IITMag

A publication of the IIT Madras Alumni Relations Office

Electric mobility has in recent years become prominent in environmental, economic and social terms. Electric cars and two-wheelers have become a reality thanks to new, more powerful rechargeable batteries. Such innovation can significantly reduce dependency on oil, make energy transformation more efficient, and drive marked reduction in CO2 emissions from transport.

INTRODUCTION

Dear Reader,

This is the inaugural issue of "IITMag", the IIT Madras magazine. It represents our first effort to bring out an Institute publication that can connect with our various stakeholders-- parents, students, alumni, faculty, society at large, GoI-- and do so in a manner that puts us on par with some of the University magazines around the world. The writing, editing, visuals, layout, etc. are all expected to be world-class, and your feedback on this inaugural (trial) issue will enable us to reach there faster.

The contents are designed to provide an in-depth view into major happenings on happens, even while providing a global context; feature creative outpourings of alumni and campus residents; provide an outlet to thought-leadership pieces; and, in general, inform and entertain. While we communicate with the outside alumni through various means, including e-mails and social media, these missives tend to be somewhat business-like in their tone and tenor. IITMag is an exercise in indulgence. Read it not when you are on the run, but have a few minutes to spare. These articles are not for consumption, but for savoring.

IITMag will grow in scope with future issues. This is but a teaser, a harbinger of things to come. We will have an Editorial Committee to ensure quality and consistency. There will be a printed edition, on subscription basis. We will make sure it is worth subscribing to. We will leave you wanting more....

Write to us and tell how you liked this issue-- the contents, the format. Your opinions will shape the future of IITmag.

With regards....

Prof. R. Nagarajan
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SUSTAINABILITY, GREEN ENERGY, & ENVIRONMENTAL CONSERVATION HAVE BECOME WATCHWORDS ACROSS THE GLOBE

When Tesla announced its new Model S in 2012, little did the automobile market know that it would sell 145,000 units in the first three years after its launch. Today, the car remains the market favourite in the electric vehicle space and Tesla is revolutionising the way the world understands transportation and mobility.

Green energy and environmental conservation have become watchwords internationally, influencing actions and decisions across the spectrum of industry and scale. Unsurprisingly, the automobile and transportation sectors are greatly influenced by this fast-emerging trend, with changes towards sustainable transportation promising to transform the ways in which people move, drive, and travel.

On a global scale, electric vehicles and plug-in transportation are unarguably the Next Big Thing. Studying the markets in Europe, a report by Amsterdam Roundtables Foundation in association with McKinsey & Company describes the atmosphere that reigns today as being "driven by government support, an improved offering of electric vehicles by the automotive industry, and a growing familiarity and willingness to buy on the side of the customer", increasingly conducive to the innovation that drives the flourishing of the market. If international trends are to be believed, electrified plug-in vehicles are on the verge of redefining how the world understands mobility going forward.

Much of this trend towards electric vehicles can be traced back to the consumer. The 21st century consumer lives in the Information Age, bombarded with the knowledge of ozone layer depletion, melting ice-caps, and the ever-diminishing fossil fuel base. Given this barrage of information, there seems to be an increasingly expanding section of the population, one that Amsterdam Roundtables Foundation calls 'trendy greens,' who are willing to move away from status quo with the assurance of environmental benefit. What is worth noting, however, is that this shift away from traditional forms of transportation is not limited to those "green types" who actively factor in the environment into their decision-making process. Electric vehicles today are also proving efficient for those worried about the total cost of ownership (TCO) of a vehicle, and are willing to change their travel habits provided it saves them that extra pinch on the pocket. Adding to these attitudinal shifts, cities around the world are going out of their way to incentivise the adoption of such alternative forms of transport, with, for example, the City of Amsterdam providing preferential parking to plug-in vehicles in dense urban areas and the City of Oslo allowing electric vehicles access to the much faster-moving bus or taxi lanes. Thus, around the world, electric vehicles seem the answer to every driver and passenger's woes. They promise a significant decrease in individual external social costs while also refusing to compromise on the ease and comfort of travel.

GETTING AROUND. THE ECO-FRIENDLY WAY.

Yet, even a cursory glance at the global trends of electric vehicle adoption reveals one thing – a telltale absence of India on the charts and lists that spell out consumer statistics. When describing their international customer base, Tesla's Asian presence does not even mention India, speaking instead of China and Hong Kong as leading the continental race. Reports aside, this conspicuous absence is evident even to the naked public eye. Except for the short-lived popularity of the Reva a few years ago, sojourns on Indian roads hardly ever bring one in contact with plug-in vehicles. Despite reports in the Economic Times arguing that "Tesla's battery operated cars too has piqued curiosity of many Indians, some even preferring the two year wait for the car, " the average Indian driver still seems to consider electric vehicles too expensive and/or unconducive to local needs. The country, it would then seem, is only readying itself to jump onto the sustainable transportation bandwagon.

2020 LAUNCH

The 21st century consumer lives in the Information Age, bombarded with the knowledge of ozone layer depletion, melting ice-caps, and the ever-diminishing fossil fuel base. These 'trendy greens,' are willing to move away from status quo with the assurance that it will benefit the environment.

This Indian process of preparation is once again two-pronged, driven in equal measure by both industry as well as governmental actors. Chief amongst these contributing factors is the central government's National Electric Mobility Mission Plan 2020 launched in January 2013. Aiming to bring about a paradigm shift in the transportation

SAVING THE ENVIRONMENT

space, the plan seeks to promote "hybrid and electric mobility in India through a combination of policies aimed at gradually ensuring a vehicle population of 6-7 million (vehicles)…by the year 2020. " Not willing to stop at this, the plan also hopes to achieve a certain level of indigenisation in this production, ensuring that the country is powerfully positioned to become a global leader in segments of electrical vehicle production. Under the aegis of this plan, the government has committed to promoting both demand-side and supply-side incentives as well as focusing specifically on research and development initiatives in the field. With the successful realisation of this mission, India seeks to not only provide environmentally-friendly transportation options to its citizens but also reduce the national burden on the country's oil imports. Socially and economically, individually and collectively, this move is heralded as a win-win situation.

It is against this background that the Tata group made their big announcement in May 2016. An electric car may soon be launched by the brand, with executives confirming that the company has "conceptualised an electric car and may be working with firms outside the group for the finished project. " Similarly, Mahindra & Mahindra has announced that it will follow-up the launch of the E20 electric hatchback with India's first four-door pure electric car, E-Verito. With these announcements being applauded in the wake of global trends and domestic energy demands, the Indian electric mobility market is still grossly under-supplied, offering a seemingly golden opportunity to those who can work around pricing limitations and infrastructure needs to tap into this emerging market.

Enter Ather Energy, a hardware start-up designing and manufacturing an electric scooter. Positioned to fully capitalise on the condition of the electric vehicle market in India, this Bangalore-based start-up is all set to create waves in the sustainable transportation industry across the country. Founded by Tarun Mehta and Swapnil Jain, both alumni of Indian Institute of Technology (IIT) Madras, the team today has a very clear, unwavering focus. With India proving to be the world's second largest two-wheeler market (only after China), they recognised a tremendous opportunity. The need of the hour, they decided, is to innovate, not invent. On February 23, 2016, the team at Ather unveiled the S340 to the public, a fully electric scooter made with components entirely designed in-house.

The next few years saw the team catapulting from success to success, from one high to the next, their graph never stopping or slowing down.

When Mehta walked into the Engineering Design department at IIT Madras in 2007, he was another freshman without an idea of what the next few years would have in store for him. After spending his first year walking the expected route of 'do it all,' he soon found his niche at the institute's entrepreneurship cell, Cell for Technology Innovation, Development and Entrepreneurship Support (C-TIDES), choosing to "drop the tags for more meaningful stuff" that eventually saw him emerge as the student head of the group. Writing of his experience for the institute magazine Chennai 36, Mehta reminisces on the opportunity to visit Stanford for an entrepreneurship meet-up during his time at college. "The fact that people could have the audacity to work on things as massive as 'downloading the entire internet' (Google), or 'organizing the entire web' (Yahoo), or 'building networked computers' (Sun Microsystems) while still living in their dorms was mind-boggling. " Thus was born the love for product start-ups, the passion for building, and the seeds for the path-breaking work that Ather would soon take on.

A graduate certificate, a campus placement, and an unsatisfying tryst with the new job followed shortly after, and Mehta was left wondering what to do. Propelled by batchmate and fellow product enthusiast Jain, he decided to take a leap of faith. The boys soon found themselves back in the Department of Engineering Design, in the office of one of their professors, asking for his support. On their way up to his room, they quickly brainstormed. What were they looking to do? What was the product they were going to pitch? What was their game plan? Close on the heels of the patent they had filed for lithium ion-batteries after graduation, electric scooters was the call.

The year that followed saw the duo slip into familiar shoes, finding their place within the institute community once again. Over the next many months, Ather Energy was uniquely positioned to benefit from the increasing focus on entrepreneurship that was building across the campus. With time, IIT Madras would top the charts of campuses which are most supportive of start-up dreams. This is perhaps most evident in the Economic Times 'Best on Campus' awards where three out of four other nominations had their roots within the campus. Between 2013 and 2014, Ather Energy took shape and moulded itself under the watchful eye of the institute ecosystem. Today, the company acts as a flagbearer to a powerful story of support, encouragement, and conducive environments, one that Mehta wholeheartedly attests to. "Insti provides a protective bubble. It helps us disconnect from the noise and distraction outside until we are sure of what we can do. It is not a safety net, and one must not get complacent, but the isolation on campus is brilliant to get things done," he recollects. The story of Ather Energy, it would seem, is the story of a great idea nurtured, encouraged, and catalysed by an external environment favourable to innovation and experimentation.

> In Mehta's words, "we went from designing merely battery add-ons, to designing battery packs, to designing scooter frames to finally designing the entire system for a smart electric vehicle."

The next few years saw the team catapulting from success to success, from one high to the next, their graph never stopping or slowing down. In Mehta's words, "the electric vehicle industry has a long way to go to become horizontally integrated and Indian companies were largely not well structured for vertical integration. We realised that if we got this right, we were sit-

ting on a gold mine. Soon, we went from designing merely battery add-ons, to designing battery packs, to designing scooter frames to finally designing the entire system for a smart electric vehicle." Three years after they launched in early 2013, Ather Energy has unveiled India's first smart electric scooter, bagged the 'Best on Campus' Award at the Economic Times Startup Awards in 2016, and attracted the attention of high-profile funders from across the country.

"ATHER HAS THE POTENTIAL TO BE THE TESLA OF INDIA".

Propelled today by a young team whose expertise across mechanical engineering, computer science, and battery technology culminates in cutting-edge ideas, the team at Ather is doing many things differently. The S340 is entirely assembled with components produced by the team and also hosts a touchscreen dashboard that offers a range of features including the ability to build a user profile and understand riders as they use the vehicle more. Over time, the team at Ather hopes to build a two-way relationship between the rider and the vehicle, allowing the scooter to respond and react to the needs of the user just as much as the user benefits from the quality of the product itself. Taking this a step further, this cyber-connected dashboard also allows Ather to carry out upgrades remotely in the presence of internet connectivity, avoiding the need to regularly physically transport the scooter to the manufacturer. While customers avail of door deliveries, the team has thought through every aspect of the ownership experience, from pre-booking online to post-ownership monitoring and communication by Ather. In an enormous vote of confidence, Mukesh Bansal, Co-Founder of CureFit and member of the jury at the Economic Times Awards, congratulated them by saying "Ather has the potential to be the Tesla of India. "

Yet, even the future Tesla of the country had to overcome its fair share of hurdles on the path to national adulation. For Mehta and Jain, the biggest obstacles came in the form of funding. Starting out only a little over three years ago, they had to make sure that their inflow of finance kept up with the pace of their dreams. As Ather grew from strength to strength, from one innovative idea to the next, and the team was geared up to dream big, the founding duo needed to ensure that the company did not face a cash crunch. Turning to the positive national policy trends for help, they applied to the Government of India's Faster Adoption of Electric Vehicles (FAME) scheme under the National Electric Mobility Mission Plan. This scheme assures incentives for electric and hybrid vehicles, allowing customers to benefit from lowered costs that manufacturers can then claim from the government. Following this, Ather got noticed by the Technology Development Board under the Department of Science and Technology, IITM as well as Mr. Srini V Srinivasan, the founder of Aerospike and fellow institute alumnus. However, it was only in late 2014 that the team got its big break and the going kept getting better from there on. At the turn of the year, Flipkart founders Sachin and Binny Bansal invested $1 million as seed capital, and a few months later, another $12 million came in from Tiger Global specifically towards investments in development, testing, production, and launch of the vehicle. Earlier this year, Hero MotoCorp came forward to further this growth journey, investing $30.5 million as Series B funding in the firm, allowing Ather to maintain momentum and cater to the expected spike in demand in the future. Today, the team is over 170 members strong and is also working towards building experience centres at various urban centres including Bengaluru, Chennai, and Pune.

THE S340 CHARGES UPTO 80% IN FIFTY MINUTES ON FAST CHARGING MODE AND CAN ACHIEVE A TOP SPEED OF 72 KMS/HOUR.

With the S340 expected to be priced on par with most premium scooters, the team is confident of creating a dent in the market. Lighter wheels, tyres and brakes have successfully significantly reduced the vehicle's weight, making it easier to control and more comfortable to wield on city roads. Moreover, the team has dedicatedly worked to improve charging speeds of the vehicle, resulting in, as Quartz India announced, "an electric scooter that charges faster than your phone. " From scooters that used to charge for eight hours to run at 25 kilometres/hour, the S340 charges upto 80% in fifty minutes on fast charging mode and can achieve a top speed of 72 kilometres/hour. This fast-charging, long-lasting battery could then be celebrated as a gamechanger, overcoming the biggest problem that plagued electric vehicles in the country – all too frequent battery replacement. Thus, with the S340, Indian customers seem to have struck a win-win chord – an environmentally friendly vehicle whose improved battery drastically reduces the total cost of ownership, allowing the 21st century consumer to make decisions that are both socially conscious and economically viable at the same time. Speaking of the Indian market, Mehta explains "electric vehicles are not a bottom-of-the-pyramid play in India. Customers want something exciting with good specifications. We were at a sweet space, balancing our engineering act with our product instincts. With time and energy, we were set to take on the task at hand." Tellingly, their first prototype bagged twenty-five pre-orders and thousands have shown interest before the company was even ready to kick off production.

Today, Ather Energy is perfectly positioned to rewrite the way sustainable transportation is understood in India. With the country witnessing a slump in the sales of electric scooters (an 84% drop from 100,000 in 2011-12 to 16,000 in 2014-15), the S340 may be what tips the scale. Targeting the premium segment, Ather is confident that Indian consumers will welcome the scooter, an answer to their need to stand out from the crowd as well as be cognizant of environmental costs. With the next 25 years likely to bring a tightening of carbon-dioxide regulations (Amsterdam Roundtables Foundation), Ather seems ideally placed to not only capitalise on huge market opportunities but also play an active role in promoting sustainable transportation and environmentally-friendly mobility in the country. Over the next few years, Ather could truly emerge the Tesla of India, building momentum to successfully influence not only the transportation and automotive industries but also the power and infrastructure sectors nationally. With the excitement building for the launch of the S340, Ather's growth curve could ignite larger trends and greater changes, eventually resulting in greener, cleaner transportation options and a significantly reduced burden on fossil fuels.

When Tarun Mehta and Swapnil Jain graduated in 2012, they were armed with two things – the love for building and the desire to work in the energy space. They were confident they would build a product company someday. There was, however, another dream; to build a legacy. With Ather positioned to spearhead the growth of the electric vehicle market in India, they seem to be headed in the right direction.

Foundation for the Future.

The recent national ranking has placed IIT Madras as the top engineering school in India. Rightly so. As a proud IIT alum, this well-deserved honor just reinforced what we always knew about our alma mater.

The institute has been a foundation for generations of alumni who have gone on to make a major impact in the world from technology to academics, from business to social impact.

An IIT education provides a solid base of technical education together with real world and extra-curricular experiences that builds skills that are handy in almost any situation. While knowing your differential equations and circuit diagrams are important; learning to make the point in a late night debate, working with people from diverse parts of the country and thinking on your feet trying to solve tricky problems are the skills that stay with you through your career.

More than ever, these entrepreneurial skills are needed today to meet the challenges of the future. The world is faced with daunting issues ranging from an accelerating population, to increased competition for global resources, and widening economic disparities. Today's graduates will have to come up with the new innovations to address them. Equally important, they will need to ensure those innovations create the intended impact by building the enterprises that will deliver on the promises.

Key Steps

The Institute has already taken several steps to ensure its graduates are capable of addressing such challenges. A few are highlighted below:

- Flexible Curriculum | It has experimented with more flexible curriculum to encourage students to explore new ideas.
- Projects Beyond Curriculum | It has provided opportunities within and outside the curriculum to take ideas and implement solutions – as projects or through new enterprises.
- Industry Collaboration | It has led the way to encourage collaboration with industry to bring ideas to market with its first of its kind Research Park.
- Incubators | Its incubators help nurture solutions to address rural, health and other social challenges.

What's Next

The recognition that IIT Madras has garnered from its peers has placed it on a national stage. It is time now for us to look beyond and think about the role we can play on the global platform. The future opportunity is to apply the same innovation, to bring about quantum changes in product economics, to build revolutionary business models that will provide affordable, universal and impactful solutions not just for the masses in India but serve as models for innovation across the globe. When I visit the campus, I see a full commitment from the leadership, faculty and students to step up to the challenge. If the alumni can come together and lend them their perspective, knowledge, experience and resources I have no doubt that IIT Madras will fulfill its promise.

India has already shown the way with affordable, high quality healthcare solutions in institutions like LV Prasad Eye Institute and Narayana Hrudayalaya, with low cost, ubiquitous cell phone access across the country, and with breakthrough medical devices like GE's $500 ECG machine.

When I visit the campus, I see a full commitment from the leadership, faculty and students to step up to the challenge. If the alumni can come together and lend them their perspective, knowledge, experience and resources I have no doubt that IIT Madras will fulfill its promise. IIT Madras can serve as the beacon for future world-changing innovation that leads the way not just within India, but globally.

“Arranged Love”

A short story by R. Nagarajan

On a Friday in July, Manasa’s parents informed her that they had been looking for sometime for a suitable boy, and had one or two in mind. They had the photo of the most suitable one at hand, and could she take a look at it? Manasa, being all of 25 and very much of marriageable age by Indian societal reckoning, was indignant at first, but being easily amused, soon was giggling merrily at the silliness. Since her teenage years, she had considered love a prerequisite to marriage, and had assumed that love would precede her own. But here she was, confronted in her own home by an arranged alliance.

She glanced idly at the photo. The boy was typical of hundreds she saw everyday at work and on the road. The only features that registered on her were the crooked eyeglasses; they were slanting left to right. With a few more peals of laughter, she tossed it back to her father, who caught it neatly with the reflexes of a retired cricket coach. Manasa drew her chair close to the sofa where her parents were sitting, and with great affection, informed them of her cherished belief that love was a preexisting condition for married bliss. Her parents listened with equal care and concern, and her mother leaned forward after a brief exchange of looks between them. “Manasa”, she said, “you’re quite right. Marrying someone you love would be terrific (though your father and I did have our marriage arranged, and look how happy we have been!). But you are 25 now, and haven’t found love in all this time. What makes you think it’s just around the corner?”

Manasa nodded in partial concurrence, but retorted, “True, Mom, but it maybe because I haven’t been looking. There have been plenty of guys whom I liked, who seemed to be my kind, who were nice to me… but I never pursued them further, nor did I let them pursue me. Maybe if I gave them, or myself, half a chance, something will click. I have to give it a try, otherwise I’ll regret is for the rest of my life”.

Mom and Dad exchanged another quick glance. It was almost like they had scripted these exchanges. It was Dad’s turn to speak: “Dear girl, you are right, as always. And we are right, as usual. I have a proposition for you. Take a month to look for a soulmate (that should be plenty of time, right, given that you have such a handy selection to choose from?) At the end of the month, if you haven’t found Mr. Right, you put your trust in us, and go with our choice. Deal?” Now, Manasa had always been a sucker for a sporty ploy, as her parents knew only too well. One time, her little brother had got her to munch on a grasshopper by betting her that she daren’t. Her parents were now playing the same game, but she didn’t mind. Manasa felt a tingle of excitement; the next month would be fun….

The next day (Saturday, but unfortunately a working day for her IT employer) dawned sunnily and steamily as ever in Chennai. Manasa spent a little bit more time than usual on her dress and makeup. She knew she was pretty, since everyone said so, and mirrors don’t lie. She was slim, bouncy, energetic, friendly, cute, gracious…. She sometimes embarrassed herself with her compliments. But everyone around her thought so too. She had three dress codes: churidar when she was being practical, sari when she felt like dressing-up, jeans and T-shirt when the playful mood took her. She normally used cosmetics minimally, just dabbing on some powder and eyeliner. That day, she added a touch of lipgloss, and went with the sari. Her hips didn’t lie either; she was well-versed in how to enchant the guys with near-accidental glimpses of her shapely navel. Medium heels, rather than the flats she habitually wore, completed the ensemble that she quickly approved on her reflection. She was ready to go hubbyhunting.

Manasa hopped on her two-wheeler, clipped her helmet on, and started to plan her approach to the eligible males in her life. Sudhir popped up first on her romance radar. The guy was a hunk, they had gone to college together, and wound up working in the same office after graduation. They always got along like sailors on shore-leave,which, come to think of it, worried her a little bit. Had they gone irrevocably far on the pal-pal side? Then there was Madan, a couple of years older than her but her subordinate at work. She bullied him mercilessly but fondly, like an older sister. He was a little on the mousy side, but she wasn’t sure if that was his true self. On the other end of the power scale, there was her boss, Chandru Sir, devilishly handsome, with a handlebar moustache to die for. They kidded around a lot, and she knew he wasa playboy, but like all good women, she was convinced she could reform him.

From her circle of non-professional friends, one or two hovered on the fringes of romance; at least, she could associate them with tender feelings, unlike the many boys in her friends & acquaintances circle who apparently thought of her as a gender-neutral source of mirth. She could ring up her vast network of girlfriends, and enquire about available brothers and cousins… Manasa figured she would need to tap all resources to fill the pool of potential grooms, and got down to it with typical efficiency and single-mindedness. She lined up lunch with Sudhir, tea with Madan and dinner with Sir. She thought of a bright idea— snap their photos with her cellphone so that she could study them later at her leisure… She was a great believer in her ability to read faces and judge character.

Lunch went well from a gastronomic viewpoint, but was less-than-satisfying on the romance meter. Sudhir was talking about girls, but clearly in a present-companyexcludedway. Manasa finally asked him point-blank what he thought of her as a prospective girlfriend, and he almost choked on his gobi. But once he had the hang of it, the idea seemed to intrigue him, and he proposed future dates to explore the concept further. She took his photo, fortunately before the incident with thecauliflower.

Tea with Madan was a nervy affair to begin with. He was calling her “Ma’am”, and trying to figure out if he would still have his job next week. But as they eased into it, and Manasa let it be known that she was scouting him as husband material, his demeanour changed, with some macho inclinations becoming manifest. She clicked him, and promised to carry the tryst further the following week.

Her boss, Sir, whom she met at his Gentlemen’s Club, was surrounded by a bevy of beauties, and the liquor flowed as freely as ever. You had to admit that the man loved women, a good starting point for any man-woman relationship. Once she announced her intentions to him, he became very circumspect in his behaviour, shooing away the girls (all except the sexiest one). He earnestly declared his amorous intentions to Manasa, and swore to give up (nearly) all other worldly pleasures if he could gain sole rights over her. She angled her camera shot carefully to leave out the girl dangling on his right arm.

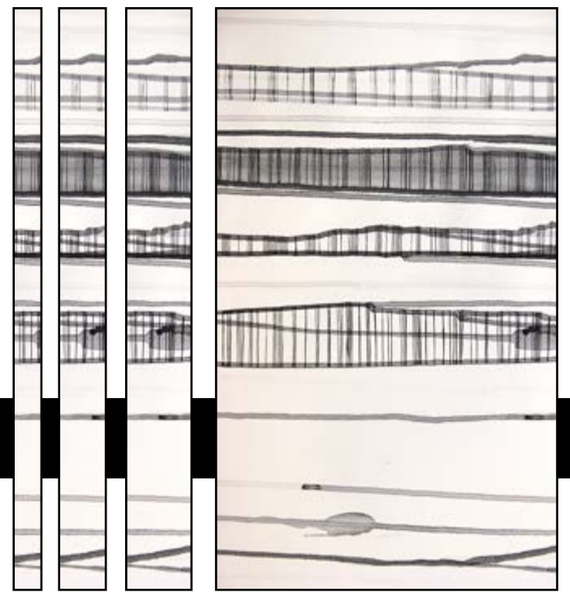
Over the next month, Manasa’s dalliances continued apace. Being a well-brought-up traditional Indian girl, premarital sex never reared its hoary head, and all her suitors respected that. As she met with some of the guys more than once, she started looking for that spark, that hint of something about to ignite. Sure, she had slapped Sudhir on the back when he was choking, but was that love? She would straighten Madan’s tie before a customer meeting, but that was just business protocol, right? She knew her boss’s every whim and fancy, and could cater to each, but that was just being a good employee, or was it more? The 28-year-old boy in their neighbouring house was always coming to her to vent his frustrations with a domineering father, and she would listen with sweet patience, but was that love in the offing, or simple goodwill towards a fellow human? Her best girlfriend’s older brother had escorted the two of them to many

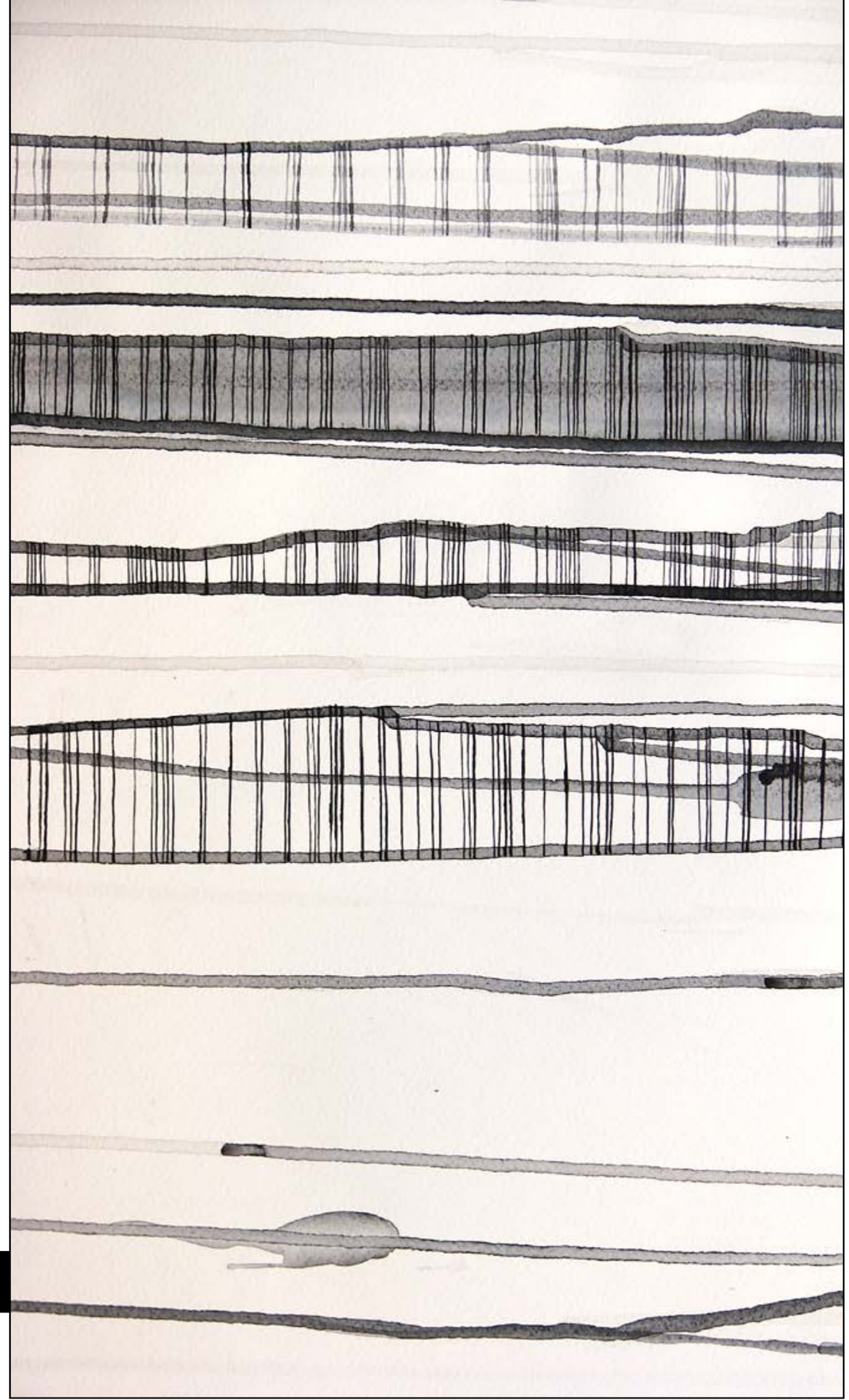
a movie, and bought her pop-corn and soda, but of such smallintimacies, is love born? Her own cousin, twice-removed, had the hots for her, and she had caught him peeking more than once, but wasn't that more like post-adolescent lust? Her photo collection was growing, and she started winnowing it after about 20 days. By the last week, she was down to about 8, and no, Madan was not one of them. Manasa thought she had felt something when she once met her cousin for breakfast at Woodlands, but it turned out to be heartburn from the spicy sambhar.

She flirted with the matrimony sites on the web, though her online forays mostly ended with her dissolving into guffaws. She admired these website honchos for their enterprise, but come on… If she wouldn't trust her parents to make her a match, why would she trust these internet kiosks to catch her a catch? Manasa would rather find herself a find all on her own….

She spent more time with her shortlisted beaus, looking for that magical connect. She liked them all a lot, but that missing link bothered her. She knew she loved her parents and her brother, because of a certain way she felt when she saw them after an absence, and a different (connected?) way she felt in their presence. However, when she was with these strangers who were not her blood-relatives, nothing seemed to run as thick as the blood. If love flowed, it was a thin stream. On the night of the 30th day, Manasi lay on her bed with the photos spread out before her in a smorgasbord. Sir, with the love-moustache; Sudhir, with the unruly cowlick; Madhav with the manic glint; Bharat with the beard; her cousin, with the perpetual leer; the neighbour boy, with the tilak on his forehead…. She studied them intensely, trying to make a karmic connection. Then, like the sensible girl she was, she decided to sleep on it.

As she opened her eyes on the 31st morning, one image—clear, indelible, undeniable—floated across her mind. The good old subconscious had come through again. She smiled at the delicious irony, and went to find her parents with a light heart and a cheery gait. Those darned crooked eyeglasses… she'll take him to a good optometrist the day after they got married….





A Partnership to Innovate

The role of academia in society has been evolving to create better linkages for solving societal problems. The United States, United Kingdom and Europe have created ecosystems that link government, industry and the older technology institutions for just such a purpose. This ecosystem manoeuvres technology solutions to the market place to solve problems of industry in particular and those faced by society in general.

In India our academic institutions serve the primary purpose of teaching; research is largely a secondary activity. The government of India however supports much of the basic research work and encourages taking the research output to the market place through agencies like Technology Development Board (TDB) and National Science and Technology Entrepreneurship Development Board (NSTEDB), among others. A further fillip was provided to funding opportunities through the introduction of the new Companies Act 2013, which mandates Corporate Social Responsibility (CSR) funding on leading companies across industry verticals, allowing them to play an important and significant role in innovation of technologies that can address quality of life issues across the nation. Specifically, Companies fulfilling any one of the following criteria must spend 2% of their profits averaged over the 3 previous financial years in the current year on a CSR funding: i) Turnover of Rs 1000 crore or more ii) Net worth of Rs. 500 crore or more iii) Profit after tax of Rs 5 crore or more.

This encouraging move has opened up several possibilities for industry institute partnership in socially relevant research and manufacturing. There are three distinct ways for academia to interact with Industry and benefit from their CSR funds. First, contributions or funds provided to technology incubators located within academic institutions are approved by the Central Government. The creation of Technology Business Incubators is supported initially by NSTEDB with the expectation that industry will subsequently support the established incubators through their CSR budget. Second, academic institutions can benefit from certain tax exemptions for industry funded research projects and also take the output to the field.

The Indian Institute of Technology, Madras (IITM) is committed to the mission of developing strong and sustainable partnerships with academia, industry and entrepreneurs. There is socially relevant and innovative Research and Development (R&D) underway at IITM in the areas of water purification, sanitation (household and larger scale), rural electrification using solar/DC supply, new generation DC motors, indoor air purification, various low-cost, high-tech health technologies, cost-effective housing, new pedagogies and many others. All are at various stages of development and implementation.

Third, academia can also design a CSR programme for a company based on its CSR policy – an effective way that academia and industry can collaborate to pool expertise and interests to address the country's civic issues.

The Act further permits companies to pool funds to implement projects giving scope for corporate houses to support very large projects proposed by academia. The guidelines further state that the mode of engagement with an implementing agency should involve projects/programmes with a long duration removing the need for companies to look for new CSR projects every year.

IITM has envisaged many socially relevant projects that require very large funding for implementation. For instance, the ambitious plan to use Inverter less Solar power to run Direct Current(DC) appliances in 100,000 homes. This implementation has started and currently nearly 4000 homes have been provided with solar panels that are used to drive Light Emitting Diode (LED) bulbs, tube lights, Brushless DC motor fans with provision to charge cellular phones and even run a DC Television or Laptop. The conventional way of using solar power involves conversion of DC to Alternating Current (AC). Many appliances like LEDs, Television sets, Laptops and cell phones are essentially DC devices and therefore powering them up with DC considerably increases efficiency and allows the use of smaller sized solar panels which reduce cost. By pooling CSR funding from multiple companies, it is possible to achieve the goals of the project covering the target of 100,000 homes on Inverter less Solar DC.

The newly instituted Development Office at IIT Madras raised over Rs. 10 crores in 2015 from corporate houses and other organisations to support socially relevant work being done on campus. IITM has been ranked the # 1 Engineering Institute in the country, an enviable status that applauds its capability and strength and clothes it with credibility and trustworthiness. Corporates do not have to look any further for a partner who can innovate technology solutions to solve the many problems facing our nation. Such industry–institute partnership to solve social problems can foist India on par with ecosystems of the developed world.

Joseph Thomas

List of socially relevant projects supported by CSR funding

1) Prototypes of footwear device for gait analysis and rehabilitation
2) Concept note on waste management
3) Capacity Building of producer companies
4) Innovative 'C-4' model for high school students
5) Empowering and developing women entrepreneurs: exploring the avenues
6) Bringing proficiency in English to slum and rural school children
7) Identifying hotspots of environmental pollution
8) Popularising Bharati script

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