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The 'Z' Axis - An Eye in the Sky



iF Team – L-R – Ankit ,Vipul, Ashish, Amardeep, Rahul

Back in 2006 residents of campus, while walking across the Main Building, might have chanced across a bunch of wild-haired boys flying a strange drone-like contraption in MB lawns. Apart from the occasional

curious look up towards the sky they may not have merited a closer look. Some of us did take a second more interested look when we discovered the same drone in the hands of Aamir Khan (playing a young whizz kid innovator) in the hit movie 3 Idiots.

What happened to the wild-haired boys after that brief flash of fame as they disappeared from the lawns? Does the bid to cut curricular monotony and following own heart find a happy ending only in the reel life world of celluloid? Or, is there a similar happy ending to be found in real life as well?

Noseybee dug out the real Phunsukh Wangdu behind the 3 Idiots story, a team of 5 young men – Ankit Mehta, Rahul Singh, Ashish Bhat and Amardeep Singh from IIT Bombay earlier this year. The crazy hairdos had been replaced by formal button-down shirts and sharp-creased pants and yes, they did follow their dreams and what happened afterwards is this,-their story.

Amardeep met Ankit in the summer of his first year at IIT. Ankit was his senior as were Rahul and Ashish. Even though they belonged to different batches and departments, a common interest in Robotics brought them together. Ankit was heading the innovation cell called UMIC while Ashish and Rahul were both involved in Techfest. Ashish had already acquired a reputation as a tech whiz kid who was the reigning Tsar of all the micro- mouse competitions at Techfest. Together they had participated in many tech competitions including representing India at Robocon, Beijing.

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Ankit graduated first (in 2005) and although he did take up a job, he quit soon after and returned to Mumbai to rope in Rahul & Ashish who were slated to graduate the next year. Together, they formally registered a company ideaForge (in 2007) and started developing some alternative energy products,- a hand-crank charger and a bicycle charger for mobile phones, both targeted for rural, energy- deficient markets.

During this time, Amardeep was still finishing his final year in Aerospace Engineering and his final year project was to build a UAV-Unmanned Aerial Vehicle (in 2008). During the same year there was an international competition floated by the department of U.S Military IITB aerospace dept approached ideaForge to build a UAV along with its students which could be a contest entry at the competition. It was also agreed that the Indian military and ideaForge would get together and participate in this competition. The IITB- ideaForge team won first prize along with MIT, USA in the hovering class of UAVs.

This was also the time when a fourth member joined ideaForge. Vipul, Ankit's school friend who had just returned from Switzerland after completing his MBA, was looking to start his own venture but decided to

join them. Amardeep did the customary placement office job interviews and had the requisite job offer, but he too decided to cast his lot with the ideaForge team. All the pieces of the puzzle had now fallen into place and the original team was together, all set to build and take their UAV to the market.

These were early days yet. The startup sentiment – celebrating the initial idea-high of entrepreneurship (after all they had just won a major international competition) still needed to get grounded into concerns of the realities of day-to-day operations, and yet always keeping those big-picture entrepreneurial ideals as the guiding light to overcome the mundane obstacles.

At this stage what team had was still a crude model and that too they were a start-up making a hardware product where the main customers were government organisations with longer timelines to market. To make the task doubly difficult, they had entered a market where most potential customers had almost no idea about the product that they were making and its numerous applications. The initial years were spent educating the potential customers about UAVs and their numerous applications. The marketing team of ideaForge spent valuable time doing hundreds of demonstrations at No Cost No Commitment basis.



An interesting little-known anecdote worth sharing here is that it was Dia Mirza who first read about their

drone in the newspapers and told Rajkumar Hirani about it. The ideaForge team was invited to fly it at the shoot at Bangalore and when we saw Aamir Khan flying the drone; it was with a dummy remote in his hand while the vehicle was actually being controlled from the background by the boys from Mumbai. They were at the initial stages of their venture and agreed to work for free for the publicity. Not a single penny was offered or earned from that shoot. Another colloid fantasy of a quick buck and fast fame dashed!

At this stage ideaForge was already incubated at SINE, IIT Bombay's own technology and entrepreneurship incubator. The team spent a lot more time at SINE than is usually given but while they needed the open skies of the campus to test and improve their product, they were also adding employees and fast running out of the space necessary for them to grow. So the team was forced to split with Ankit, Vipul and Amardeep working from new makeshift offices at Chandivali while the R & D team of Rahul and Ashish stayed behind at IIT. In hindsight this was a big mistake because every decision that needed team consensus took more time than before.

One also needs to keep in mind that innovation is no sudden flash of discovery, but a slow burn of dogged experiments and incremental improvements till you have a product ready for market. Long before ideaForge came into being, when Ashish, Ankit and Rahul were mere students, their first model was built without any sophisticated electronics, just motors attached to four propellers and a battery propelled by

little but hope that the machine could take off from the ground. The battery was exposed wired on the outside of the machine and once while testing it, all of a sudden and without any sort of intimation, the machine suddenly shot up and came tumbling down after cutting every wire around. It was a scary and scarring experience and it was a year before they could return to working on it again. Even when they finally built the first version of the UAV at ideaForge, called Zeppelin it was to go through many rounds of modifications and improvements morphing from Zep 1 to Zep 2 to Zep 3 to the more squarish structure called Carbon which was the closest to the current version called Netra.

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To match the best in the world and keep at the frontiers of tech innovation Netra even today is continuous work in progress with the R & D team working on continuous modifications and improvements.



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ideaForge team grabbed such an opportunity when they got a slot to exhibit the system at an exhibition at Pune even though they lacked the necessary funds to pay for an exhibition stall. This was when Zeplin was still work in progress between Zep 2 and Zep 3, and although the team got a lot of compliments there were still no orders. It was almost as if the tech geniuses who had pulled a ridiculous number of all-nighters problem-solving for a better product found themselves in over their heads as business people, and the story was going to end right there with an unpleasant thud.

Thankfully, around four to five months later, DRDO got in touch with them to suggest a collaborative partnership. The UAV became a collaborative product. ideaForge got the DRDO name and with it came greater credibility. The next time around when they exhibited Carbon in Delhi (in 2010), they were more assured. Not only did they avoid the usual path of working through middlemen so common in defence contracts, thanks to their IITB instilled self-confidence, but more importantly it was backed by a staunch belief in the quality of their product.

They got their first real customer after the exhibition in Delhi when the UP Special Task Force invited them for a demo and placed an order for Carbon through the tender process. The collaborative partnership with DRDO led to a rate contract with DRDO and Carbon morphed into NETRA – truly an eye in the sky. The rate contract not only acted as a reference for pricing to potential customers, but also helped in speeding up the procurement process.

Today three years down the road, NETRA is widely recognised in the industry as a revolutionary innovation in the realm of Homeland Security- a light-weight, autonomous UAV which can be used for intelligence, surveillance and reconnaissance of moving and fixed targets. The UAV can be used in anti-terrorist and counter-insurgency operations, hostage situations, border infiltration monitoring, law enforcement operations, and search-and-rescue operations and disaster management.

It took more than 7 years of continuous evolution, but NETRA's product features today are an impressive catalogue that includes the ability to stream real-time video of the target area with spotless clarity, fly up to 4kms with an endurance of 40-45 minutes. The use of lightweight carbon fibre composites in the machine means that it only needs two people to carry and operate the system in field locations. It flies by four high-speed rotors which permit a Vertical Take-Off and Landing (VTOL) providing the power to soar through the skies and enabling its operator to execute operational manoeuvres even in the most constrained flying environments. It is equipped with advanced programming of fail-safe modes both during day and night.

But none of these factoids can compare with the sight of this small but powerful machine that swoops up straight into the sky while you stand and 'look' through its eyes, feet still firmly fixed on terra firma. It convinces you that this is indeed the real McCoy not some gimmicky contraption wrapped in fancy packaging.

The original ideaForge team has now expanded to 35 members including R&D, manufacturing, admin, operations & marketing. Their manufacturing base is in Navi Mumbai where they manufacture, assemble, test and package the systems with streamlined processes and strict quality control in place. These are made-to-order systems and cannot be stocked in numbers, last year they sold 32 systems and have sold 70 of them in total since the first sale. In case you think that 70 is a small number you will soon change your mind when you hear the price tag that the little babies come with !! But let us just leave it by saying that this is one of those products which comes with the tagline “price on request”. The names of their numerous customers -at least the ones that can be shared in the public domain – include CRPF, Mumbai Police, Gujarat Police , Kolkata Police, BSF, NSG and UP Special Task Force. It was deployed by local law enforcement during a political rally in Chandigarh. Gujarat police purchased two systems and it was also deployed in July 2013 during the 136th Jagannath Rath Yatra. Ahmedabad became the first Indian city to use UAVs for crowd management by its own personnel followed by Kolkata which used it for Bhashan crowd management during Durga Puja celebrations in October 2013.

Not bad for a team of wild-haired dudes who ventured out with little but a spark in their eyes and a dream within their heart, right?

So is this the happy ending to the story we had started out looking for?

Not by a long shot. Every extra rupee they are earning today is still being ploughed back into the business. They have reached the roadblock that every successful enterprise hit at this stage of the game, the problem of scaling up and associated funding issues. Without quick capital inflows it won't take too long before it starts affecting other aspects of their business. So far their customer base has been confined to paramilitary forces, state police departments, armed forces and DRDO labs and although they have avoided paying a single rupee in bribes (defence contracts are notorious for them as we all know) by following a top-down approach of convincing the senior-most authority, having a non-mainstream product whose uses are still not fully understood invariably slows down the decision-making process and hence any eventual sale.

They have to also constantly battle the popular perception of a drone as a weapon of destruction. For instance, few people know that two NETRA UAVs were used in Uttarakhand by the National Disaster Response Force last year during the disastrous floods in Kedarnath for locating people.

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This was the first time that UAVs were deployed in a disaster rescue operation. The real-time monitoring of their video feed used on Kedarnath trail at Jungle Chatti & Gaurikund areas in the aftermath of the floods could help locate hundreds of survivors with precision.

While NETRA's defence applications are fairly straightforward there are other commercial applications where UAVs could be deployed successfully. Aerial photography, power lines monitoring, oil & gas pipeline monitoring, map generation, 3D terrain mapping, campus security, pollution checks, fire scouting, traffic management, monitoring large plantations, wildlife and habitat conservation to name just a few. One can't help but feel that the future for ideaForge and NETRA lies in this direction and large-scale funding will follow if the company works out a wider service model for their business in the commercial application space.

As we leave ideaForge at this stage of their story, one thing is obvious – more important than simply building a product, these are people who are in the process of architecting a company that in time has the potential to be much more incredible, than the sum of its parts. In a country long starved of any manufacturing success stories, theirs is an empowering tale of success in venturing into a space where few have dared to step before; an apt role model for thousands of bright college kids tinkering away at their colleges and institutions right at this moment with an entrepreneurial dream in their heart.

It is not mere accident that right at this moment there is a bunch of fresh-faced kids who can be found busy working away on a contraption at the IITB swimming pool. It is supposed to be an AUV – an autonomous underwater vehicle which is IITB's entry into a global robotics contest this year. Nor is it accidental that it is called MATSYA. Nosey hopes that the readers see the pattern here and that team ideaForge can feel some justified pride in their trailblazing role.

About



Noseybee

Noseybee pokes its nose everywhere not just to feel the aroma of the nectar but to supply the fragrance and the sweetness all over.

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