

Shakthimaan! The Indian Challenge of FLOSS Advocacy *

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ABSTRACT

This paper discusses the challenges involved in advocating Free/Libre/Open Source Software (FLOSS) to the students, faculty of engineering institutions in India, as observed by the author. It provides an overview of the current engineering education system, its drawbacks, and the mindsets of the students, faculty, and institution management. The methods used to advocate Free/Libre/Open Source Software to improve the education standards are also addressed. The views expressed in this paper are solely those of the author based on his advocacy work since 2004.

1. INTRODUCTION

The software industry in India has been booming in recent years with the outsourcing of jobs. In comparison, the engineering institutions haven't been producing quality engineers for the work. There is a huge gap between the academia and the industry in many of the engineering institutions in India.

People are very ignorant about current trends in technology. They seldom know about what real education is, and what it should teach. It is very difficult to teach a person what he/she is ignorant about, and tell him/her that they are ignorant. It is this "ignorance of ignorance" that needs to be tackled with the help of Free/Libre/Open Source Software, and the FLOSS community.

2. ENGINEERING EDUCATION SYSTEM

The engineering education system in India hasn't changed much over the years. Students follow a six theoretical course, and two practical course curriculum, every semester. Students spend most of their college time in classrooms with theoretical lectures, and only about six hours per week in the laboratory. This is in contrary to what the industry expects from students,

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wherein, employees spend most of their time doing practical work.

Assignments and heavy homework are given to students which involve only extensive physical writing, rather than work for the mind. The homework doesn't tease the brain cells of the students, or do they make them think. This system makes the students dislike education as a whole.

New courses and updation of syllabus do not take place every semester. This is not acceptable with the rapid pace of new emerging technologies in the industry.

The concept of collaboration doesn't exist in a majority of institutions. Because of this, there isn't much inter-departmental collaboration either. There are very few exceptional engineering universities/colleges, like IITs/IISc/NITs, where there is good interaction between the industry and the academia. But, there are only limited seats in these excellent institutions compared to the large number of students who enter into engineering each year.

Infrastructure is present in many colleges, but, their use is restricted. Rather than punishing a few mischievous students for misuse of technology, complete prohibition is preventing even the few good students from learning or doing research. Very few universities/colleges have 24x7 access to computer labs, and the Internet. Use of floppies, USB disks and CDs are usually permitted.

Most of the private colleges are owned by politicians who have no research or learning experience. College managements need to invest a lot of time and money in education. A majority of them just carry on the tradition of what has been continuing over the years, and seldom want to change or know what to change. There are very few exceptional managements, but in such places students/faculty are not motivated enough to make the best use of the available resources. College managements have to be made aware of the industry, and academic research trends, and they need to work together with faculty and students. Free/Libre/Open Source Software can help in bridging this gap.

3. STUDENTS

The students in a majority of the institutions are not aware of the existing gap between academia and the industry, and don't take any initiative or drive to learn by themselves. The general attitude is that this is the age of the youth, and

that they need to only enjoy life. They fail to realize that at this age they can learn a lot. Once they hit an old age, they wouldn't be able to learn as much as what they can do now. Perhaps, out of 60 students in a class, only 5 may be keen on learning. Most of them waste their time with gossip, culturals, and movies.

Students living in cities spend most of their time in the weekends hanging out with friends, playing games, and watching movies. Students living in towns and rural villages prefer to go to their home place (usually few kilometres away), and they too meet their friends, and hang around with them. So, there is absolutely no difference between students living in urban and rural places in India. It is not wrong in gossiping, watching movies, or playing games, provided they also spend valuable time and effort in academic activities.

Most of them fall into the trap of excess time wasting due to peer pressure. Their life is influenced greatly by television, and the Internet. They spend lot of time with instant messaging through mobile phones, and online chat. There isn't much work done using the Internet for engineering due to the lack of know-how and collaboration.

Students living in the city have reasonable good English fluency. Students in towns and rural villages are fluent in their local language, and prefer to speak in the same. It is very easy for students to learn something new in their mother tongue. Those who discuss technical concepts, do discuss with a mixture of their local language and English. But, English is used primarily for all official communication, written and oral.

There are four types of students. The first type are those who are very shy, and always hesitate to ask questions. They feel that their classmates will tease them if they asked questions. The second type of students are those who usually ask questions but in private, after a lecture or workshop. The third type of students are those who are shy to talk to speakers in a workshop, but, will correspond with you through e-mail/phone. The fourth type of students are those who are very bold, and they will shoot their questions, anytime, anywhere. Most students are shy, and have had no exposure to group activities or collaboration, and hence 96% of them fall under the first type.

There is also the lack of knowledge-sharing amongst students. They feel that having more knowledge, and not sharing it is an advantage for them over others. So, they usually don't like to help their class mates (unless he/she is their good friend) thinking that they will be their competitors. But, in the FLOSS world, the more you share knowledge, the more you learn, and it motivates you to learn even more.

Irrespective of whether the engineering curriculum can be changed, or if the faculty are not qualified to teach, students can themselves learn a lot from FLOSS with the help of the online community easily through mailing lists, forums, IRC et. al. This know-how needs to be taught to them.

4. FACULTY

The faculty in an engineering college keep changing, often. Faculty members are not highly paid, and hence most of

them prefer to get a job in the industry with a good salary. Because of the rapid growth in the number of colleges and the shortage of faculty, graduating students are offered teaching jobs in the same college/university where they studied. Since, as students they didn't learn much, they cannot impart much to their juniors. This vicious cycle has been continuing for many years.

The use of English as a means of communication for non-English speaking faculty makes it hard for them and the students. Most of them usually speak in a monotonous tone, without any voice modulation, and don't make talks interactive with the students. Even if they had FLOSS in the syllabus, and the faculty is not good in teaching it to students, students are still going to be disinterested. Communicating in the local language gives them the confidence to explain concepts, the satisfaction of teaching, and being able to convey their thoughts fluently to students.

Education ought to teach people to think or reason. Students and faculty always expect someone to come, and teach them. This has been the general trend for many ages. Because of this attitude, when they are introduced to something new, they expect you to come and help them in case of any problem or troubleshooting. This is not the case in the industry, or in *education* where you, as an individual, is expected to think on your own, and try to solve the problem yourselves. It is this self-learning, problem-solving ability that makes one a good thinker. This is something that education doesn't teach the students.

There is a difference between helping and spoon-feeding, and one should know the difference. If the individual has done his/her homework, then one can help. But, doing things entirely with help is not going to help him/her learn, or learn to troubleshoot. If one tried to solve a problem, and just got help when required, in future, the tendency would be to try to first solve it by themselves. On the other hand, if you go for help all the time, one will never learn.

There is also lot of inter-department politics among faculty, that they forget to learn something new themselves, or help students. Out of the entire faculty in a department, only few professors are keen on learning something new, irrespective of what their salary is or what other faculty have to say about them. The rest, a majority, seldom want to do anything, but, just do what they are told to do. This is primarily due to low salary, ego issues, and inter-departmental politics. Because the bureaucratic system hasn't given them due credit for their work, and they haven't done any collaboration, they are not aware that in the FLOSS community, true credit, appreciation is given to the individual for his/her work.

Students use the lack of knowledgeable faculty as an excuse for not attempting to learn anything.

5. THE CHALLENGE

Edmund Burke said, "All that is necessary for the triumph of evil is for good men to do nothing". As educated FLOSS citizens, it is essential for us to help our fellow citizens. This attitude will help us transform a nation, and make it a better society.

5.1 Ignorance

The engineering education system needs a drastic change. The attitude of the people need to change. When people are given credit, appreciation for their work, the pride will motivate them to do even greater things. This happens very much with FLOSS projects.

People are very ignorant, and they don't know that they are ignorant. In a bureaucratic system, people are kept ignorant. When you question their ignorance, they will definitely question you. Because, the system has been carrying on this way over the years, and because they haven't seen real education in universities in other countries, you will be subjected to criticism. People haven't changed, and so the question often asked is, "Why do you bother?". It is their ignorance of their ignorance, and acceptance of the current incompetent system that doesn't help them change. It is very important to be patient in explaining to them what they have not learnt. Therefore, one should teach them as to how they should learn and reason. FLOSS gives them hands-on-experience, and this can greatly help in the cause.

A majority of the company bosses in India are people of an older generation. During their time there was no FLOSS. In a bureaucratic setup, it is these people who make the final decisions. Hence, they need to be educated and made aware of the same, just like students, faculty, and institution managements.

5.2 Education

The ideal solution will be for universities/colleges to be autonomous. This will give them all the freedom that they can get, and if properly utilized will help them grow, and churn productive engineers for the country.

Practical coursework should be emphasized, exceptions are theoretical courses. In a percentage-based system the performance of a student is determined by a 3-hour final written examination. All colleges/universities following this percentage system should change to the credit-based system, wherein credit is given to each and every work done - theoretical, practical, and extra-curricular.

One of the reasons for IITs/IISc/NITs to be excellent are the faculty. Most of them are PhDs, have served in universities abroad, and are current in whatever they are doing. They have the international exposure, and contacts to keep themselves uptodate. When a person collaborates online with FLOSS projects, they get to work with people abroad without having to travel abroad, get to know the problem-solving mindsets of people from different backgrounds, and also keep themselves uptodate with the current trends. The freedom to share code, and learn greatly helps too.

Workshops for students/faculty must teach them on how to work with the FLOSS community - participation in mailing lists, bottom posting, IRC, asking smart questions etc. - as they are very new to FLOSS collaboration.

With more departments using FLOSS, inter-department collaboration will help in knowledge growth. This collaboration will then grow to inter-collegiate, inter-universities, and then collaboration between international universities.

Advocacy in schools has been very difficult. Kerala is an exception. Schools seldom have any website or contact e-mail address. Hence, they require you to come personally during weekdays after fixing an appointment to discuss with them for possible FLOSS workshops. When you are working full-time, it becomes difficult to leave work during office hours to meet them.

Atleast in colleges, communication with students/faculty is possible with e-mail.

The solution to advocating FLOSS in schools is to form a list of user group members, and schools where they studied, and ask them to organize or start the initiation for workshops for school students. It will be easier to get an entry into the schools through this method.

5.3 Advocacy

There are two different ways to advocate FLOSS. In the first method, you invite the public to a location, say a city, for a conference/workshop. This methodology is not effective in a developing country like India. Most of these conferences are held in major metropolitan cities. There is already too much congestion, and traffic in cities in India. People in rural areas cannot afford to come to the city for such a workshop/conference.

The second method is to take FLOSS to different places. This is the author's preferred method. As an individual working in a city, one can afford to go to distant places to spread FLOSS. Most companies don't work on weekends. So, doing a workshop during weekends at colleges/schools would be ideal for all. Of course, colleges do compel students to attend classes on Saturdays. So, it helps in your cause.

In a developing country, one has to hit the roads, and try to reach out to each and every individual for FLOSS to spread. There is no substitute for hard work.

As a consultant it is possible to earn money with FLOSS, and also help in contribution and advocacy. But, in a developing nation such as India, one may not be able to reach out to every nook and corner when one demands money for workshops. The moment one asks for money, some college managements will think twice. Since your objective is to reach to all within the campus, money shouldn't be a barrier between you and your objectives, and hence it is essential to do workshops for free. You can ask colleges to reimburse travel costs, and take care of accomodation.

Localization is very important to reach out to the masses. Good work has been done by Indian localization teams and provide local language support in various Free/Libre/Open Source Software packages and menu interfaces. The IndLinux project is a good example. It is important to converse in the local language of the audience to reach out to them easily, and convey the message across. India, being a diverse nation, cities located near state borders have people from different cultures, and English is the preferred language.

The people's minds are influenced by the media (newspapers, television, radio). The media folks need to be made aware of Free/Libre/Open Source Software. In a bureaucratic environment

good contacts are essential for advertising in the media. It is quite expensive for an individual or a non-profit organization to advertise in television/radio. Since, as individuals or non-profit organizations, one cannot afford it, one has to hit the roads to promote FLOSS.

The advocacy work is greatly helped by having a website that provides details, photos of the work done. It gives credibility to other colleges/universities who are interested in inviting the speaker for workshops. Ability to network among the student community is very important, through e-mails, mailing lists, IRC, phone, social network services et. al. When students are contacted, they discuss with the faculty, and get permission for the workshop from the college management. Or, if you know the faculty, they can help organizing the workshop. Planning for a workshop in the outskirts of a city may take two-three weeks. Planning for a workshop outside the city takes atleast a month.

At the end of a FLOSS workshop, students are quite amazed with what they can do with FLOSS. They feel elated and happy that they can finally do something practical with their theoretical knowledge. They do face a learning curve, but, they enjoy it as it is practical, and challenging for them.

5.4 Community

Internet connectivity is very poor in remote places, and with only dial-up, downloads could be pathetic. The "CDs for Grabs" project was opened in the Chennai GNU/Linux User's Group (http://www.chennaiug.org/wiki/?title=CDs_for_Grab) wiki, which provides e-mail, phone details and available CDs of group members. It costs few tens of rupees to courier CDs to different places in India. Usually, blank CDs are exchanged for burnt copies of GNU/Linux distributions. In this way, FLOSS in CDs can be made available to every person and place.

There are plenty of GNU/Linux User Groups and Free Software User Groups in India, and a majority of them are non-profit organizations that are run by volunteers from the academia, industry, Government, colleges/schools, non-profit organizations etc. They are doing their best in promoting FLOSS, but, the percentage of people who contribute physically is very less, and is very similar in proportion to the five college students out of 60. The attitude from the college days continues when they come to the real world - when working in the industry. It would be beneficial if there is more physical participation from industry and the community.

Education and awareness will also change and solve the other problems faced by society in a developing country.

6. CONCLUSION

The education system definitely needs a change in India, and FLOSS needs to be incorporated into the curriculum in a large-scale. It is very important for people to be made aware of their ignorance. If we need to change society, it has to change in the grass root levels - the education system. A change in one generation will drastically change the future generations.

Volunteers from GNU/Linux User Groups and Free Software User Groups have to take turns in FLOSS advocacy, and

attempt to address as many institutions/groups as possible. Each individual can take a particular topic of interest, study it, prepare a presentation/demo and visit colleges and present it. This way the work-load is shared amongst volunteers. A different topic can be chosen for the subsequent semester.

Advocacy will lead to spawning of more user groups, and periodic talks will keep the FLOSS enthusiasts interested and motivated.

The issues discussed, and the problems faced might also be applicable to other developing nations. The advocacy method could be effective in other developing countries as well.

FLOSS advocacy is the key to imparting education, enhancing the standard of education for a better society.

In the true words of Dr. A. P. J. Abdul Kalam, "The most unfortunate thing is that India still seems to believe in proprietary solutions. Further spread of IT which is influencing the daily life of individuals would have a devastating effect on the lives of society due to any small shift in the business practice involving these proprietary solutions. It is precisely for these reasons open source software need to be built which would be cost effective for the entire society."

"In India, open source code software will have to come and stay in a big way for the benefit of our billion people."

7. REFERENCES

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