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OLAB: OF SAND, SILICON AND OYSTERS

OLAB is one of the first campus-based VLSI design facility in India. We find out how it has come to be, and what it will become...

IT was 2002 – and the 1977 batch alumni were gearing up for their silver reunion. Amidst all the hectic planning and excitement, a few members thought it would be a nice idea to give back something to the college they owed so much to. Ideas floated around, and the one that stuck was that of a world-class VLSI Laboratory. A year later, in July 2003, at the music night in Bangalore - BITSConnexion, in the melee of songs and handshakes, this idea took shape and form. Few more months later, with the efforts of some well-placed alumni in the VLSI industry in Bangalore, a presentation was given to current Vice Chancellor of BITS, Dr S. Venkateshwaran. OLAB was to be a world-class laboratory in terms of infrastructure, facilities and talent.



We spoke to **Vinod Agarwal** (68' EEE), Founder & Chairman of LogicVision (publicly traded embedded test company on NASDAQ) and **Rajendra Khare** ('77 EEE, pictured above), Managing Director of BroadCom India – doyens in the VLSI field and captains of the OLAB initiative.

“OLAB stands for Oyster Lab At BITS”, says Raj. The term oyster is

meant to indicate the environment and various processes that go into culturing pearls from sand. Which, in BITS terms, refers to converting the unrefined students' capabilities into unmatched intellectual property in the silicon world - all in good ol' Piloni.

VLSI and semiconductor design is a huge engine of growth for Silicon Valley. It also has strong links to Indians, since many have founded and worked in the Valley in this field. The chief architect of Intel's Pentium chip was an Indian. However, in India, where the focus has been Software and IT, VLSI and semiconductor design has been ignored by the mainstream of engineers and entrepreneurs.

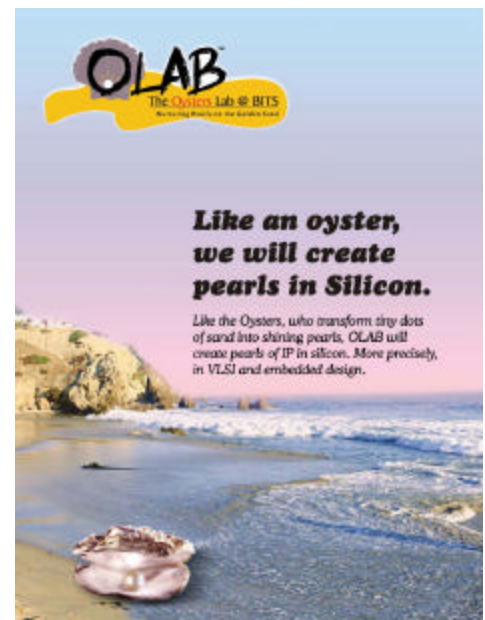
There are rational reasons for this. Firstly there are few specialized institutions in India to train people in this field. There is no fab (factory to manufacture chips) in India either. In countries like US, China, Malaysia and Taiwan, there are many fabs, which has created investment in training, research and more startups.

However, fables design is perfect for India, since it requires only investments in human capital and can easily follow the outsourcing model. India also has many successful VLSI/chip-design entrepreneurs and experts in the Valley. There is a deep pool of talent with ideas looking to do something with India. Vinod Khosla, India's best known VC has moved to India and is generating interest with investments in the field.

As VLSI becomes a mainstream field in India, there will be a tremendous need for world-class training facilities, which is what prompted Vinod and Raj to set

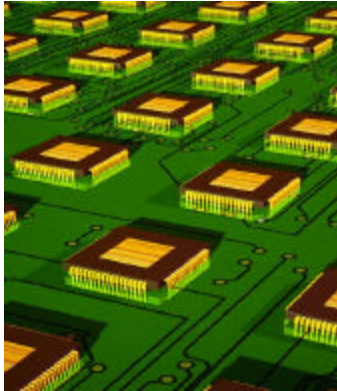
up a lab with world-class infrastructure. Partnering with BITS made sense with its faculty, alums, talent, resources, linkages to industry and most importantly, experience in training. Raj believes that with its world class infrastructure and with the proper guidance, students should be able to conduct cutting edge research, which would focus on real world problems and produce competitive, commercially viable solutions. Eventually trained professionals would go off to work for MNCs in India, domestic start-ups or create their own companies, putting India on the world silicon map.

Thanks to the excellent personal efforts of Raj and Vinod, BITS has received \$50 million worth of expensive tools from Mentor Graphics & Magma Design Automation and other high-priced workstations and servers from Sun Microsystems. The tools now in BITS are really up to the mark and comparable to any professional set up in the silicon industry. Now the Neuron Network also empowers you to connect to a centralized



facility which, along with OLAB, would be a very powerful combination.

Tons of alums have pitched in to help from Bangalore and Delhi. They are helping to fulfill the



requirement of design experts from the real world who can help BITS students get the full benefits of OLAB's world class infrastructure.

The key players, VLSI engineers with a rich experience of 5-6 yrs in the field include **Nagesh Chatekar** from BroadCom, **Deepa J** from Cypress, **Sriram R** from TI, **Karthik Kandaswamy** from Wipro, **Anurup Mitra** and **Kallol Chatterjee** from ST. **Dr. Anand Bariya** from Toshiba is also playing a major role in helping with cell libraries and other design needs. The building blocks required for the projects have been given by these key players, as we call them, and they have been very instrumental in creating and formulating the actual projects that the students have to work on. Presently there are also about 5 project assistants, ME students at BITS, who will help give the continuity that is required to carry forward the work for a significantly long time. There are even plans that the OLAB infrastructure may be used for PhD programs in BITS. The VLSI engineers and key players involved have also traveled to BITS, surveyed the lab and are now even having weekly conference calls.

The current projects are now small pieces of the big puzzle which is the ZigBee technology. ZigBee is considered as the next revolution in wireless technology by industry leaders. This technology is very new and has a lot of scope- dealing with wireless interaction between networks. In short, an implementation of what we have been projecting as non-working models in APOGEE for years now. The next major milestone for OLAB would be an integration of all the projects to give a successful solution to the ZigBee, which might even be commercially successful. BITS could collaborate with foreign universities like the **University of Berkley** who are currently working on ZigBee.



All this has not been easy. One of the main problems they faced in Pilani is that it has taken a while to get the relatively laid back students (like we were) used to the grilling timetables, schedules and demands of the Industry. But things have improved, says Raj, for once OLAB went live, people have begun to show enthusiasm and support for working demanding hours. One other problem is that faculty themselves are not as exposed to this field, in Pilani or even India since there are so few people exposed to field. **Prof Gurunaranan**, who heads this initiative and **Dr. L.K Maheshwari** have been extremely helpful on this initiative. They have extended their full support and cooperation to alums **Kallol Chatterjee** and **Anuroop Mitra** who have traveled

many times to Pilani to guide and help the students.

Vinod, who along with Raj will guide and nurture OLAB closely, says "There is a necessity of people, design experts and others with experience in the semiconductor industry". He adds that "People should visit BITS, get involved and to help in knowledge transfer. World-class tools will not be of much help without world class teachers"

Grand plans are underway. An extension center is being set up in Bangalore that will become India's leading training and research center for VLSI training for professionals in industry, with close linkages for commercialization of research. It will also be open to non-BITSians and utilized as a PS II center as well. Raj This emphasis on VLSI integrates well with the recent grant by the DoE to BITS for Rs. 2 crores to set up a Technology Business Incubator that will be a center of excellence in creating VLSI and embedded software start-ups.

When India becomes a superpower in the field of semiconductors, BITS, OLAB, Vinod, Raj and all those who are involved would have played an important role in creating that history.

For alumni who have crossed borders and shores to teach, study and work in the silicon industry, this might be a good chance to get involved with their alma matter in something of interest, and give back a little of what they got to BITS and to India. If you are interested, sign up at the yahoogroup which has over 80 alums. Search on www.yahoogroups.com for **bitsaa-olab** to volunteer for this initiative.

