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Widening horizons in BioInformatics

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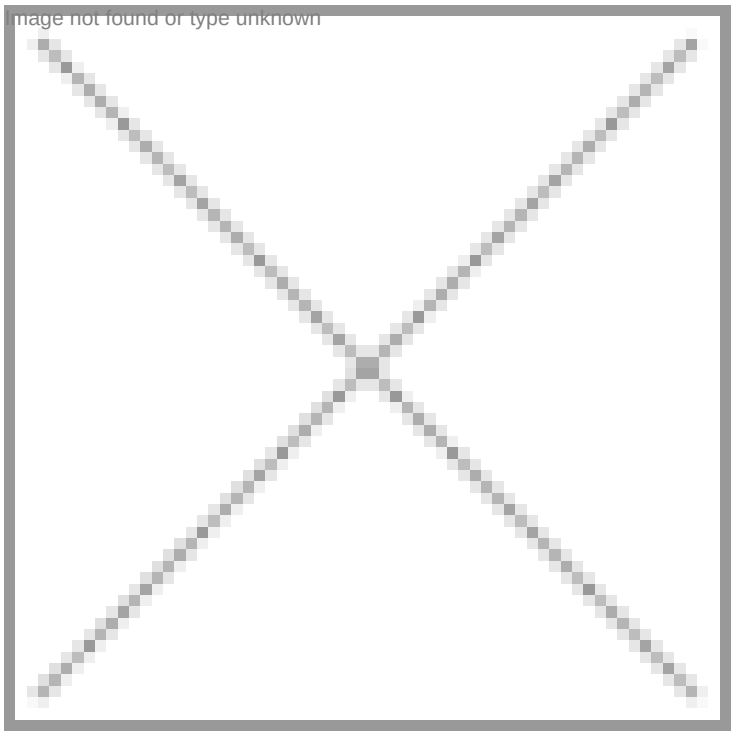
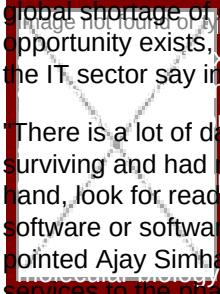


Widening horizons in BioInformatics

With genomics research making strides, the volume of life sciences related data is increasing at a very fast pace. Organizing, analyzing and further utilizing this knowledge, collectively called as bioinformatics, is still a nascent and largely unexplored field in India.

With the global bioinformatics segment expected to grow to $6 billion by 2005 according to several studies, opportunities abound in this sector. The fact that in the next 10 years most new drug designs will be genomics-related and there being a global shortage of one million professionals in this field, this unique niche area is waiting to be explored. Though the opportunity exists, it should not be construed that bioinformatics is the next big thing. It is not and cannot be compared with the IT sector say industry observers.



"There is a lot of data to be managed and mined. However, biotech companies over the last two years have been busy surviving and had not looked at solution providers for informatics solutions in a big way. Pharma companies, on the other hand, look for ready products to be bought and are generally averse to outsource custom projects. Availability of free software or software bundled with analytical equipment is another challenge facing the pure play bioinformatics companies," pointed Ajay Simha, director, SysArris Software Pvt Ltd, a Bangalore based company offering IT software solutions and services to the pharma and biotech segment since the past eight years.

Vibhav Garg, functional consultant, Mascon Life Sciences, a New Delhi based company that develops bioinformatics software for pharma companies and research labs, feels that the current buzz about bioinformatics is partially justified. "There is an urgent need to understand the available data. But the hype created by unauthorized so-called training centers is absolutely unwarranted and many times creates confusion in the minds of new entrants," Garg informed.

None deny that bioinformatics, the amalgamation of biology and information technology, requires a range of "interdisciplinary skills". "The requirement here is to be able to have a good blend of computer and life science scientists working together and delivering solutions, which are the best of both domains. This is so because it combines two domains with very different principles and ways of functioning," observed S Soumyanarayan, manager, business development and alliances of Strand Genomics, Bangalore.

Bioinformatics companies generally have well-defined teams with a clear business focus. For example, in Mascon, there are three groupsâ€"a functional team, which is the driving force, consists of domain experts. The development team is the supporting arm and comprises the software professionals. Then there is a business development team. Likewise, SysArris has domain experts who are thorough in genomics, cheminformatics and other areas. These experts understand the requirements of customers and provide the best solution. The software team then converts the requirements to a software solution.

Till last year, bioinformatics accounted for about 4 percent of the total size of the biotech industry, but it is expected to catch up fast. The total sales revenue (2002-03) generated by this segment was about Rs 75 crore and a major chunk of it (64 percent) was through projects for overseas companies. Today most of the companies in this segment are small to mid size, with employees ranging from 25 to 200 plus and the average man to women ratio is 2:1.

The salary range depends on the experience and capabilities of the person and performers are recognized and well rewarded. "While the starting salaries could be anywhere from Rs 10,000 to Rs 20,000 per month depending on the experience of the candidate, it can go up very high as there is a review every six months," said Anuradha Acharya, CEO, Ocimum Biosolutions, Hyderabad. Others too feel the same. The salaries offered can start from Rs 1.8-2 lakh per annum and can reach as high as Rs 12-15 lakh per annum based on the experience and type of skills.

This nascent field provides immense growth opportunities in terms of knowledge base, market exposure and career advancement. "We have identified several growth tracks for our employees. These could be either in pure software development, bioinformatics, management or sales and marketing. A person could start as a trainee, bioinformatician or software developer and could end up becoming part of the top management," added Anuradha.

Selection process

For entry and junior level candidates, companies conduct written tests and interviews, whereas at senior levels intake is generally through referrals and a round of discussions. "We generally look for people with at least one year relevant experience; if no suitable candidates are found, we take the most suitable candidate and train on-the-job," said Ajay Simha. Some of the companies do campus recruitments. Often, companies prefer to go to the IITs and RECs.

Most companies have a very structured procedure for intake of candidates. Like Anuradha Acharya explained, "The procedure for manpower selection starts with management review meeting where the resource plan for manpower recruitment is prepared. After the resource plan is prepared, the next step is to find out the reliable resources to get the manpower. For instance registration with the jobsites, placing an advertisement in paper, approaching consultants and through employee referral program, which is called 'Introcentive'. The next step is scanning resumes for a specific requirement and short-listing them. Then the short listed candidates have to go through a screening test. After qualifying the

Meeting the industry norms

Bioinformatics is a well known institute
xcellence in research in cutting edge
natics, genomics and proteomics.
roached Dr Akhilesh Pandey, chief
Institute of Bioinformatics for his views
l sets for students

should have sound knowledge of
, a passion for life sciences and an
inquisitive mind. Apart from this, he or she should
possess:

1. Knowledge of UNIX/Linux the operating system used for many computational biology programs

2. A good grasp of the concept of relational databases, which are the heart of bioinformatics

3. Programming languages such as Perl or Python, which are popular in the field of bioinformatics. In the future, knowledge of object-oriented databases may be increasingly important

4. Expert knowledge of sequence-analysis programs like BLAST is critical.

5. Web skills are necessary, including the ability to write Hypertext Markup Language (HTML)

screening test, an applicant has to undergo a minimum of three rounds of interview. Once the applicant is through with all the above rounds, he/she would be put to the top management for final interview. Once the top management is convinced, the next step would be issuance of an offer letter."

Besides the basic qualification (a masters or higher degree in a branch of life science or computer science), prior experience or training in the industry or research organization is an added advantage concur most company heads. But the experience required would depend on the openings from time to time. As such, bioinformatics being a new field, it is very difficult to get people who have cross-functional expertise. Hence, the companies generally provide training before putting the candidate to work. Some like Ocimum Biosolutions offer a postgraduate diploma program in bioinformatics in association with University of Alabama at Huntsville. The duration of the course is six months. The students who join this program usually have expertise or a degree in either life sciences or computer science. The program nurtures them to become cross-trained. "This has worked out very well for Ocimum both in terms of recruitment and also keeping the development team up to date with the subject. All employees are also encouraged to participate in this program," elaborated Anuradha. Many bioinformatics companies have an arrangement for short-duration high-end specialized training for working professionals. They permit internship projects for students.

According to YK Maheshwari, Sr VP, health care and life sciences, Kshema Technologies, Bangalore, "Hands-on training or experience is not a necessary prerequisite, but those with such experience are obviously preferred. Selection is easier for engineers or professionals, who have developed software, who understand the development SDLC (Life cycle processes) and know the requirement gathering process or candidates with knowledge on data warehousing, business intelligence, pharma workflow, lab management systems, FDA approval process, drug discovery life cycle".

So is there a future? Maheshwari summed up: "There are multiple opportunities, in what goes under the wide banner of bioinformatics. Technical developments such as molecular genetics, proteomics and metabolomics provide the analytical base to support the advances in life sciences, but there is a demand for novel automated tools to reduce the time involved in the discovery life cycle. There is a shortage of individuals, though critical for the future, with the necessary multidisciplinary expertise for the development of genomic/analytics applications that demands a high level of knowledge/interpretation skill beyond that previously employed in the information technology sector."

But at the same time the buzz about bioinformatics is not entirely justified since it undermines the requirement of core strengths such as fundamental biology, genetics, molecular biology, statistics, computer science and mathematics and places emphasis instead on a loose mix of all these fields.

Rolly Dureha