

IEEE Student Branch profile: Membership has its privileges

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The goal of any quality institution of learning is to provide its students with the tools they need to maximize their educational and personal growth. Students attending the Vignana Bharathi Institute of Technology (VBIT) in Andhra Pradesh, India, are treated to an expansive 13.5-acre campus that includes numerous state-of-the-art laboratories, ten of which are designated for the Department of Electronics and Communications Engineering, four serving the Department of Electrical and Electronics Engineering, and three labs for the computer science engineering and information technology departments. The school's library is host to over 9,000 volumes covering a diverse selection of engineering fields of interest.

But an education is much more than lab equipment and books—it's personal connections and new experiences. To promote technical awareness among its students and to help cultivate similar interests in the other colleges, the IEEE VBIT Student Branch (SB) was established in December 2006. The SB, which was initially formed with 42 student members, two faculty advisors, and an SB counselor, has grown to nearly 200 active student members. It has served as an effective platform to encourage and motivate students to participate in events and competitions as well as write and present papers at technical conferences.

One of the most significant challenges this young SB experienced was the question of whether it could sustain both its activities and its members. The branch constructed a four-pronged approach, based on the experience of its students, to ensuring its sustainability, according to Karthik Siddavaram, 2010 chair of the VBIT SB. First, "freshers" (first-year students) are introduced to the IEEE via membership awareness programs and organizing activities that were designed to specifically target freshers. The SB then provides a wealth of volunteering opportunities to help new members get a better understanding of the branch.



TREE © CAN STOCK PHOTO/KRISDOG

being discussed. This way, every student member is motivated to not only join the SB but also take an active part in its activities. We say that the present student members of the SB are a motivation for the upcoming new members and nonmembers. The student members are provided an opportunity to derive the maximum privileges from the IEEE SB at VBIT. This acts as an added advantage for the student members [and is] envied by nonmembers."

Talking the talk, walking the walk

Like many SBs, the branch at VBIT holds weekly activities, with the main objective of developing communication, analytical, logical-thinking, and reasoning skills. To fill in the gaps between in-person meetings and activities, the SB publishes the magazine *STU-talk*, which includes various issues and topics of relevance at VBIT. Each issue focuses on a specific theme.

In addition to guest lectures, workshops, and membership initiation programs, the branch produces a few signature events, the

Second-year students undergo training and are then provided opportunities to lead some of the branch activities. The goal is to prepare this group for further leadership roles in the coming years. Third-year students lead the SB operations and actively volunteer at the section level. These students serve as a bridge between the branch and the local IEEE Section. The final-year students assume an advisor/mentor role to the SB's executive committee and get involved in the Section-level activities. This creates role models and a path for the earlier-year students to follow.

"Each student member is treated as an integral part of the branch, thereby involving him or her in either the organization or participation of the many activities, programs and events that are conducted by the SB," explains Bharath Silagani, 2011 SB chair. "The student member thus gets a team experience alongside technical cognition about the technology



The IEEE VBIT SB is regarded as one of the most active branches in Region 10.

most popular of which is XYLYX (pronounced zy'lex), a competition that strives to bring together the most creative young talent in India. XYLYX, which means "perfection," is a result of the VBIT SB's work to furnish a platform for the students to exhibit their technical creativity, says Dr. Jayanth Kulkarni, VBIT vice principal.

"It is an annual event organized to meet new horizons of technology," Kulkarni adds. "XYLYX provides the students an arena to test and display their skills on a wide range of contests. The competitions at XYLYX test and inspire the students to think outside the box. Events are aimed at boosting the technical and managerial skills that are inherent in today's students and provide them with an opportunity to showcase their conceptual depth, innovative ideas, and presentation skills. XYLYX is the ideal place for students to interact and exchange their ideas and views on a plethora of subjects. Since its birth, XYLYX has been striving to be a center for converging creative talent across India. XYLYX has a rich mix of technical as well as nontechnical events."

Avishkar is another of the unique activities taken up by the VBIT SB, and it serves as a replacement to the fresher's party, which is generally seen in any engineering college, Kulkarni explains. It is an event that is hosted and conducted by the second-year students for the first-year students exclusively. Avishkar is designed to encourage and develop leadership qualities and team building and to enhance creativity among first-year students.

"This forum inspires students to prepare PowerPoint presentations on topics like science, technology, and the environment," Kulkarni says. "It is held on two levels: intracollege and intercollege. The participants at VBIT initially compete against their classmates at the college. In the second stage, the intercollege level, the winners of the intracollege participation compete against the members of various colleges in the state. It is the

most sought after competition among the first-year engineering students of the twin cities [of Hyderabad and Secunderabad]."

Stepping outside of VBIT's walls is nothing new to the branch's members. As part of the Indian government-sponsored National Service Scheme (NSS) program, the SB's Dyuthi group focuses on finding local solutions for global social welfare issues. This NSS unit holds several events including tree plantings, blood donation camps, and the "adoption" of local schools. The SB has volunteered with this unit since 2007 with the goal of enhancing the lives of others at a community level.

"Each event has its own unique place and importance," says Gnanendra Vemula, Global Integrated Network of IEEE representative for the VBIT SB. "Each event holds an abstract level of technicalities and circumstantialities providing a level of proficiency to each participant. As the implication of the event goes higher, higher proficiency is gained by a student member. This needs to be appreciated and recognized, and that is something that IEEE VBIT SB strongly entrusts. Hence, an unparalleled level of certification and recompense is provided for every participant student member."

Active SB members and their participation in various events enables them to interact with professionals and student members of other SBs, which in turn helps them form their own personal and professional networks. The student members not only get to meet

student members from other SBs but also technical experts and upper-level industry professionals who can be of great help to the student. Networking provides benefits that are specific to every student and, Vemula adds, the VBIT SB acknowledges it as an indispensable experience. As a result, all student members are given ample opportunity to build their network through eminent technical expertise and guidance on building soft skills.



The branch places an emphasis on conducting activities that enhance the technical cognition of students while fostering essential leadership skills.

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Sails pitch: The VBIT Windmill Project

Development becomes meaningless if it cannot be sustained for the future. This thought led to the development of sustainable energy resources. Wind energy is one of the admirable sources among the various renewable energy resources.

The law of conservation of energy had been the most basic principle applied in any machine that we use. Based on the same principle, a student group of 20 members under the guidance of Mr. K.B.V. Rao took up the challenge of fabricating a pollution-free energy-generating arrangement known as the Windmill at Vignana Bharathi Institute of Technology. The plan was to involve students from different domains in each part of the project with the end-result producing a successful windmill capable of generating power on its own.

The students were successful, leading the production of a windmill with a capacity of 500 W-output converted and stored in batteries for further use. The fabrication procedure included: 1) electrical engineering students responsible for fabricating the generator and charging units, 2) mechanical engineering students responsible for preparing the base stand and the balance of the blades and the shaft coupling to the structure and its erection, and 3) electronics engineering students responsible for designing a speed control circuit that protects the unit from the high currents and wind speeds.

The students involved in the project were K.C.B. Bala Subramanyam, M. Anwesh Kumar, R.V.D.S.N. Aditya, B. Sai Surya, L. Saketh, B. Lokesh, M. Madhuri, K. Malathi, J. Manikumar, Murali Krishna, A. Naganitish, Y. Narayana, Prudhviraj, G. Ragni, A. Rahul, Uday, R.Maheshbabu, M. Uday Kumar, Krishna Chaitanya, and Abhinav Karthik. The project took approximately three months of time for testing and the erection process, and it was inaugurated by Mr.

K. Satyanarayana Murthy, senior deputy general manager of B.H.E.L, Dr. Goutham Rao, chairman of the college, Dr. Jayanth Kulkarni, principal, and Rushi Joshi, head of the Mechanical Department, and the faculty members of the mechanical branch.

The same students took up a challenge to modify the windmill to acquire higher efficiency in terms of power output, blade aerodynamics, control circuits, and mechanical strengthening to higher levels of perfection and to make the windmill stand as a tower of excellence and a symbol of a renewable energy utilization scheme adopted by engineering students at Hyderabad.

Technical specifications

Mechanical specifications

- 25 ft total, constructed with iron and steel material.
- 4-ft 5-in blades/flaps in dimension and four in number, placed at exact equal angles of separation (90°).
- All joints and structure is based on a triangular pyramid concept for maximum balance and mechanical strength.
- A smooth axel is placed at bottom of the generator and the wind blade set to allow for 360° movement of the system when the direction of wind changes.

Civil specifications

- Wind speed: 0-14 km/h in and around the college.
- Minimum wind speed required for operating the windmill and generating the output is 4 km/h.
- The windmill is placed dimensionally on west facing as wind variations are less due to factors like obstruction due to other constructions.
- Data being regulated and verified from R&D VBIT.



Members of the VBIT Windmill Project team.

Electrical specifications

- The entire generator and shaft coupling along with the charging and converter unit is designed as per the pre-planned specifications during planning.
- Construction specifications: 12 V ac, 0.5 A per rotation test, 0.8 Ω resistance, 500 W.
- Single-phase rectifier circuit using thyristors for charging the dc batteries with a reverse flow preventive connection. (We used diode for prevent reverse flow.)
- Generator specifications are a completely one-phase winding.
- Stator sheets are made out of iron sheets cut by a pressing machine from sample dimensions.
- Twenty-four-pole rotor innovatively prepared from electrically magnetised elements surrounded by two alternate cups of iron strategically cut into teeth representing the north and south poles alternatively.
- Copper wire used for winding is 20-gauge wire wound in wave winding technique.
- Class B insulation liquid and sheets are used for the finished stator to prevent moisture depositing in windings after heat blow and also fiber plastic threads and bamboo slits to bind the windings together and keep them intact in slots.



The team with inaugural dignitaries.

- 15-mil maylar sheath for lamination in slots b/w winding and stator core/

Test results

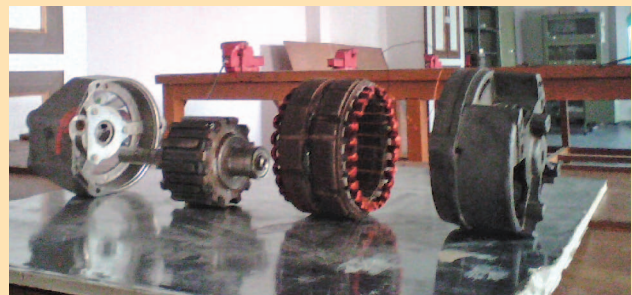
- 13 V output and 500 W is being observed at output terminals.

Electronic specifications

- Speed regulator and output power adjustment with current as variable factor.



The stator being wound in a wave fashion with only one-phase winding.



Sectional view of the generator part of the Windmill.



The coupling of main stator bars to the generator shaft and tail braces.

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increases when you're already working for that company. As engineers, we often don't want to deal with confrontation so we accept a job offer as it's presented and that might be less than we're comfortable being paid. It's common to believe that once we show our new employer what we're capable of delivering, we'll be compensated what we feel we deserve but that's not often the case. If you're not happy with the wage or benefits offered with the job in general, don't expect them to change drastically when you're working there. Negotiate upfront and base your negotiation on factual statistics such as average starting salaries for engineers in your industry and area.

It's common for people looking at buying a bed to consider that they spend 1/3 of their time on it; if that's true, how important is our decision of where to work? Give your first job and every job after that careful consideration because it will help determine the direction of your career, your financial well-being, and ultimately how happy you are for 1/3 or more of each work day. Every career naturally shifts over time and grows just like you will, so don't get too caught up in a five or ten year plan, although it's good to have one. In contrast to this, I agree with Jack Welch's concept of "chits," where you earn your employer's goodwill to get more interesting work, more flexibility, and more opportunity by doing your current job well and working hard. Don't expect your dream job or even a great job right after you graduate; most people have to work hard for it.

When you receive an offer, it's important to not only focus on money. There are five aspects that determine whether you're going to find true satisfaction in your career: if you feel what you're doing is important and meaningful, if you enjoy the work you do, if you learn and grow from the people with whom you work, if you are able to help people around you develop and grow, and, of course, your financial

security or salary and benefits. Each person will weight these areas differently, and the weights will likely change over time. However, these are the five things that I strongly urge you to consider when you're deciding whether to accept a job offer.

Another important topic that you will hopefully never have to deal with is being fired. This is something that sometimes happens to people early in their careers. This could be the result of not having the technical capabilities that a company was looking for, you may not be a good fit personality-wise, or the business factors required a change within the company. Look at this as a good thing, not a bad thing, because depending on the reason you were let go, you'll find another job that is a better fit, that you'll be happier at, or that will provide you a more promising career path. I know people who have been let go and found all of these things at their next job. Ultimately, you can't control whether or not you get fired, your employer makes that decision not you, and as my current boss likes to say, true job security isn't your ability to keep your current job, it's your ability to get your next job.

I leave you with one final piece of advice: Be eager to learn and be enthusiastic about your work. Not only will people enjoy working with you, you'll be better at your new career because you'll enjoy it.

About the author

Dan Coode (dan.coode@ieee.org) completed a bachelor's degree in electrical engineering and computer science from the University of Saskatchewan in 2003. After working as a design engineer and software developer, he moved into business management, where he currently works at SED Systems. He is an IEEE Senior Member and an active IEEE volunteer.

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VBIT promotes and supports female innovators both in the SB as well as in its IEEE Women in Engineering Affinity Group.

"Innovation and intricate skills were always a vital criterion for conducting any activity in the SB," explains Chaitanya Kumar Setti, former vice chair of the branch. "This has resulted in conducting many creative and enlightening events that were recognized by our IEEE Section and Region as remarkable achievements. By motivating new talent in this way, the IEEE

VBIT SB has set itself a unique record of its own. This has helped the SB stand out in every possible way from all the other SBs in the Section."

—Craig Causer is the managing editor of *IEEE Potentials*.