagined.

I'd never been brilliant or outshined others as my brother had done at school and college, but I had at least been a reasonably good student with my hard work and dedication, and would rank among the top three or four in my class at any exam. Here I was just able to scrape through the tests, even after all the efforts I would put in. The labs were the worst. I was equally bad at all the experiments I did. The oral vivas and my intense shyness to be

outspoken and answer confidently made me feel like a worm, squirming to be free. The only intention of our examiners seemed to be to prove how foolish we were. At least, that's what it seemed in those days. Instead of being kind and helpful and leading us to give the correct answers, they seemed cynical, skeptical and arrogant.

Seema and Madhu were always together like two inseparable, un-identical twins from the same pod and would often hang around with Shashank and Bakul. Alka was a home-lover. At any given chance, she'd run away home as she found it difficult to be away from her family and her school friends. Meenakshi was a perfectionist; her room would be spick and span and beautifully arranged. Gauri A was small in size, cute and outspoken. She was besotted with mountaineering and wanted to go trekking. KV Lakshmi was from Kuwait, but having had her back-ground from the Indian schools there, she could cope better at IIT B than me. She was nice and we were often together as we had both joined the MSc Chemistry course. Gowri L was a beauty. All the IIT B boys (or so it seemed at that time) from both our batch and the seniors were so mesmerized by her, it added to one feeling more awkward and even more inconspicuous. Rita Dubashi was tall, quiet, composed and very fond of Gowri L.

I vaguely remember Soumitra in my first year, more as a friend of Seema's and Madhu's as I had heard them mentioning his name at times. I had seen him sleeping in the Lecture Hall a few times, his arms folded on the table, cushioning his head on them. It shocked me. How could anyone be so rude? Did he have no manners at all to show such disrespect to our lecturers? Apart from that, I don't have much memories of him from my first year, though he claims to have seen me trying to write with my left hand once.

I wonder why? Was I perhaps sitting at the desk next to him and decided to copy him? Circumstances had forced me to write with my left hand for more than a month in my 4th year as my right arm broke after fall during the monsoon trek at the end of my 3rd year.

In my second year, I somehow got swept away from my more serious friends to the fun-loving group consisting of Seema,

The two of us would at times sit on the curbstones at the entrance of Hostel 10, and would only realize that the whole night had gone by when we would see the milk van pass in front of us.



Madhu, Alka, Meenakshi. I don't anymore remember how it happened... maybe it was the effect of the monsoon trek I'd joined at the end of my first year. The girls were so much more easy-going and comfortable to interact with. The continuous evaluation at IIT had been taken in our stride and it didn't seem to bother so much anymore. Mugging a day before the tests seemed to get satisfactory results compared to daily mugging and still getting similar results.

I saw a little more of Soumitra in my second year because we were often in the same tutorials. His consistent behavior of going to sleep at the first bench didn't stop appalling me. One of our tutors, Gautam Bhattacharya, would specifically tell us not to disturb him.

It so happened, that in one of our physics quizzes, except one person, the whole class had got the answer to an electro-magnetism

problem wrong. Gautam Bhattacharya was trying to solve it on the board for us but he also got mixed up after a while and was compelled to wake Soumitra up, who after solving the problem on the board promptly went to sleep afterwards.

Soumitra was one of the few persons in our batch to have got a motorbike that year. I used to be crazy about motorbikes and coming from a very conservative and protective south Indian background, anything that was not acceptable in their dictionary would attract me immensely. And to see Soumitra zipping around with Vasu was a common appearance as Vasu would also be with us at our tutorials.

One of the subjects in our second year was "workshop". Our first assignment was related to metal fitting. We had to cut a piece of metal in the shape of a "T" and ensure that the angles of the profile were all square. The workshop assistant demonstrated the technique of cutting the metal with a hack-saw. He told us to be careful when using the hack-saw as the cost of each of its blade was Rs 8 and breakages meant more costs. He picked a few boys to make some cuts in the metal. After they had tried it out, he selected me to check it out, with a large smile on his face and much confidence.

I nervously took the hacksaw and pushed it against the metal. It was not a smooth move and I could distinctly feel the hack-saw blade twist and snap into two pieces. It was so embarrassing. The workshop assistant said something equivalent to "never mind" in Marathi and fixed another blade. The second one also faced the same tragedy, and then the third one and so it went on till eight blades got broken. The assistant's smile had waned and his face was grim while the smirks on my classmates' faces widened more and more with each broken blade. I was horrified, and

the hot flush under my dark skin must have made me look even darker and with great restraint I stopped the tears from pouring down my face. Soumitra was standing just in front of me, next to the assistant, and his visible amusement added fuel to the fire and made me feel even more miserable and helpless. My mind was totaling up the loss the Workshop had incurred because of me and I was wondering how I would pay it from the meagerly pocket money I used to receive those days. And I was too egoistic to ask for more from my grandfather.

The girls had to ask for extra time to complete making the “T” shaped metal and with time, I learnt the technique of using the hack-saw without breaking many hack-saw blades.

After metal cutting, carpentry seemed like a dream. The wood would feel as soft as butter under the saw and melt into shape. It was a huge relief compared to cutting metal. Welding was fun but lathe didn't seem to make much sense then. Moulding was fun too: playing with the sand and getting the shapes in place. The patience and perseverance of the girls paid off with intact figures. I secretly got my revenge on Soumitra during our moulding classes. He was very quick at everything he did, whether it was metal fitting or carpentry or any other, but his quickness in moulding proved to be disastrous. He would often get called back by the workshop assistant to re-mould his figures, as the shape would disintegrate almost soon after they were made. The great satisfaction I derived from seeing this was like a soothing balm on a sore wound.

There must have been a sense of attraction then itself, for why else would I have been so touchy about what he thought about me? He had never made fun of me outright but it was embarrassing to be looked at with amusement. Life was complex when it came to such

matters, as you did not wish to acknowledge what you really felt and definitely did not wish to give any name to such feelings.

At the end of second year, I had wanted to switch to chemical engineering because pure science was just too boring to handle. Alka also wished to switch from M Sc physics to chemical engineering. We went to give our preferences and met Soumitra there as he too seemed to want to shift from metallurgical engg to chemical engg. Soumitra and Alka got into chemical but I got into civil. I was extremely disappointed then, but looking back now, I think that was the best that could have happened to me as I would never want to trade what I'm doing now for anything else.

I went again for the monsoon trek after the second year. A lot of my friends were there and, surprisingly, so were Vijay and Soumitra. As always, I would be among the last to finish climbing up the mountain each day. I was slow and did not have much stamina or will power, but somehow or the other, I loved trekking. It was like an addiction and I couldn't get away from it. Soumitra would sometimes wait for me and walk up with me. Again I would feel embarrassed for being slow and having to have people wait for me. But at least it helped break the ice between us and we became friends.

At the beginning of third year Soumitra and I would smile at one other as we were now officially friends after the time spent together at the monsoon trek. The formal surroundings of IIT-B, however, didn't give us much to talk about. So within a matter of days, the smiles disappeared and we would either look through each the other or look away if we accidentally happened to bump into one another. Of course, neither of us was ever alone as I would be with Madhu and he would be with someone else.

Soumitra and Alka on the other hand became good friends and he would often come to our hostel to pick her up on his motorbike and they would zip away to attend classes together. Whatever attraction that may have existed previously must have been a figment of my imagination, I thought, and decided to take more control over my mind and my feelings.

Sometime in the second semester of my third year, it so happened that there was a classical music program being held at Hostel 7. Madhu was very much into music and I tagged along with her and Alka to attend the program. Meenakshi was also a music enthusiast and came there on her bicycle. And to my surprise, Soumitra was also there, for he too enjoyed music a lot. The program went on for a long time. Madhu wanted to go back to the hostel as she had a headache. I jumped at the suggestion as I was thoroughly bored by then and Alka decided to join too. Soumitra offered to drop us back one by one. Meenakshi also offered her bicycle and said she would walk back once the program got over. Madhu took Meenakshi's bicycle and rode back while Soumitra went to drop Alka. Then he came back to get me, by which time I had covered a short distance by foot.

It was the first time I would ever sit on a motorbike and I was excited. I couldn't help telling Soumitra how crazy I was about motorbikes, after which he offered to teach me if I wanted and I promptly accepted this suggestion. The kick-start was next to impossible, but once I got on the bike, it was like a dream come true.

I loved the experience and was thrilled to hear the roar of the bike as it picked up speed and zipped past everything and everyone so effortlessly. After getting used to its weight, it gradually became easier and easier to ride it. I must have gone up and down the hill

road at least a dozen times, if not more, and Soumitra's encouragement to continue riding it for as long as I wanted reduced the guilt of blowing up so much gas. The whole episode was absolutely thrilling.

When I reluctantly decided that I ought to get back to my hostel, I was startled to see Madhu and Alka waiting for me, and extremely worried as I was missing for so long. When I told them that I was learning to ride the motorbike, Soumitra was bombarded by a whole lot of our hostel's girls and he had to teach them all to ride his motorbike. I'm sure he must have thoroughly enjoyed all the attention he got from them then.

Just before dropping me off, he had asked me if I wanted to go and see a particular movie I had heard about from my brother. It was playing at Eros and he said we could go and see it. It was so unexpected that the first thing that came to my lips was "No," the excuse being that I had a test the next day and had to study for it. But when our test got postponed to the next week, I couldn't get rid of the thought that I had been asked out and I had refused.

I immediately called Soumitra and said I wanted to go. From his tone I could gather that he was surprised, but he agreed to pick me up in the evening. Next, I told Madhu that I would be going out with Soumitra to see a movie. She couldn't understand why on earth I wanted to go out for a movie with him. My friends were all surprised. In those days we cooked on our own under our MAMTA (Madhu-Alka-Meenakshi-Tara-Anita) banner, as we couldn't stand the hostel food anymore. Special care was taken that day to prepare my dinner on time, and I was forced to eat with 4 pairs of protective eyes watching over me in concern.

Soumitra was duly warned by my friends to



drive carefully as they didn't want me getting hurt because it was a known fact that he and Bakul were extremely accident-prone. But as it would happen, we did have an accident that day. The car in front of us stopped suddenly and even though Soumitra braked, it was not enough and his bike rammed into the car. It was lucky that his mechanic was also riding close to us that day for he soon got the bike in working order for the occasion, with instructions to bring it back to him the following day.

Our first date was nice. We had ice creams and I just loved ice creams. The long drive to the city and back was also fun. Back in hostel, everything seemed so unreal.

Our relationship was however extremely inconsistent and often hampered by our prides and egos. There was a long gap of nine months when we had no contact with each another.

Then sometime in the 2nd semester of our 4th year, we started meeting again. If I would be missing for too long, search parties would go out looking for me and land up at Hostel 4, which was Soumitra's hostel. My friends were very protective of me from the start to the end. Instead of having one concerned mother around, I seemed to have four.

The two of us would at times sit on the curbstones at the entrance of Hostel 10, and would only realize that the whole night had gone by when we would see the milk van pass in front of us. Soumitra would go back to his hostel and catch up on sleep while I would drag myself to attend lectures. He would later get a good scolding from my friends for having kept me up all night.

With all the ups and downs that took place, nothing may have ever resulted from our interaction had it not been for the five long years we spent at IIT. Soumitra never asked me to marry him. He never took such matters seriously and would always laugh it off if we ever happened to discuss the subject.

I was 21 when I graduated from IIT and Soumitra was a year older. Had my parents not been concerned about my advancing age, we may have just continued being friends; sometimes more than friends, and at other times less than friends, with our relationship oscillating like a pendulum. But my parents' inclination to match-make my horoscope with some well-qualified, well-settled south Indian boy catalyzed the fact that we needed to bond.

Marriages between different states were also not so easily acceptable then. After sustaining all the pressures for and against from both sides of our families, we finally got married three years after leaving IIT, thanks to the full support of our siblings.

But as a husband, he's always been very committed and sincere, and very different from the casual profile he always sported when single. He's the best friend I have now and the fact that we've literally grown up together helps so much in overcoming any difficulties and differences.

What more can I ask for ☺? ●

Placement Report from IIT Bombay

2011-2012

Unlike the uncertainty from the global economic slowdown and double-dip recession, IIT Bombay confidently entered its placement season due to high quality students and a strong corporate relationship. In 2011-2012, recruiters continued to show very positive interest in our students. The first phase of IIT Bombay's campus placement in December 2011 saw participation by around 200 companies, which offered close to 800 jobs. Up to July 10, 2012, nearly 300 organisations have taken part in campus placement and have offered over 1050 jobs. Students from Bachelor of Technology (B.Tech.), Master of Science (M.Sc.), Dual Degree (D.D.), Master of Technology (M.Tech.), Master of Design (M.Des.), Master of Philosophy (M.Phil.) and Doctor of Philosophy (PhD) programs in various fields of engineering, science and technology, design and humanities participated in the placement process.

The process began in July 2011 with invitations to companies to visit the Institute for pre-placement talks and to provide their job announcements. The talks provided avenue for interaction and familiarisation of students with the recruiting organisations and their work profile. The company interview process began from December 1, 2011 onwards. A small number of the eligible students did not actively participate in the placement process due to their other career choices.

There was a 20 percent increase over last year in the number of jobs offered on Day 1.



'Day 1'

The celebrated 'Day 1' of IITB placement on December 1, 2011 saw 29 firms, representing some of the most coveted firms in the global industry. A unprecedented 142 jobs were offered on Day 1, all belonging to the high-end job market and reconfirming the commitment of top recruiters towards IIT Bombay graduates. There was a 20 percent increase over last year in the number of jobs offered on Day 1.

Continuing commitment towards engineering and technology-oriented jobs

The students of IITB continue to demonstrate their strong commitment to their core educational background in the choice of employment. More than two-thirds of the students opted for science, engineering and technology-oriented jobs, with the recruiting companies operating in various sectors of the economy. This can be primarily attributed to the highly challenging work profile and compensation package offered to IIT graduates by recruiters. In fact, a much larger proportion of students would have opted for such jobs companies considering the students'

interest.

Strengthening presence in the Management Consulting sphere

Over 20 leading management consulting firms, including several global leaders, visited IITB for campus placement this year. These organizations work with large corporations across the world and help them resolve complex business problems. They carry a reputation of being very selective in their choice of campuses and of having extremely high standards in their recruitment process. With the high quality of recruits that these companies took last year, they came back with renewed vigour as even some new firms came on board. Over 100 offers were made in the management consulting sector.

Increased prominence in the Financial Services sector

Continuing the trend of the last few years, the finance sector was a major recruiter this year too. Over 80 offers were made by financial services sector to IITB students. With many of the top global companies in this sector preferring IITB over other campuses, the sector saw a rush among the top-level as well as the mid-level companies to recruit the brightest and the best from the campus. A variety of profiles were opened up in the sector as these companies have begun to appreciate the analytical and quantitative analysis capability of the IITB students.

Research & Development to the forefront

With the economy increasingly striving for high-end products and services, a larger number of companies now strive to develop products on the forefront of technology. IITB saw an increase in organisations hiring fresh graduates in the R&D sector. This sector had been steadily growing for the past few years and this year IITB saw some premier job offers. A total of 15 R&D organisations

Continuing the trend of the last few years, the finance sector was a major recruiter this year too. Over 80 offers were made by financial services sector to IITB students.



offered 62 positions this year.

Good response to Government/Public sector opportunities

Several IITB students have shown their inclination towards career in the Government or public sector organisations. Sector leaders from Government organisations and public sector companies including several Maharatna and Navaratna companies recruited from IITB. A total of 35 students have been recruited by 11 such organisations.

Educating the future generations

IITB has continued to provide faculty to several educational institutions through campus placement. Over 25 students, including several with doctoral degree, have been offered jobs in educational institutions through campus placements.

Diverse recruiters

While the placement season has seen recruiters from the entire spectrum of the industry, the initial part of the season was dominated by a variety of firms from sectors like engineering and manufacturing, computer software and hardware, management consulting, finance/banking and fast moving consumer goods (FMCG). Most of these firms are world leaders in their respective domains.

Preparing well-rounded students

This year a key focus of the Placement Office was to prepare students for their placement.

IITB students are expected to excel not just in technical knowledge but also in leadership, teamwork and other attributes. A large number of preparatory activities were conducted this year for the graduating students, including refresher lectures on various technical subjects. In addition, preparatory programs to enhance communications skills, interview skills and group dynamics were also organised. Several talks with alumni working in diverse sectors were also organised to orient the students regarding different job requirements. A total of 230 preparatory sessions were organised by the Placement Office.

Conclusion

The highly successful student placement in 2011-2012 clearly demonstrated the demand of IITB graduates among the top recruiters in various segments of the economy. The recruiters appreciated the knowledge and training of our students. A majority of our past recruiters held their faith in our students' abilities and came to recruit in large numbers. The year also saw several new organisations visiting IITB for the first time, and we look forward to fostering long-term relationship with all these organisations.

The achievement of the Placement Office, combined with excellent academic system and the opportunity for all-round development, has also contributed to making IITB the most preferred destination for students. The Placement Office, through the campus placement, has made a notional contribution of Rs. 1.08 crores to the Institute considering the typical industry income for placement.

The success of the placement endeavour can be attributed to the outstanding quality of our students as well as the tremendous support provided by the Institute administration, academic units, faculty and staff, alumni and other well-wishers. The Placement Office thanks them and looks forward to their continued support.

Program-wise placement data (2010-2011 data in brackets):

ACADEMIC PROGRAMME	REGISTERED	PLACED*	% PLACED
<i>B.Tech.</i>	353 (305)	319 (279)	90 (91)
<i>Dual Degree</i>	205 (225)	192 (214)	94 (95)
<i>M.Tech.</i>	552 (476)	477 (412)	86 (87)
<i>5-yr M.Sc.</i>	14 (16)	13 (14)	93 (88)
<i>2-yr M.Sc.</i>	137 (108)	80 (64)	58 (59)
<i>M.Des.</i>	57 (57)	34 (34)	60 (60)
<i>M.Phil.</i>	5 (7)	3 (3)	60 (43)
<i>Ph.D.</i>	64 (55)	31** (11)	48 (20)

* This includes a few students who were placed without assistance from Placement Office and those who opted out of placement to pursue other career opportunities or higher studies.

** Many Ph.D. students opt for post-doctoral fellowships, faculty/research positions in government institutions or other career choices without availing the services of Placement Office, and are not included in this count.

Placement detail by range of salary offered:

RANGE OF GROSS SALARY (IN LAKH RUPEES PER ANNUM)	NUMBER OF ORGANISATIONS	NUMBER OF OFFERS RECEIVED
<i>Above 9.5</i>	65	322
<i>Between 8.0 to 9.5</i>	43	174
<i>Between 6.5 to 8.0</i>	42	137
<i>Between 5.0 to 6.5</i>	61	282
<i>Less than 5.0</i>	51	145
Total	262	1060

Placement detail by type of organisation:

Sr. No.	SECTOR	NUMBER OF ORGANISATIONS	NUMBER OF OFFERS RECEIVED
1	Engineering & Processing	75	282
2	Software, IT	56	258
3	Consulting	24	107
4	Finance	16	84
5	Tech	22	92
6	Research & Development	15	62
7	Analytics	14	53
8	Public Sector/ Government	11	35
9	Education	7	27
10	FMCG	5	15
11	Services	3	7
12	Others	14	38
	Total	262	1060



The Pointless Pencil

Grumblebee

Prof 1: Hey secretary! Where are you going?

Secy: Sir, I am going out to buy a pencil.

Prof 1: Why should you buy a pencil? It's the job of a purchasing expert. How do we know you'll buy a pencil of the right quality and at the right price?

Secy: it's only a pencil Sir! Hardly costs a rupee.

Prof 1: It's not a question of the price. It's a question of following the right procedures. I want to identify a correct procedure for procuring a pencil. Can you quickly have someone convene a senate meeting?

A senate meeting is convened.

Prof 1: My secretary wants to buy a pencil. I want to know if we have an established procedure for this exercise.

Prof 6: Normally, we invite competitive bids from reputed tenderers and insist that there should be at least 3 in the fray.

Prof 2: But for purchases totalling less than Rs. 20 lakhs, we do not insist on a tender.

Prof 3: But how do you know if the proposed purchase is less than 20 lakhs?

Secy: Dear Sirs, I have bought many pencils before and I know that it will not cost more than a rupee.

Prof 5: You don't speak out of turn. Even I

know that a pencil will cost less than Rs 20 lakhs. My point is, who are we to pre-judge a price and decide on whether to tender or not? If we all worked according to our hunches and prior knowledge, we wouldn't be capable of research. Einstein wouldn't have discovered relativity had he gone according to others' conventional wisdom.

Prof 6: Let's do this. Let's send someone to the market and assess rates from 3 different vendors. Once it is clear that the price is less than Rs 20 lakhs, we can safely avoid the tender route and go ahead with the purchase.

Prof 1: You all are missing the pencil point. What if one of the vendors quotes Rs 21 lakhs for a pencil even though the other two quote a rupee? We will be forced to call for tenders.

Prof 4: I think we are all wasting our time discussing issues which don't concern us. This should be debated within the members of an expert purchase committee. Let them finalize the procedure and handle procurements.

Prof 22: Excellent idea! But who will constitute this expert committee?

Prof 17: The expert committee should be identified by people who specialize in identifying the right people for the right job. Let's set up a search committee who will locate and empower people who specialize in purchasing the right material at the right

price. Let's form a 6-member search committee from amongst us and this committee can deliberate separately and identify six persons for the expert purchase committee.

Prof 7: Why 6 persons? Why not 1?

Prof 17: We should not put all our pencils in the same sharpener. Better to spread ourselves thin. Who knows if a person will go on a holiday if the special leave committee sanctions his leave or maybe they'll go to the hospital if the medical committee certifies them as sick. We need solid fallback arrangements. You can't go wrong with the number 6.

Prof 9: But the purchase committee will need some policy and guidelines for purchasing. Who will provide them with these inputs?

Prof 8: maybe we can set up a policy committee. Once they evolve a policy, purchase committee will work within those norms.

Prof 22: Excellent idea! But who will constitute this policy committee?

Prof 17: The same 6-member search committee can identify a 6-member policy committee.

Prof 15: But how can you be sure that the purchase committee is procuring a pencil of the right quality? Should there not be a quality control committee that can test the quality of lead in the pencil?

Prof 14: Prof 15, you are a metallurgy Prof and can think of only lead. Please remember that a pencil is made of graphite. I should know, chemistry Prof that I am.

Prof 14: All this sound fine. But where will all these committees meet? Who will pay for the venue? Who will cater for the refreshments?

Prof 16: Why don't we set up a catering committee that fixes the refreshment menu in accordance with the budget laid down by a finance committee which in turn will be

directed by the policy committee as to how much can be considered as a permissible expense for a coffee and a samosa?

Prof 22: Excellent idea! But who will constitute the catering committee and finance committee?

Prof 17: The same 6-member search committee can identify six members each for catering and finance.

Prof 5: All this talk is fine. But who will ensure that all committees are formed and that they all perform and not just eat samosas. By the way, can you pass the samosa plate here please?

Prof 7: Normally, the implementation is overseen by a special standing committee?

Prof 10: Standing committee? What sort of a name is that? Why don't we call it implementation committee? What does standing committee mean? Is there a name committee who can answer this question?

Prof 6: We can always create a name committee. However, I think that this is called a standing committee for a good reason.

Prof 4: What?

Prof 6: In most committees, people are sleeping. In a few, they are sitting...sitting on decisions and not just on chairs. So if we have a few who are left standing, they are likely to do some work apart from gorging on samosas.

Prof 11: I envy the standing committee guys. In an earlier committee, I was sleeping. But these guys were standing outside the room and the Board of Governors saw them and gave them an "outstanding" achievement award.

Prof 1: Gentlemen! I think this has been a very fruitful discussion. Our problems of procuring a pencil are solved. I think we



should send out the minutes of this meeting to the Board of Governors for their approval. Secretary, have you noted down the minutes?

Secretary: No Sir!

Prof 1: (angrily) Why not?

Secretary: Sir, I didn't have a pencil to jot down notes.

Prof 1: In that case, I propose that we authorize my secretary to go and buy a pencil with which she will jot down these notes about how to buy a pencil. Secretary, please go and buy a pencil quickly.

Secretary: I am afraid I cannot do that now. I am coming down with a disease.

Prof 1: You are sick? What disease?

Secretary: It is a brand new disease. It's called committee-itis.

Prof 1: Committee-itis? What kind of a disease is that?

Secretary: That's besides the "point", to put it very "bluntly". ●



TREELABS

Shirish Potnis

A fluorescent lamp more energy efficient than an LED?

A welding machine that can be carried in your shoulder bag?

A radio-frequency induction heating system up to 30 times energy efficient than conventional equipment?

If you thought path-breaking inventions were the sole prerogative of the IBMs and Bell Labs, think again! It's happening right in our backyard.

Welcome to our own TreeLabs !

Tucked away among the workshops on our campus, TreeLabs is quietly taking the first baby steps of what promises to be an exhilarating and fruitful journey. The brain-child of Dipankar (C88, EE and with a PhD in Physics from Rice Univ, USA), TreeLabs has been set up with a goal to “teach” students to innovate. These products, which provide a glimpse of what is cooking at TreeLabs, are just a few that have kept Dipankar busy over the past decade or so. These are in different stages of development and plans to commercialize them are on the drawing board.

TreeLabs was set up as a “not-for-profit” Section 25 company and its Directors are Prof Deepak Phatak and Niranjan (C88, MatSc). The Intellectual Property that will be generated by the “inventors and innova-

tors” shall reside with TreeLabs and revenue from such inventions, by the way of royalties and licensing fees, shall be used for nurturing more innovations under the TreeLabs umbrella. The commercialization of technologies developed by TreeLabs will be done through “daughter” companies specifically spun off, or through licensing the technologies to suitable parties.

TreeLabs has already spun off a unit “Hams Solutions Pvt Ltd “ which has perfected a “queue management solution” ; the first installation deployed at the prestigious Tata Memorial Hospital in Mumbai has been very well received. The young team of entrepreneurs which developed and marketed the product -- Narasimha, Kawaljit and Michelle -- are now training their guns on other large hospitals and hospital chains and on other places where customers or patients end up spending a lot of time waiting.

Lampo, the fluorescent lamp designed by TreeLabs, has been one of the two finalists as “one of the 10 great innovations that will change the world in next 50 years” selected by an elite panel of judges including the likes of Dr. R Chidambaram at an IIT-B competition. The current model of Lampo consumes just about 40% of the power of an equivalent white LED. But that's not all, the version on the design board may reduce the power consumption further hold your



Lampo, the fluorescent lamp designed by TreeLabs, has been one of the two finalists as “one of the 10 great innovations that will change the world in next 50 years” selected by an elite panel of judges including the likes of Dr. R Chidambaram



breath, by another order of magnitude!!!

The IIT community has been the bedrock of support for TreeLabs and everybody concerned right from the Director and the Deans have encouraged TreeLabs to take roots and grow. Recognizing the potential contribution that TreeLabs could make, EE Dept of IIT Bombay has allotted it substantial space in the workshop bays. TreeLabs has built a small laboratory cum workshop of its own, often salvaging defunct and junked equipment from various departments by making them operational. Here you will find many machines like a high quality vintage lathe from the former USSR, a precision lathe from Schaublin, Austria --all salvaged from “to be junked” status and made shop-floor ready for use by aspiring inventors. But most importantly what the IIT community has given to TreeLabs is the strong sense of

support, the approval of the efforts already put in and the encouragement in pursuing the future course charted by TreeLabs.

Besides specific innovations or inventions that could come out of TreeLabs, an equally crucial outcome is the culture of innovation that TreeLabs is inculcating among students on the campus. There are many groups of students and student clubs of IIT Bombay which are at the moment actively working under the guidance of Dipankar, trying to make their own ideas work.

The enthusiastic support that faculty members of IIT Bombay lavished upon TreeLabs goes far beyond mere words of encouragement for this fledgling organization. A good part of the initial funding of TreeLabs has been received as donations from these supporters. But the gap between the invention and successful commercialization of technology still remains to be bridged. These technologies will have to be protected by patenting them globally, which by itself is a task requiring a huge outlay even before any commercialization can be considered. TreeLabs requires funding for these expenses as well as for building state-of-the-art laboratories for further research and to produce prototypes of products from the drawing board. Since TreeLabs is a Section 25 company, the funds will have to come in as “donations” from well-wishers at this stage before the revenue

Besides specific innovations or inventions that could come out of TreeLabs, an equally crucial outcome is the culture of innovation that TreeLabs is inculcating among students on the campus.



streams from the products developed can sustain it.

Most importantly, the entire TreeLabs movement would require high quality human resources to power the process: domain experts in relevant R&D, project planning and execution, vendor development, production, sales and marketing, IT and commercial functions -- the entire spectrum of functions that is required to build a vibrant organization from scratch. In the time to come, the TreeLabs eco-system will have a number of industrial units each operating independently, each at the leading edge of technology in its own domain, all linked to TreeLabs with an umbilical cord feeding each of them with the latest technologies.

Although TreeLabs is a “not-for-profit” company, the daughter companies will be commercial entities and early entrants into this eco-system can look forward to buying a stake in the companies they will be actively involved in building and running. The initial “donors” to TreeLabs will also have an option to invest in the first few “daughter” companies that get spun off. The modalities of such involvement are being hammered out .

This is a clarion call from TreeLabs to the IIT community and beyond. Whether you are a young student or a recent pass-out burning with a desire to bring your ideas to fruition,

or if you are a battle-hardened veteran from industry who would like to leverage her invaluable experience -- all are welcome to contribute towards this movement. The only pre-requisite for anyone to join is a strong desire to contribute to this movement and the willingness to take on a challenge. The rest, as they say, is the future.

For more information on treelabs, visit www.treelabs.org

Or mail to info@treelabs.org ◆



The Great JEE Debate

The Joint Entrance Examination (JEE) was introduced in 1961 as a Common Entrance Examination, for admission into the Indian Institutes of Technology. Over the years the JEE has become a veritable international benchmark. Designed, administered and assessed by IIT faculty members themselves, JEE today is an institution. It is revered by those who have seen the process from close quarters, and is held in awe by all who have attempted it whether successfully or not.

The JEE is viewed as perhaps the only examination in the country that has not been 'broken' by the ever-present forces of corruption. The IIT faculty, which has zealously guarded the sanctity of JEE, deserves the utmost credit for this. The 'toughness quotient,' if one may define such a term for JEE, will undoubtedly be the best in India and close to the best in the world (at least among university-level entrance examinations). The IITs, created by an Act of Parliament, have been given the power of autonomy that gives the right to design their own selection, admissions processes and the curricula. IIT faculty has guarded this right with vigor and conviction despite many attempts to dilute its two pillars -- meritocracy and academic autonomy.

The current proposal for reforms have issues that need to be addressed both from the structural and procedural standpoint. What we have attempted here is a brief decon-

struction of JEE as an institution, a critical analysis of what ails the system and some of my own personal recommendations.

Ez Bee

IN THE BEGINNING:

IIT Kharagpur was the first and started functioning in 1950 and formally inaugurated as an IIT in 1951. On September 15, 1956, the Parliament of India passed the Indian Institute of Technology (Kharagpur) Act declaring it as an Institute of National Importance. Four IITs followed -- Bombay, Kanpur, Delhi and Madras. Each was linked to a donor country that helped in its establishment: the USA for Kanpur, West Germany for Madras, erstwhile USSR for Bombay and the UK for Delhi.

Further expansion of the IITs:

A sixth IIT was established in Guwahati later in 1995, while Rourkee deemed an IIT in 2001. These were followed by a slew of eight more IITs: Gandhinagar, Hyderabad, Patna, Bhubaneshwar, Ropar, Mandi, Indore, and Rajasthan, BHU-IIT, all set up since 2007 in rapid succession, making this a total of sixteen.

The Institutes of Technology Act of 1961

This Act vested the right of admission of students and design of curricula etc to the IIT Council, which consists of the directors of all



IITs, chairmen of Board of Governors and representatives of Ministry of Human Resource Development. Individual IITs are governed by separate Boards, which comprise of the Director and other eminent persons from the fields of education, research and industry, besides nominees of Government of India. Operational matters of the Institute are looked after by the Director, who is supported by a Senate. The Senate, which sets the Institute's agenda, consists of prominent members of the faculty and various functionaries of the Institute.

THE EVOLUTION OF THE JEE:

Before 2000, the JEE questions used to be long answer types with just a few, if any, objective questions. However, as the number of students appearing for the tests increased, it became physically impossible for the faculty members to assess the papers in just 2-3 weeks. It was therefore decided to introduce a screening test. Thus filtered, students would appear for the 'traditional' type main test to finalize the list of candidates selected for admission. Since the screening test would be administered to a few lakh of candidates, it would be structured to consist of only "Multiple Choice Questions" (MCQs) which would be amenable to computerized grading.

This system worked well for a few years. However the MHRD was of the view that there was a strong correlation between the performance of students ultimately selected for admission in both the "screening" and the "final" tests. The "screening" test was therefore abolished from 2006 onwards and selections were solely based on the newly designed JEE, which was based purely on multiple choice questions or MCQs.

In the meantime, the number of students appearing for JEE has continued to rise and is about 4.87 lakhs this year. All of them will be vying for a place in the merit list of about 10,000. This merit list will be readied by the last week of May for admission to 15 IITs, Banaras Hindu University Institute of Technology (BHU-IT), Indian School of Mines (ISM) at Dhanbad, and a few other institutes. The number of aspirants and the available seats in are both expected to rise by 10% each year.

THE ANATOMY OF THE JEE:

It will be of interest to understand the anatomy of the JEE to appreciate it. Conducting the JEE itself is a massive exercise in logistics. The country is divided into seven zones, each entrusted to one of seven IITs (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Rourkee). Each of the 1,100+ centres countrywide is serviced by a team of a faculty member plus two staff members who travel to the centres with sealed question papers, supervise the examination with the help of local staff and get the sealed answer sheets back to the zonal centre where the answer sheets are assessed and the results tabulated.

The JEE Admissions Board

JEE is ultimately the responsibility of the Joint Admissions Board (JAB), which comprises of Directors of all IITs, representatives of MHRD and Chairpersons and Vice-Chair-

persons of each IIT.

The JEE Office

Each IIT has a JEE Office which is headed by a Chairperson and is supported by a Vice-Chairman and other staff. The nominees of the JEE Office include senior faculty members who are ultimately involved in administering the JEE. The JAB meets 2-3 times a year to set the policy guidelines.

The JEE Implementation Committee (JAB -> JEE Office -> JIC)

The actual implementation of JEE which consists of the entire process of designing the examination, administering it across more than 1100 centres across the country, assessment of papers, declaration of results and the admissions to various IITs and other institutes are all handled by Joint Implementation Committee (JIC). JIC comprises of Chairpersons and Vice-Chairpersons of each IIT JEE Office plus the Directors of seven IITs.

The Organizing IIT

One of these Seven IITs is designated as the “Organizing IIT” for the year and each of these IITs assume this responsibility by rotation for a year. It is the responsibility of the Organizing Chairman to organize these tasks and oversee the implementation. IIT Delhi was the organizing IIT for JEE 2012.

IS JEE PERFECT? WHAT AILS JEE?

The objective of the student is to gain admission to the best Institute he/she qualifies for. The objective of a Common Exam is to enable Institutes to pick the best and brightest students that apply to them. The JEE has been doing just that for the 60+ years of its history. Furthermore the JEE is conducted in a manner that establishes a selection criteria on merit alone, devoid of any controversies in the way it is set and executed. Yet criticism

regarding the JEE have been received from all quarters, both within the IIT and without.

Student demographics:

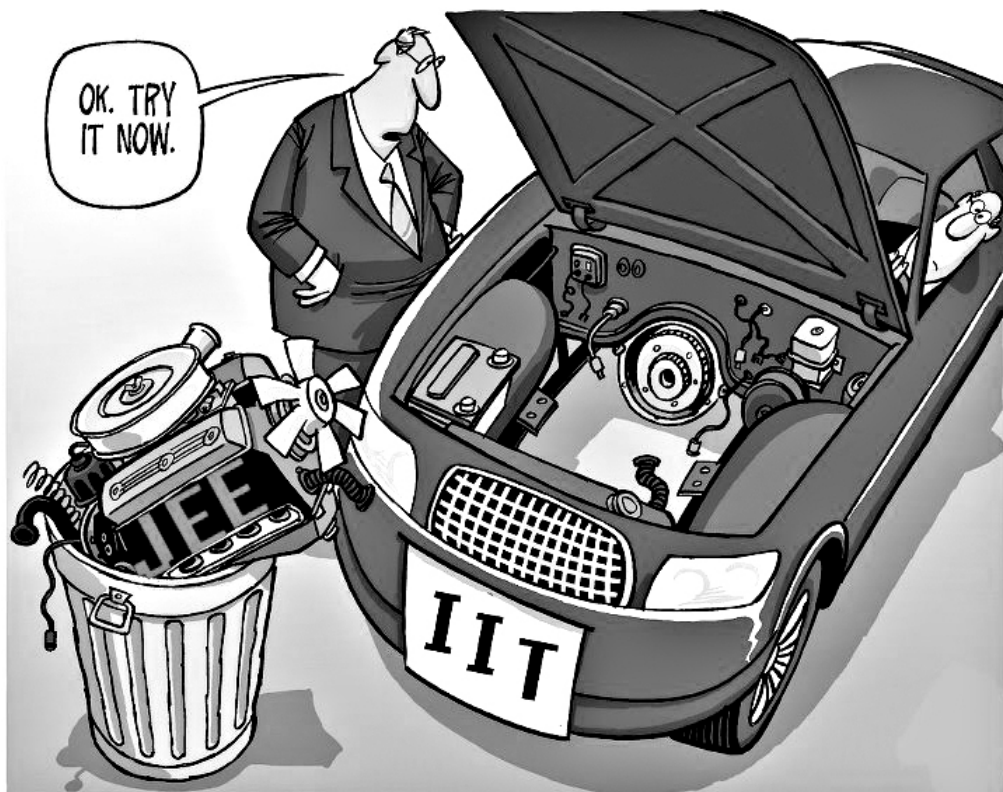
Prof Milind Sohoni, Head of Centre for Technology Alternatives for Rural Areas (C-TARA) at IIT Bombay and an alumnus of the Institute who feels strongly about the subject has written in one of his articles:

“The urban upper class and the upper castes just loved the IITs for its access to the west, and for its monastic setting. The JEE was a hit and the brand-name IIT was born. Almost from the first batch itself, going to the US was the norm for the upper half of the class. This was but a natural extension of the education that they had received. The industry got a few employees, but the dominant paradigm was to go to the US. Thus, right at the beginning, what was the ‘elevator’ at MIT became a ‘conveyor belt’ here, of escape to a richer society”.

It is important to note that this is more of a criticism of the IITs themselves and the intentions of student’s for vying for admission. The above is by no means a criticism of the JEE whose function is to admit the best and the brightest into the IITs.

The bane of coaching classes:

Preparing for the JEE has spawned an entire industry of “JEE Coaching classes” over the past 2-3 decades. These classes, which would set a student back by anything from Rs 2 lakh to Rs 2.50 lakh per year, are regarded by most parents of aspiring students as necessary for their success; a Guru Dakshina to the JEE goddess. These classes are considered to have a negative impact on the quality of the students getting admitted into IITs, not to mention the latent economic bias towards those who have the resources to pay for expensive coaching. Related to this is the



neglect of school studies in favour of the coaching classes.

The perceived efficacy of these classes however runs contrary to reality. While it certainly helps a student, an internal study has showed that the percentage of students tutored in these residential classes that qualify through JEE is not statistically significantly higher than the general success rate. The coaching classes flourish because of systemic limitations within our schooling system as well as the gulf that exists between the demand for quality educational seats and supply.

Thus unless larger systemic issues are addressed first, regardless of what the JEE morphs into, coaching classes will thrive in this mismatch between demand and supply just as in civil services, medicine and management.

The problem with Multiple Choice Questions

The large number of students appearing for JEE has forced the examination to be of MCQ type which does not necessarily test the students' ability to solve complex problems as the long-answer type questions would and it does certainly encourage "guesswork" by students through a process of eliminating some of the incorrect options. This is a valid issue and can be addressed by making it hard to eliminate answers and with deductions for wrong answers.

Student "Burn Out" & Stress:

An equally disturbing result of the fierce competition the JEE embodies today is the "burn-out" syndrome among the students who enter IITs. After a grueling minimum

2 years in preparing for the JEE, a distinct tendency to take things easy can be spotted among recent students, which at a later stage converts itself into alienation from engineering itself.

Today, IIT faculty are seized of these issues and have been working on various suggestions to modify the JEE with an objective of selecting the right types of students into IITs and to minimize such disconnect.

It is against this backdrop that one must view and assess the suggestions made by MHRD.

CHANGES SUGGESTED BY MHRD IN JEE

Ministry of Human Resources Development (MHRD) constituted a committee under Dr T. Ramasamy (Ramasamy Committee) which has issued a set of recommendations. The changed pattern is to take effect from the year 2013.

1. A common entrance test will be conducted for all Centrally Funded Technical Institutes (CFTIs). The test will give weightage to the board exam marks of 10+2 examination. (Minimum weight recommended 30%). In order to cater to the differences in grading/marking systems followed by different school boards, a process of normalization would be followed. This would be designed with advice from Indian Statistical Institute (ISI), Kolkata.
2. The main test will have two parts – Aptitude, which will test the fundamental understanding of the candidates, will be an MCQ type test amenable to computerized checking. The second part will be the Advance test which will be of MCQ type with multiple correct answers to minimize the “false positive” results.

MHRD seems to have based their recommendations on some underlying assumptions.

The stated ones, both officially as well as in different forums, are given below:

Students appearing for JEE tend to neglect the Board studies and concentrate on the JEE. As a result, their performance in Board exams suffers.

Students are at present subjected to a number of admission / entrance tests which causes stress and consequent maladjustment of many (unsuccessful) students.

JEE coaching classes have proliferated due to stress in the JEE. These classes charge very high fees and therefore the success in JEE is skewed in favour of students from the Urban/Rural Upper Classes.

Each of these along with the MHRD’s expectations are reviewed and responded with recommendations.

OBSERVATIONS AND COMMENTS ON THE MHRD PROPOSAL

At the outset it must be stressed that The Institutes of Technology Act, 1961, empowers the IIT Council to be in charge of all matters related to academics and admissions. MHRD, therefore, should have submitted their suggestions to the Council and have these suggestions debated in the Senates of each IIT. The Council would then receive inputs from all IITs, consider the matter, and recommend the course of action to the MHRD.

The following considers the MHRD plan only to the extent of suggesting what changes must be incorporated in revised plans that the MHRD might offer at a later date:

The Shortcomings of School Board Examinations:

1. **Unsuitability:** IIT faculty and alumni are overwhelmingly of the opinion that School Board syllabus and method of testing do

not reflect the suitability of the candidate to undergo a rigorous course like IIT. School Board promotes rote learning and does not encourage analytical thinking that is required to tackle complex problems.

2. Open to Favouritism: The School Board examinations normally have a component of marks for practical examinations, which are entirely dependent upon the supervisors and have been known to be misused. With these marks being counted towards the selection to IITs, these are most likely to bring in a lot of malpractices.

3. Malpractices: The School Boards are notorious for malpractices during examinations and assessments; little credence can be attached to the marks obtained by a candidate.

4. Timing: The engineering admissions follow a regular pattern. The IIT results and admissions are completed first, and then the students who do not make the cut opt for 2nd tier institutes such as the National Institute of Technology's and other central institutes. This is then followed by state engineering admissions. If some year the Board results are not available in time, it will delay the admissions process not only for IITs for the whole chain that follows it.

5. Litigation: Examples abound where students or parents unhappy with the Board result have moved court and consequently withheld the entire admissions process in that State. Admission to IIT will be impacted with such contentions.

6. Reassessment: The School Boards are also inundated with applications for revaluations, which will have an impact on the students' ranking in the JEE.

7. Normalization of Board Results: Weighting the normalized results of 40+ Boards will be error prone and opens up the possibility

for manipulation of JEE results and ranking.

8. Students taken by surprise: Implementation of this scheme from 2013 will negatively impact the candidates who plan to appear for the 2013 JEE, as they would have already started their preparations based on the current pattern.

Recommendations:

1. The School Board results should be taken as a "pre-qualification" for JEE and a reasonable cut-off should be prescribed. This will ensure the main contention of MHRD that the Board studies should not be neglected by the students. This can be immediately put into effect from 2013.

2. Additionally, this will also ensure that any changes in the candidates' marks in Board exams after rechecking / re-assessment do not affect the rankings in JEE.

3. The Board results of all States must be declared in time so that the cut off considered for the IIT admissions can be applied. If a single Board result is delayed and not available in time, then the entire exercise of using the "cut off" to pre-qualify should be abandoned.

4. The details of the suggested normalization procedure should be made available in the public domain and to the IITs to elicit comments and suggestions.

A Closer Look at One Nation One Test Objective:

Currently the number of aspirants for IITs is about 5 lakh. Around 10 lakh appear for All India Engineering Entrance Examination (for admission to NITs and other Centrally Funded Technical Institutes). This number is expected to swell significantly and managing the testing of these many students will present unforeseen challenges.

Holding a single test results in a “Single throw of Dice” situation that can make or break a student’s entire life. Instead, holding multiple tests give the student multiple options which they can manage to suit their aspirations. For example, if these tests are held in close proximity then a student can prepare once and appear for multiple tests to expand their options. Or a student can target a particular test that suits their level of competency.

Consequently, one test for the elite Institutes, the IITs, one for the NITs and possibly a third for the rest, each managed by their faculty, would result in a better set of choices for students.

SAT/GRE/GMAT have often been quoted as successful examples of single test scores that are universally accepted and used by US universities to select applicants. The fallacy in this argument is (1) these scores are not the sole criteria by which a student is selected (applications include essays, recommendation letters, personal interviews etc) and (2) the number of students applying are nowhere near the numbers faced in India. Citing what works in the US to justify a process for the Indian context is impractical.

Recommendations:

1. It is clear that the One Test One Rank system is not in the interest of the students and does not guarantee a proper selection of candidates.
2. A common test that will generate a score for a candidate can only be introduced to serve a limited purpose of establishing his/her eligibility for higher level examination.
3. A detailed survey of parents/students who ultimately have to face these multiple tests must be undertaken to establish their prefer-

ence in this regard.

4. In the interim it is suggested that the different tests being offered currently be coordinated and held in close proximity of each other so that the aspirant can prepare once and appear for multiple tests.

Structure of the Suggested Test (ISEET/NST):

A stated objective of the MHRD is to reduce the importance of private coaching, which admittedly would tend to skew the results in favour of urban/rural upper classes. However the solution suggested ISEET/NST which will consist of Board exams + Aptitude (Main) + Advanced is unlikely to be more “inclusive”. Coaching classes will adapt to whatever is prescribed, and in this case towards “integrated” coaching which will mean students will receive tuitions in all 3 aspects of the selection process. The suggested new pattern is likely to subject the students to far more stress than the current one as all three components require different mindsets.

Recommendations:

1. Coaching classes are here to stay, but the advantage they give students is an issue that still presents a challenge.
2. It is a battle of wits and ingenuity between the coaching classes and the IIT faculty to neutralize such an advantage and that challenge is best left to the faculty of IIT to address.
3. Furthermore the world is changing and the needs of the Industry and the Nation need to be addressed. This is a debate/discussion that is needed to tune the JEE in order to admit students with the right aptitude, inclination and competence without diluting the “excellence” criteria.

LOOKING AHEAD

There is a saying: if something is not broken, then don't fix it. The JEE has served the IITs and the country well. Furthermore, the IITs are already aware of the shortcomings of the JEE and their Senates have been charged with designing a better JEE.

The pitfalls of experimentation are many and their effects could be profound. This is not something to be taken lightly and in a cavalier manner. Recommendations from the various IIT Senates, should be widely debated before the same are accepted after due modifications. Any change of this magnitude which would affect a generation of students must be well thought out and tested before it can be brought into practice.

The solution to students not paying attention to Board Exams is not to make it count in the JEE. The answer is to impress upon the students that they need to do well in their Boards in order to be eligible to take the JEE. The Acharya committee has already lined out the prescription for State Boards. This should be implemented successfully before considering the next steps.

Changing the JEE without addressing concerns on the role of IITs in serving the Industry and the Country is like putting the cart before the horse. It is only after light is shone on these issues with an acceptable set of goals that it would be worthwhile for the IITs, through their JEE and GATE, to bring in a different set of students with an orientation to address these goals. That is more important than quibbling about the JEE.

IN CONCLUSION

The takeaway from this debate can be summed up as:

The IITs have been given the autonomy to design their selection process and it has worked well for the past 50 years. The result

is as plain as day light for everyone to see.

The IITs cumulatively are a world class brand which is the face of India wherever one goes.

The JEE has not been a static system and has been evolving with the needs of time. IIT faculty over the years have demonstrated excellence in critically evaluating JEE (and other aspects of the IIT system) to carry out the course correction as warranted.

Any future changes in order to be successful must come through their internal processes.

This debate has certainly proved to be useful in that it has forced the IITs to take a look at themselves, and certainly whatever changes it would bring about would take what is excellent and make it even better. ●

India's Education System: Doing a 360

Kishor Kulkarni

“Genius without education is like silver in the mine.”

- Benjamin Franklin

India with such vast demographic assets has a lot of raw talent. But without proper education, its potential remains untapped. If we have to achieve high economic growth that is simultaneously inclusive so as to bring social justice and equality, then the Indian education system must be much more of an effective enabler than what it is today.

The fundamental problems with our current education system have been discussed very often by many people on many different platforms. This article, therefore, focuses straight-away on the many fundamental changes in the education paradigm that are the crying need of the day. Let the reader be warned that the changes proposed may appear quite revolutionary and possibly upsetting for the establishment.

At the heart of this proposal is the principle that each child is different in her own way. As such, the educational needs of variously endowed children are quite different. Unfortunately, our present education system works like a forging hammer that beats every child into a standard size and shape, killing all originality and unique abilities of different children. There is no recognition of the fact that each child is like a seed that has to grow

Our present education system works like a forging hammer that beats every child into a standard size and shape, killing all originality and unique abilities of different children.



into a tree of its own kind. In fact, the schools and teachers should act as facilitators, a bit like what appropriate soil, adequate watering, enough sunlight and the right nutrients do to a growing plant.

With this background, the need to review the whole education paradigm thoroughly cannot be emphasised enough. Here are a few broad principles that should form the contours of a brand new education policy:

1. Children up to the age of 12 are like a sponge. So they should be allowed to soak in as much of the real world through direct exposure and experience as possible, during the initial phase of primary education up to 7th standard. The focus of this phase should be on general knowledge about real life that the children are a part of. Rote learning and regurgitating in the examination papers should be totally avoided in this phase. There should not be any evaluation by way of examinations during this phase. A child complet-

The present strait-jacketed systems of a few standard qualifications like SSC/HSC/B.A./B.Sc./B.Com. should be abolished.



- ing this phase should be given a Primary Education Certificate on the basis of an evaluation that is not memory-based, but focused on assessing the level of awareness of the child.
2. During the secondary education phase, children should be imparted basic knowledge and skills in art, craft, science, mathematics, computers, literature, working in industry and commerce, etc. A major shift in the paradigm, moving away from standardisation of curricula and institutions and towards as much variety as necessary and possible, would do a world of good to the overall quality of the students coming out of this phase of education. For this, the present strait-jacketed system of a few standard qualifications like SSC/HSC/B.A./B.Sc./B.Com. should be abolished. Instead, let there be a large number of short-term courses on offer, relating to various fields of study. These courses can be graded allowing a student to obtain different degrees of proficiency depending on his or her inclination and situation. A student should be allowed to collect credits in the form of certificates by doing the courses that he or she wants from one or many different institutions. The employers will evaluate a candidate's portfolio of such certificates and employ him or her suitably. There will be no fixed duration for this phase. An average student not keen on pursuing further education should be able to get a gainful occupation as soon as he or she acquires appropriate certificates of proficiency required for a particular job or self-employment. This phase will allow the students as well as their parents and teachers to ascertain each student's aptitude and liking. More serious students can go ahead with tertiary education.
 3. Tertiary education should be meant mainly for those wanting to be serious professionals in specific fields, or academicians and researchers. Constructive and close cooperation between educational institutions and employers should be encouraged, so that the courses and curricula are oriented towards the needs of the employers. In fact, it would be a good idea to encourage business houses to set up their own institutions with primarily their own job needs in mind. Such institutions should offer job guarantees to their students. The recovery of fees from needy students can be deferred until they start working.
 4. The education sector should be completely freed from government control. There should be total freedom for anyone to start a new institution, design curricula and courses, conduct assessments and award degrees/diplomas, fix teachers' salaries, etc.
 5. The government should shift its focus from quantity to quality. Let the government be a strong player in the education field alongside private institutions. The government can set the benchmark for quality by setting up and running a few quality institutions—just enough to force the private institutions to match the high quality standards set by the government institutions at reasonable fees.
 6. Create large capacity so that anyone wanting education is not deprived of the opportunity. Then there would be no need

Constructive and close cooperation between educational institutions and employers should be encouraged, so that the courses and curricula are oriented towards the needs of the employers.



for the socially divisive reservations.

7. Needy students should be provided easy loans at low interest rates.

For bringing about such fundamental paradigm shift, a strong push from the highest political level would be necessary. The RTI Act was passed despite a not-so-enthusiastic establishment, only because of Sonia Gandhi's personal keenness. All the right meaning people should present a powerful new education proposal along these lines to her. ●



Kishor Kulkarni

*Kishor Kulkarni
B.Tech. (Mett. Eng),
'75 worked for a
year in foundries*

after his graduation but later moved to the banking sector, where he worked for 11 years. He followed this up with 18 years in the software sector, before hanging up his boots at the age of 53. Kishor is now into spiritual pursuit! All in all, a typical IIT trait – a restless soul!

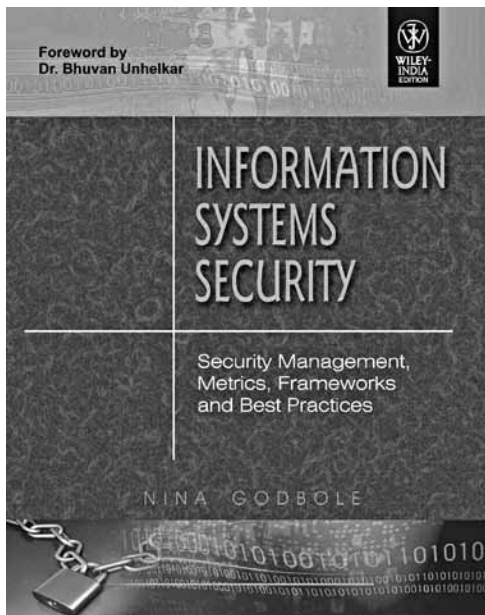
Information Systems Security

by Nina Godbole

(Published by Wiley India)

Reviewed by Sunit

Belapure



“The greatest gift is a passion for reading. It is cheap, it consoles, it distracts, it excites, it gives you knowledge of the world and experience of a wide kind. It is a moral illumination.”

– Elizabeth Hardwick

While reading this book, a reader gets engrossed into the subject and forces him/her to stretch their thoughts towards lucid understanding of information security domain. One can not be able to leave the book without completing the chapter and/or a specific

section/ domain, till the last word.

Although Information Security is not a new era now-a-days, very little awareness is observed in the business world. One of the reasons could be, there are not many books on Information Security written by Indian Authors and published in India, so that the text is available to the practitioners as well to the aspirants at a reasonable cost. While this book is published in India, the efforts are made thinking the global scenario by the author to produce a book for the study of sedimentary successions in the field is commendable.

Information Security is a very vast subject, so, becomes challenging to address each and every aspect with enough justice. Author has managed to do this without compromising the quality of the discussion. An author is successful to make a fairly comprehensive book in a seamless fashion, with the help of 38 Chapters, divided into 7 domains.

Each chapter of the book is arranged cogently and clearly. The chapter begins with “Learning Objectives” and ends with “Summary” and “Review questions”. “Further Reading” at the beneath of each chapter opens the wealth of knowledge to the reader.

Describing the concepts graphically is one of the key aspects of this book, with 250(+) figures, along with 50(+) tables and 175(+) vignettes. This makes the book useful to understand the concepts for the aspirants who are keen to build the career in Information Security Field and also for the speakers / presenters (Teaching Professionals)

Part I (Introduction) [6 chapters : 100 Pages]

The section begins with the History, Basics and Impact of Globalization on Information Systems and ends with gaining the understanding about InfoSec Risk Analysis. The reader gets charged and involved in the book

while going through Chapter 3 on Security in Mobile and Wireless Computing. Similarly inclusion of complex topic like LDAP, a topic in itself, has been handled by explaining it in a concise manner from security perspective.

Part II (Physical and Environmental Security) [4 Chapters : 65 Pages] – After creating a concrete foundation about Information Security basics, the author took the reader in this section, about “Physical Security” and “Perimeter Security”. The reader will enjoy while going through the last two chapters on “Biometrics”, discussed the topic in the context of perimeter security and open issues. Devoting two chapters on Biometrics found to be a novel and valuable contribution.

Part III (Network Security and Logical Access Control) [7 Chapters : 145 Pages] – The technocrats as well as aspirants will love this section while touring into technology forest. Separate chapters dedicated on Network Fundamentals, Cryptography, Intrusion Detection Systems, Firewalls, Virtual Private Network and Wireless Networks, maintained the flow of the section and have been given full coverage about networking concepts and security concepts.

Part IV (Application Security) [4 Chapters : 83 Pages] – Apart from the security perspectives about Business Applications, Databases and Operating Systems, which are well explained in distinct chapters, awesome efforts are found to cover Email Security in a dedicated chapter, a topic which is always given less importance and/or ignored in Information Security domain

Part V (Models, Frameworks and Metrics for Security) [6 Chapters : 135 Pages] – This section is one of the main pillar of this book. Going through this section is comprehensive education about implementing the various frameworks, models, standards and methodologies (like ITIL, IA-CMM, BASEL II,

OCTAVE and OSSTMM) into an organization. Individual chapters on “ISO 27001”, “SSE-CMM” and “COBIT, COSO and SAS 70”, which are widely adopted and practiced in the industry, provides an insight to the readers. The reader will also get an overview about laws and legal frameworks (IT Act, Sarbanes-Oxley, GLBA, HIPAA and FISMA) in the last chapter of this section.

Part VI (Privacy) [5 Chapters : 181 Pages] – A clear vision of an author should be appreciated, after looking a distinct section on “Privacy” – Primary security issue that affects most IT systems. Fundamentals, Business Challenges and Technological Impacts are very well covered in the individual chapters. Last chapter focuses on Web Services and Privacy from the viewpoint of security and privacy aspects in the Internet and SOA (Service Oriented Architecture).

Part VII (Security Best Practices) [6 Chapters : 217 Pages] – Including practices on Staffing, BCP/DRP and Asset Management, the reader will also get an understanding on “Ethical Issues/concerns about Intellectual Property” in the last separate chapter. “Auditing for Security” chapter explains the entire components of an IS Audit domain, covering Process based aspects as well as Tool based Audits.

Conclusion – The author has well utilized her entire knowledge base and enriched experience into this book. Including case illustrations and appendices on a CD will be very much appreciated by the readers; especially the practicing professionals in the Information Security domain. Although this book is not based on any specific university course, can be very well instrumental as a text book for various university courses and certifications (e.g. CISA / CISSP / CIPP and many more) as well as an addition of this book on the bookshelf could be a very good reference for the experienced practitioners. ●

‘Shor’ n’ Merry Mood in Goa

*Eastman colour, 35 mm, directed by IITBAA,
Produced by Manohar Parikkar and Music by
Rui Lobo*

For IIT Bombay Alumni Association our Chapter leaders are our last mile of contact with alumni and although they have been working tirelessly for the cause of their alma mater and their Association for close to a decade there had never been an All Chapters Annual Conclave.

On deranged organizers, insane timelines and audacious goal setting..

So in one of those late night con-calls someone came up with the ‘bright’ idea of the Annual Chapter’s Conclave. Manohar Parrikar, Manu (his fond nickname among the IITB alums) had extended a blanket invitation to us all and given a date too (30th June) and this lunatic proposed that we should utilize the opportunity to hold the Chapters Conclave, never mind the fact that we were well into June and this would constitute criminally short notice; or other minor pesky details like finding funding, the near impossible organizational challenges etc. All of us suckers seduced by a great idea just ended up saying ‘yeah sure why not ...Let’s do it’.

If a few of you doubting Thomases are still questioning the degree of our insanity...take a look at the sheer audaciousness of what we planned and the goals we set.. Within a fortnight we wished to not only reach out, cajole, coerce and corral a sizable body of our chapter leaders at Goa but also invite their inputs on a host of issues related to the

IITB alumni movement. After that we had to collate it all into a single comprehensive document (there were over 70 detailed and meticulous responses to our questionnaire to sort through and process) and share it with the all before the conclave. We wished use it as the base for ideating from which we hoped would emerge some common tangible action items and a road map for the coming years for IITBAA and its chapters.

If this was not enough, we wished to serve the alma mater by strengthening IIT Bombay’s linkages with the Government of Goa (after all we had a alum as the CM) and facilitate opportunities for IITB alumni (and the organizations they worked for) interested in business investments in the state.

If you are tired after reading that exhausting laundry list, spare a thought for us who had foolishly taken on the task to deliver on all these counts!

What followed was a fortnight of multiple ‘night outs’ on the phone with feverish planning, inviting vetting, and collating business proposals, booking, ticketing, frantic e-mailing and finally, ending up in breathless anticipation in Goa. It is a testament to the commitment of our chapter leaders that more than 60 showed up despite the fact that they got less than ten days of prior notice. Not only was every Indian chapter represented at the Conclave but in terms of geographical



On Sabudana vada, H3 and more

representation attendees spanned from far off Australia to New York.

Goa was an inspired choice and we kept reassuring ourselves that if all else failed Fado and Feni would keep everyone happy. The Conclave was officially to start on the 30th but trust smart IITians who showed up a day early to meet, greet and break the ice

Collaborative volunteerism to weave a movement tapestry

30th morning dawned with stormy skies across Goa but thankfully it was all smooth sailing at the Goa International Centre. After an hour of tongue in cheek humorous introduction the chapter leaders got down to the serious business at hand. The inputs we had received from Chapter volunteers from the world over had been compiled into a process paper.

The exhaustive round of discussions are being documented and compiled at the moment but suffice it to say that we discussed and agreed on structuring a common minimum programme, creating interest specific virtual chapters instead of just geographical ones

and working groups of volunteers who would work on each of the areas proposed at the process paper.

The afternoon session on the 30th was devoted to interactions with Manohar Parrikar. With his winning smile and simple ways. Manu. Manohar Parrikar to some. CM of Goa, where CM denotes “common man” more than it denotes “Chief Minister”. Much has been written about his honesty, his integrity, his cool demeanour and his Spartan lifestyle. Less has been written about his sense of humour, but for those in doubt, he quickly demonstrated his ability by taking potshots at H3, PGs and quality of mess food. Topped it with a hilarious anecdote where he attributed his becoming the CM to the sabudana wadas of H4.

Apart from a session with all the gathered attendees there was more to be done which was more pointed and specific. The Goa conclave provided a golden opportunity to IITB to explore avenues to further strengthen IIT Bombay’s engagement with the state of Goa. During the last decade, IITB has worked closely with the state government on

various issues, and has signed two MOUs to formalize this engagement. The first MOU addresses general cooperation in Science & Technology in areas of mutual interest while the second MOU is to intensify the engagement of Goa Engineering College with IITB. As Dean Alumni and Corporate relations, Prof Ravi Sinha pointed out “Our experience in working with the Goa government during the last decade has been very positive, thus providing the foundation for exploring additional avenues of engagement”.

If the day saw lots of action, no one was done yet. Rui Lobo is a soft spoken mild mannered Goan who he did get an engineering degree from IIT Bombay. But what he is best at is making magic happen when his fingers touch a guitar. He was gracious enough to attend with some of his students to regale attendees with not just classical compositions but the plaintive tunes of the Local Fado. As the evening moved on Feni took care of inhibitions we discovered that there was more musical talent to be sampled the just Rui and his students. But no more on that all of us did make a common pact “what ever happens in Goa, stays in Goa”;-)

OOMF- One-on-One Meetings Festival

Done with digressing and back at the more serious matter at hand, the fact of the matter was that there was a horde of alumni and non-alumni entrepreneurs who wanted to do business with the state of Goa because it was now led by a progress oriented CM who wanted to meet each entrepreneur personally and invite them to contribute to Goa’s progress. Meetings were conducted over two days in a modest room adjoining the meeting hall at Goa International Centre. Hastily converted into a make-shift office for a Chief Minister who came without any PA, secretary or even a security guard. A 5 Ft X 2 Ft table was the sole embellishment in the

room that would open up the fortune of at least 21 alumni entrepreneurs, excited and incredulous, that a CM would actually sit there through hours discussing business ventures with them and help them set up shop in Goa. CM sat in the middle, DB sat on his right and BD sat on his left. (BD later rued the fact that he was being displaced as Manu’s right hand man)

Entrepreneurs stepped in, one by one, for their one-on-one with Manu. They walked in with folders in hand and hope in their hearts. Someone wanted to set up a 10 MW solar power plant. Yet another wanted to automate all panchayats in Goa with the help of biometric based smart cards. One had an RFID solution to tackle the mining mafia in Goa. And there was one who had a proven mechanism to generate employment and train human resources. Someone wanted to bring sports into school curriculums. Educational kits for the mentally challenged, narcotics detecting contraptions, technology for converting fly ash into sand substitute, setting up test lanes for driving licenses and fitness certificates for cars, portable video streaming devices for crime police, economical dialysis solutions for kidney failure patients who could now die peacefully and die cheap, web based solutions to manage water distribution system without digging for pipelines in your living room, policy implementation support for green-ifying Goa, setting up software parks and institutes of learning, managing land records and so much more. Innovative ideas streamed in endlessly. From a bunch of entrepreneurs who would not have had a chance in hell of reaching the smallest clerk in India’s babu-dom, leave alone a Chief Minister.

This was the day Manu would display traits that are much more than what he is famous for. Quick, responsive, efficient and a multi-tasker. Poured his black coffee himself,



read each proposal with a “vertical reading method” that he alone knows how to. Scribbled quick notes, stapled visiting cards to the proposal and packed it all in a folder himself. Asked the right questions...”What do you want from me and my government?”. “If I give you the order, when will you start?”

Entrepreneurs went back happy and joyous that happy days are here again. But they inflicted Manu with a lot of jargon. In between a wannabe educator and a governance policy maker, Manu decided to play “jargon. Jargon”. “Mere ku bhi jargon aata hai”, he told BD and DB. BD was hitherto playing the role of introducing Manu to the entrepreneurs, concealing the hostel number of everyone from H3. H3-H4 wars were legendary and fought on terraces when Manu was the general who delivered victories to H4. DB was a Goan who knew renal failure rates in Goa and educational policies which he relayed to Manu in some quick and concise Konkani. Coming back to this game called “jargon, jargon”, when BD sang out “I need an ashtray”, Manu grabbed a saucer, DB poured in some water and Manu then declared, “Voila! This is innovation. Samjha kya?”. A

challenged BD ran to the door, barked out an instruction, “Abbey Ashish! Ek ash tray leke aa.”. Ashish and a white ashtray materialized with a BD claim that this was “resource management”. It was jargon vs. jargon. Manu tried to claim victory over his “innovation” but Ashish’s laughter delivered it to BD fair and square.

End of the day, this was a match that had 3 winners and no losers. In the entrepreneurs galore, there was an enterprise that won the day. OOMF. One-on-One Meetings Festival. Facilitating one-on-one meetings with Manu and entrepreneurs was an enterprising idea from IITBAA that holds much promise. Entrepreneur will win. State of Goa will win. And IITBAA will win. ●

Prof. R. E. Bedford

1926 - 2012



Prof. R. E. Bedford, Professor Emeritus at IIT Bombay, passed away in Chennai on 25th June 2012, aged 86. He was a faculty member at IIT Bombay from 1958 to 1986, and was its Acting Director and Director during 1980-81.

After completing his Ph.D. from the University of Madras in 1955, he held a post-doctoral position at IIT Kharagpur before going to the University of Illinois, USA as a Visiting Assistant Professor. He joined IIT Bombay as an Assistant Professor in its early days -- September 1958 -- and became full Professor in 1966. He was Head, Department of

Electrical Engineering in 1964-1966, and was the Acting Director and then Director from August 1980 to December 1981. He retired from IIT Bombay in 1986, and was conferred the lifetime Emeritus Professorship shortly thereafter.

Prof. Bedford was one of IIT Bombay's most admired faculty members, held in high esteem by students, faculty and staff alike. A specialist in the theory of electrical machines, he laid the foundation for the country's pre-eminent group in this area at IIT Bombay. Prof Bedford had worked for his doctorate degree on the theme of prediction of performance of electrical machines using concepts of electromagnetic fields. Continuing this work at IIT Bombay, he published benchmark research papers on space-time harmonics and design of machines. Many students worked under his guidance for doctorate research. His book on electrical machines, co-authored with his colleague in IIT Kharagpur, was a 'bible' on machine theory in those times. Over the years, Prof Bedford migrated, with ease, to other topics like network synthesis and power electronics, thus straddling both the "heavy" and "light" current domains -- as they were then known -- of electrical engineering.

As an academic administrator, he led the Senate Committee, till today known as the Bedford Committee, which resulted in the

far-sighted academic re-structuring of IIT Bombay, which continues till today. He served as Acting Director and then Director with distinction for about 16 months in 1980-81.

Professor Bedford was a true scholar, pursuing knowledge for its own sake, and always interested in new ideas not only from his own field of specialization but other areas as well. He was well known for his Socratic method of teaching, using questioning and discussion to stimulate critical thinking. Students and colleagues soon came to realize that his quizzical doubts of various points of electrical engineering indicated not a lack of understanding, but rather the beginning of a deeper probing. He thus trained a generation of students and colleagues in non-dogmatic and open thinking, not only about technical matters, but about academic issues in general. He was one of a small band of influential faculty members in the formative years of IIT Bombay who created the ethos of an open academic environment, which continues in IIT Bombay till today.

Professor Bedford will be remembered by his colleagues and students at IIT Bombay as the quintessential gentleman, informal, warm and accessible, having a great sense of humour, and as a caring mentor for students and young colleagues. His informality carried over to his dress style. Once at an important conference, his colleagues remember that one of the captains of industry remarked, “What, Bedford, you’re in shirt sleeves!” To which Professor Bedford replied with his inimitable good humour, “If I may paraphrase Gandhiji, you are dressed enough for us both!” Professor Bedford also enjoyed many non-curricular activities. He was a puzzle solver par excellence, who routinely completed the (then difficult) Times crossword before the 10:30 am class. He will also be fondly remembered for his portrayal of Professor Higgins trying

to teach circuit theory to a recalcitrant Eliza (played by Professor Jimmy Isaac) in the IIT spoof version of My Fair Lady.

The legacy that Professor Bedford created during his years at IIT Bombay will live on in many important ways.

May his soul rest in peace. ●

*Written by his colleagues from the
Electrical Engineering Department*

Thank You

Kapil Sibal: Honourable Minister HRD. Your machinations brought out the argumentative Indian in us and provided us with lot of fodder for this issue. Inadvertently, you caused this issue to be delayed, but we still thank you.

Manohar Parrikar: You have never failed to amaze us as a CM (Common Man) of Goa. Your hospitality in Goa and hosting us for breakfast along with your H4 mess workers at the CM's residence was a memorable experience. Not to mention that amidst scores of VIP visitors, dozens of secretaries and hundreds of files and thousands of phone calls, you managed to give us 20 minutes of a memorable interview. Thank you also for forking out Rs. 500 to buy one year's subscription of Fundamatics. We assure you that you will come back for more.

Dinar Bhatkar: In between micro-managing IITBAA's inaugural Chapter Conclave at Goa, you found time to lead us to Manohar Parrikar and fill us in on some valuable background info that we would never have been able to lay our hands on.

Sanchita Rodriguez, Giriraj, Siddharth and Shailesh from CMO Goa: You kept raising your eyebrows when you saw the CM giving us so much time. Realizing (correctly) that we were somebody special, you facilitated a quick entry and an equally quick exit from the CMO every time we came calling.

Nibar Gokhale: Proof of the pudding is in the eating. But proofing Fundamatics was no pudding, as you realized the hard way.

Parasvil Patel: We made you open up geography text books and map latitudes and longitudes of God forsaken places. We then made you create 4 different versions of a map and we kept junking and un-junking. Finally, we told you that all your hard work was for something called "Totally Useless Trivia".

Webteam of IITBAA/IITBHF: You guys have become pros at hosting and conducting our popular Poll Khul Gayi-online voting station. This time, you added a comment box that allowed people to indulge in their favourite Sibal bashing frenzy.

Paparazzi: All of you love Fundamatics and Poll Khul Gayi. With bated breath and deep anxiety, you waited for this issue. We took pity and shared Poll Khul Gayi results with you before release.

Headlines Today: You were the first TV channel who thought that Poll Khul Gayi results should be aired on TV and you rushed with your OB van to the campus to take a live interview in IITBAA office.

Alumni entrepreneurs of IITB: This issue was devoted to you. But each of you convinced us that Fundamatics is the best entrepreneurial venture that has hit the populace in recent times.

Advertisers: For the first time, we did not send our extortion squads to your door. You came forward willingly and paid. We think that you are smart businessmen who understand ROI.

Deadlines: You know that we all love you and respect you. But we ignored you this one time, thanks to an outbreak of some controversies. Forgive us our trespasses. We'll meet you again in October.

Readers and contributors, past, present and future: Since you're the central meaning of our existence, we'll keep thanking you till it hurts.

Quote of the day: Fundamatics is a fashion accessory and a great gift article. Make sure you carry a copy at all times and hand out copies to everyone you meet during your morning walk.



Creative Bees at Fundamatics

Illustration



*Shreyas Navare
C'08, SJMSOM,
H-13*

*Shreyas Navare:
(C'08, SJMSOM,
H-13), Mumbai,
Senior Manager,*

Marketing and Corporate Communications at a private bank. He freelances as a Editorial Cartoonist for Hindustan Times. He has covered elections in 6 Indian states through the eyes of a cartoonist on behalf of HT. Shreyas has held many cartoon exhibitions, two of which were inaugurated by Dr. A. P. J. Abdul Kalam. His first solo international cartoon exhibition was held recently at Bangkok.

Design



*Anand Prahlad
C'07, IDC, H-8*

Anand Prahlad is an independent graphic designer and artist. When not design-

ing books, magazines, corporate identities or illustrating, he is an active gardener, culinary expert and amateur musician.

He runs www.thenewvitruvianman.com, where he writes and illustrates articles on design, gastronomy and music.

Photography



*Cibi
Chakravarthi,
IDC, H8.*

Architect and animator.

Has made numerous short films and runs his own studio in Kochi.

*Printed and bound at TRIKKON
trikkon_dp@rediffmail.com*





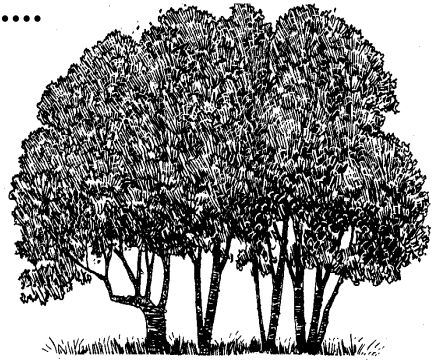
A CLEANER GREENER WORLD....

Though we seldom realise, our lives depend on Nature. Consider the contributions of greenery and forests to our lives. Trees act as wind breakers, stop soil erosion, and preserves the atmosphere, which is essential to every living organisms.

Forests play such a major role in our ecological balance. Man is steadily destroying this valuable natural resource.

By helping preserve our forests, we ensure our very own existence.

So, isn't it time we start conserving our forests?



Alkyl Amines Chemicals Limited

401, Nirman Vyapar Kendra, Sector 17, Vashi, Navi Mumbai 400 703. Tel: 022-67946600
Fax : 022-67946666. E-Mail: aliphaticamines@alkylamines.com. Website: <http://www.alkylamines.com>

A trusted name in chemicals



Rajendra D. Aphale

B. Tech., MMS, ACMA, LL.B.

rajendra.aphale@gmail.com

rajaphale@yahoo.co.uk

+91-9869 07 1521

+91-7738 59 1521

YOUR TRUSTED
**FRIEND AND
PARTNER**
IN STRATEGY
MANAGEMENT,
HUMAN RESOURCE
MANAGEMENT
AND LEAN.

To be the **largest contributor** towards education enrichment, skill development & employability enhancement in India.



Learning Technology Development
Learning Content Development
Educational Apps
ILT Training

S i m p l i f y i n g L e a r n i n g

GurujiWorld Technologies Pvt. Ltd. is an entrepreneurial venture with a mission to simplify the learning process for individuals by providing effective e-learning solutions. We have developed innovative delivery frameworks for e-learning contents catering to Computer Education, Spoken English, Vocational skills like Tally, and other skills like Cyber-crime awareness.

Our continuous endeavor is to improve learning tools with use of innovative technology, and make learning experience enjoyable, cost-effective and user-friendly. Our company is committed towards innovations in learning technology through continuous investment in its research and development activities for new product development and use of newer learning technologies.

Our sincere attempt is to bridge the digital divide across boundaries and contribute towards making India, eReady.

Educational Apps



Guruji Education Management Solution

An online and offline School Management Software on a Fully managed S-a-a-S model.

- Caters to 4 stake holders - School Management, School Administrators, Parents and Students
- Ubiquitous, Rich media User Interface
- Flexible integration
- Service architectures and web protocols
- Single point and Complete Education Management Support



Guruji Online Examination Solution (GOES)

Web based application for Schools, Colleges, Institutes, Corporate and Govt. Organizations

- On S-a-a-S or fully managed environment
- Power failure resume feature
- Quick Q&A upload facility in multiple languages
- View and analyze customized reports
- Define question quality and passing criteria
- Simplified pricing

MeraLakshya (powered by GOES)

An online mock examination portal powered by GOES framework, available on S-a-a-S platform. Exams will be made available on subscription basis.



Gsis Guruji School Information Solution

Web based application for State's Education Department Officials

- This application can be used by Cluster, Block, District and State Education Officers to compute and monitor the quality dimensions for various schools by capturing EMIS data

Soft Skills CBT

Guruji Spoken English Tutor

Computer Skills CBTs*

Guruji Computer Basics Tutor

Guruji Internet Tutor

Guruji MS-Office Tutor

Guruji Indic IME Marathi

Vocational Skills CBTs

Guruji Cyber Laws Tutor

Guruji Tally Tutor

Guruji Financial Accounting Tutor

K-12

- Our K12 contents can be deployed on LMS
- Innovative Flash player framework provides Animated Mentor, Notes for taking notes by users, Calculator or Trigonometry table
- Different reports can be extracted
- Quiz result analysis
- Keywords search feature
- Summary available for each Topic or Chapter

Guruji CBT features:

- Unique **dashboard interface**
- **Inbuilt LMS** to track learning process
- Highly **interactive & simple GUI** Screens
- Complete **Audio-Visual support** throughout
- **Easy navigation** through the Guruji Application Screens
- True Interactive and Simulated Applications
- Based on **DO-IT-YOURSELF** philosophy
- Hands-on Simulation lead to increased subject retention
- Training on demand & Repetitive learning
- Single Interface to launch **multiple languages**



*Available in Hindi, Marathi & English

Contact Information ▶

GurujiWorld Technologies Pvt. Ltd.

Fortune 202, 2nd floor, Next to Yashada, Baner Road, Aundh, Pune 411007, Maharashtra, India.

E-mail: info@gurujworld.com, Website: www.gurujworld.com Phone: +91.202.566.6350/6351



Reach the Beat of Millions



• 1522 screens

• 36 cities

• 200 million customers

Spread across 36 cities and over 1522 screens at Big Bazaar, Pantaloons and Central. Future TV is one of the most powerful vehicles at the hands of marketers, wanting to make an impact at the point of consumption. Not only does it reach a premium audience in the mood for commercial messaging, it can also be an effective driver for brand sales. But don't take our word for it.



The largest In-Store TV Network

To Advertise

Call: Bobby Mathew - +91 98202 32483
adsales@futuregroup.in

Vijay Koshy - +9198208 07726
www.futuremedia.in



EduSports is helping develop a generation of healthier & fitter children via the medium of physical activity & sports

Health Indicators



* Results among children in EduSports Partner Schools in Bangalore, Mangalore & Raipur

EduSports provides schools with structured tools that aid in the holistic development of children



Structured Nursery - 12 Curriculum



Age Appropriate Program Exercise Tools



Teacher & Parent Workshops



Periodic Assessments

EduSports is helping over 1, 50,000 children across 200+ schools get healthier & fitter

For more details visit - www.edusports.in or E-mail us at: soar@edusports.in





MAKING A SMART CHOICE IS AS EASY AS VISITING **BRAND FACTORY** AT THANE.

- 200 BEST BRANDS
- 20 TO 50% DISCOUNT
- 365 DAYS A YEAR

CHOOSE FROM

Formal Wear, Casual Wear, Denims, T-shirts, Ladies Ethnic Wear, Ladies Casual Wear,
Footwear, Sports Wear, Accessories, Watches, Eyewear And Luggage

STORE ADDRESS: THANE: Brand Factory, High Street Mall, Majiwada,
Kapurbawadi Naka, Thane-Bhivandi Road, Thane - 4112 7005
Store Timings: 11:30 am to 10:00 pm

 www.facebook.com/brandfactoryofficial

 **BRAND FACTORY**
BEST BRANDS • SMART PRICES

SPECIAL OFFER* FOR COLLEGE STUDENTS ONLY

Bring this Coupon along with your College ID card and get
₹100 off on purchase of ₹1000. Valid upto 30th September, 2012

Student ID No. _____

Coupon No. _____



968/11, Senapati Bapat Road,
Pune 411016, INDIA
E: info@neotechid.com
W: www.neotechid.com

- RFID/Barcode based solutions
- Outsourced software development for RFID/Barcode applications
- Integration with Enterprise applications
- 100 + satisfied customers in India and abroad

Our Products				
	Laptop Tracking	Asset Management	Material Management	Jewellery Tracking
Our Clients				
		Otis A United Technologies Company		GITANJALI
Our Partners				
		DCS & Labelling Worldwide		MICROSCAN

INSIGHT SOLAR

Developing human resources in **Solar Power in India**



Solar Resource Assessment System



Photovoltaic Training Kit



Solar Thermal Training Kit

ecosense

Delivering environment friendly mechanisms

Ecosense Sustainable Solutions Pvt. Ltd.
Corporate Address: C-131, Flatted Factory Complex,
Okhla Phase III, New Delhi 110020
Ph: +91 1146016794, +91 9910166999, 91 9899577454
Email: info@ecosenseworld.com Web: www.ecosenseworld.com

“ I CANNOT TEACH
ANYBODY
ANYTHING
I CAN ONLY
MAKE THEM
THINK”

Socrates

Butterfly Fields' Hands-On Learning in Science & Math is a fun and challenging project based curriculum that provides hands-on experience giving touch and feel that provides the confidence of applying knowledge in real life



Tel: (040) 30608888, (040) 27711020.
www.butterflyfields.com

Dear Readers,

Would like to introduce ourselves as a premier organization, specialize in photography and Videography for all types of events. We have worked with various prestigious clients since the last 10 years. Using creative photographers and videographers, the finest photographic and lighting equipment, we execute live setups on site, & create moments that are unique for each client.

Who We Are

Light & Magic is the first organization of its kind in India offering bespoke photography portraits and sessions. Talented photographers and professional equipment aside, we like to make your sessions fun and pictures memorable. We shoot both in our studio and on location depending on your preference. All bookings are by prior appointment and booking only.

What We Do

We provide our clients high quality portraits, in a friendly and professional environment. We deliver, all the time, an excellent customer experience with every contact. We create lasting memories, mementos and artistic communication material for our clients. We are a full service company, with makeup, hairstyling, and value added services like canvas prints, enlargements, restoration, and consultation for home interior setups available on request.

School photography, Portrait photography of families, kids, babies, matrimonial, professionals and more...

We shoot for all the top schools in Mumbai, Through Light & Magic portraits we help students preserve the unforgettable school memories. We shoot babies, families, matrimonial, professionals in our state of the art studio at Lower Parel West. We also have a mobile service, for portraits at home.

Event Photography

Our talented team of photographers & videographers are part of some of the most important events of your life, like baby showers, birthdays, engagements, weddings, anniversaries & more. We expertly capture the spirit of the event.
Where to find us



For Studio Portraits,
please call on 9967649269
studio@lightandmagic.com

School/ College Administrators,
please call on 8108502424
servicing@lightandmagic.com

For Events, Weddings,
please call on 9619544033
events@lightandmagic.com

For reprint orders,
please call on 9820833997
studio@lightandmagic.com

246, Kewal Industrial Estate, Next to phoenix Mills, S. B. Marg, Lower Parel (W), Mumbai 400 013, India. Ph : 022 67284000
www.lightandmagic.com



Ed Craft
People as focus, Quality as Passion

Learning Materials • Workshops • Consultancy



We believe that Learning should be Fun and Stimulating.

Our Products and Services are designed thoughtfully towards this end.

 *Ed Craft*

6-3-598/51, Anand Nagar Colony,
Khairatabad, Hyderabad - 500 004.

Phone : +91-40-23320936

E-mail : edcraft94@gmail.com

Website : www.edcraftindia.com

20,00,000 patients require dialysis in India
But only
50,000 have access to it.
What about the rest?

Bringing high quality dialysis to Tier II and Tier III cities



sparsh
NEPHRO CARE

www.sparshnephrocare.com
info@sparshnephrocare.com

Locations: Hyderabad Lucknow Varanasi Chandigarh
Dehradun Rudrapur Bangalore Udaipur



