

Communication

ETHICS FOR EDUCATIONAL INSTITUTIONS IN THE CYBER ERA

ISSUES AND PROPOSED SOLUTION

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***I**f an ordinary boy can get enlightened on hearing the story of the “noble king Harishchandra” and become a Mahatma, why not our current students? Education forms the backbone for any country that claims itself to be cultured and “Ethics” added during this phase will make it sustain. In this paper, we would argue the issues involved in this cyber era with respect to the educational institutions and propose some possible solutions. Working in an exclusive Research and Development Educational Organisation, National Centre for Software Technology, we have documented our own experiences. The scope of our argument is limited to the Ethics pertaining to the Educational Institutions in the area of Information Technology. We believe that it is high time to table down this issue, specially in current day scenario of growing dependency over Computers and try to propose measures. Aiming at the educational institutions to argue that this will be fruitful since today’s student is the tomorrow’s leader. We present here a case study based on our experience with respect to computer technology usage by the staff and student community from point of view of ethics. Finally we propose a solution to address the issues at different levels and by various possible means.*

Introduction

“A man’s ethical behaviour should be based effectively on sympathy, education and social ties; no religious basis is necessary. Man would indeed be in poor way if he had to be restrained by fear of punishment and hope of reward after death”.

by Albert Einstein

Today the world is moving towards total automation whether at home or outside. Technological innovations in the development of computing facilities, house hold appliances and various technical resources are the latest development these days. The explosion of the Internet has made human interaction and communication move in a new direction. The provisions of registering a unique domain for oneself can be compared with land registration. Rival attacks and the age old jealousy of yesteryears still exists but with new threats. Governments around the world have started realizing this.

Innovations in the field of medicine have reached the level of cloning which also opened the arguments about the impact. Innovations in the field of nuclear sources have matured to a drastic level, but speculations still persist.

Ethical behaviour, as rightly said, details the personal ethics, responsibilities being developed when a human being grows up. Morals and ethics of a human have always been in question. Infact there have been several debates as to What is wrong? and What is right? There seem to be no end to the same.

Ethics in Hi-Tech World

Today’s technological world, the “Cyber Age” as we call it, is a mixed up world of family, relations, traditions, learning, inventing, racing, catching, buying, selling, all rolled into one. This highly churned up environment, the highly paced up technology plays a major role. But these day-to-day, technological advances leave behind a void

when the model named “Human” comes into picture. Humans the biological species, who are still not programmed to behave are the ones that would be the puppets of technology. It is not surprising that there are many points at which people are *forced* to adopt the technical pool lying around them.

With this growing usage, at any time, the question of moral values, responsibility pops up. Though the responsibility may be binding by law, wherein, the behaviour is written out in the term of Act and Postulates, an attribute, an approach cannot be pinned down. It is here that the issues concerning behaviour, decision and regulation with different technologies come into picture.

We say research is going on. This research requires input. An example of an input required for Medical research, wherein some genes and DNA have to be studied. It becomes an issue as to what length a scientist can study the anomaly, the cell structure. There are experiments conducted and clinical trials done to understand the human. As an example, there are experiments being conducted to figure out the hormones in human body, their normal and abnormal patterns, its affects on various biological patterns, open conduction of these experiments becomes a primary concern. Demands are being put to make accountability and as a result a cell/board for maintenance and improvement of ethical standards in human research was being set-up.

Not only in the medicine world, military and other forces have developed ethical fighting squad rules that cater to all technological advancements. This is nothing new, it was prevalent from beginning of the civilization. War ethics, as we call date back from the times of Napoleon and Kremlin to the present world societies like UN Charter and Red Cross that stand testimonial to the code of ethics and understanding.

By now it is obvious, the new revolution like the cable TVs, telecom networks, and data networks are vulnerable. In the areas of telecommunications, when inter and intra connection seems possible, there are several issues that rock the table.

Open Service Cable

There are local telecommunication companies and service providers providing open service of the Internet set up on these telephone lines, with the option of voice and data. With the finance issue coming in, long distance companies are paying billions to local companies to subsidize the service. There is a great controversy over how much the charges to be subsidized and how to make that explicitly clear. Also there needs to be settlement of interconnection requirements within local telecommunication companies to unbundle their network. The Internet calls must meet interstate rules, which need to be well defined. Customer are complaining of different charges at different places being charged by different vendors is of critical importance.

Aerospace

Today even the nature has not been left untouched by the developments aerospace world in full swing. The space technology and research areas however portray a different picture from different angles. There is a continuous depletion of ozone gas, which is the natural protective covers for mankind. There are unparalleled advances made in these areas in some developed countries. But what if the technology is demanded from other small, developing, underdeveloped countries. Heavy price tag is being put to boast of a techno rich nation. With the result, many requirements are remaining unfulfilled. Supercomputer and other products being so expensive lead one into thinking whether research and technological advancement is only for strong and economically concentrated sectors.

Pollution

Global pollution is affecting mankind. Be it sources of noise, or pollution of air, and water. The noise of working energy, industries etc are adding to noise pollution, with global climate changing and mankind being affected. But who bothers? It's all unethical when ethics in question.

Network Attacks

In 1998, National Institute of Standards and Technology(NIST) categorized and analysed 237 computer attacks that were published on the Internet out of an estimated 400 published attacks. This sample yielded the following statistics:

29% of attacks can be launched from Windows hosts.

One does not need to understand Unix to be dangerous anymore. We are in an era of “point and click” attacks.

20% of attacks are able to remotely penetrate network elements (e.g., routers, switches, hosts, printers, and firewalls).

Attacks that give remote users access to hosts are not rare.

3% of the attacks enable Web sites to attack those who visited the site.

IT Laws

With the growth of IT and its application in every field there arrived a need for formulating IT specific laws and legal bindings. These laws relate to copyright protection, data protection, rights of cyber citizens, analysts of cyber crimes and regulations for the business aspects of IT. As the IT laws were announced, there was a coupling effect in the business, banks, crimes, and thefts. Making adaptation in the listing law structure, in order to bring in the IT culture and thinking to the legal world. Many unthought of issues creep up, that still relate to many cases being lodged and argued upon.

In some of the cases the issues related to the copying of data. Copyright protection deal with this, but it does not relate a computer program expressed in object code and for an operating system program to being a proper subject matter for copyright protection, or whenever the copyright protection is extended beyond the actual code of the program to protect the programs structure.

In other cases, the purchase of software from any firm or software agency does not specify whether the software would in any kind have any malicious effect on the firm buying the product. It does not seem important enough from the side of the party developing software, to think in terms of all the effects their product can have on the customer side. To how much extent the developers' world think or strive to catch to the possible drastic effects of their product. Then interests are primary in the commercial aspects of the dealing and at max maintenance agreement may be signed. On the other hand, the customer may not be in a position to think or know about the software program running or deployed on their systems. It is their virtual blind faith on the deal made that drives the matter. And sometimes when the situation leads to disaster, the parties turn to the legal help.

It all comes down to the normal responsibilities and the ethics of the developing concern. It is the efforts and the extent to which they go to provide effective service that is taken into consideration from the customer's point of view.

While this was all in the business aspects, we cannot ignore the situation of the community referred to as the Netizens. As the netizen population shoots up, principles of using the technical world effectively get highlighted.

Usage of data on the internet again brings up the discussion of copyright. Since the data is easily available, it may or may not be the property of the authorities putting up the data. Copyright of the data, may just sound as some other typed lines that need not be considered to the extent of deleting from the data to the legal language of copyright protection. Again it is the authority publicizing their data openly that are in picture. The quality and quantity of data that they openly put up on the net and its effect on the net community should be considered.

When it comes to the cyber crimes, there is no end. But the beginning may sound even more worried. As they say “Ignorance is not a defence”. But, how much pains are being taken, how much effort is being made in order to spread awareness about cyber laws? To how much extent the law Governing Council is stepping up to spread awareness among the netizens, the cyber related legal acts and clauses.

On the other hand, we cannot say to how much extent, a netizen is trying to know?

It may sound even more unnerving when we come to know that the IT laws and framework are different spanning across Cyberspace as a place entry is here not bound by geographical boundaries. But when it comes down to framing of IT, specific laws, terrestrial and lingual boundaries play an important role. Thus the whole framework

and architecture of the law council may be depicted as restriction to a specific environment, which may lead to several other loop holes other matters being accused.

Morals, responsibilities, ethics and words that often come into over mind when we start thinking globally.

Case Study: Educational Institutions with IT Background

NCST is an R&D and Educational Organization under the Ministry of Information Technology Government of India. We research in various areas of computer science such as Computer Networks, DBMS, Graphics, Knowledge Based Systems, Graphics and Educational Technology. We run one year PG diploma courses in Software Technology and Internet Technology, and Diploma in Software Technology. We have offices in India at Mumbai and Bangalore. With this background and the student staff interactions we share our experiences with regards to ethics. There are 4 communities that interact in an education use: (a) Teaching Staff, (b) Administration Staff, (c) System Implementers and Maintenance Engineers, (d) Students.

Organisational Structure

(a) Current Structure

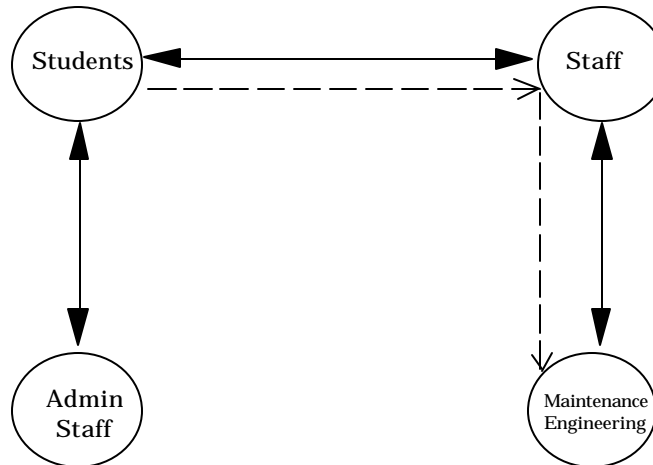


Figure 1: Current Organizational Setup

— — — — > indicates rare relations.

The current interaction between these communities and the organization is as follows:

The organization structure is as shown in Figure 1. The students and staff interact directly. It is the staff which has to impart, conduct lessons, tutorial while it is the student who has to imbibe knowledge. While the interaction has to be normally commutative i.e. both ways, it is not so in general. The staff and the students are secluded in their own world, in their own environment and vest their interest in their own commitments.

Imparting knowledge in only one direction without getting effective feedbacks, lack of open discussions and getting to know the problems is an injustice to the society.

It is the students who are the potential leaders, technologists, bureaucrats of the modern world. It is the students who are going to be teachers, and join the staff community, and are going to lead the next generation.

Coming to the other interaction between the student and the administration, concerns the technical and non technical issues that serve as a backbone to education imparting requirements like computer systems, software, accessing of printers, storage media is not only necessary but must when it comes to an IT learning institution. While for others, it is workshop, tools, machines, test bed, simulation systems, components and other assisting systems, that should work properly and be assisted by the administrator.

For all this to function, students require imminent help from the Administrative department which is technically oriented. Apart from these requirements of necessary infrastructure like study equipments, stationery, educational set-up and its daily requirements, financial assistance, official formalities, paper work etc are the parallel requirements for the machinery to be working hassle free.

But again there are two faces of the same. Are the resources, facilities for particular students only? Is it for them to use as and when and however they like?

Mutual relations between the Administrative staff and maintenance Engineers is also important. But there exists a thin line of difference between these working groups. There have been cases that relate to egoistic behaviour of either sides, that has led to dismantling of job and a careless attitude towards a common goal i.e. imparting of education. Same questions that is heard over and over again. Who is bothered? What's my advantage? How would I be affected? And more bluntly as what can I do? "It was all a matter of chance." For matters as serious, wherein systems, usage and their efficient mechanism can be effected, there is rarely a situation where a common goal oriented, moralistic work culture and environment prevails.

Principles seldom prevail over practical compulsions and as such when it comes to interaction, ego matters pop in, leaving aside the work to be done and in this way affecting many others. Who is to blame? Decided by none, it is left ignored, rights to be followed and comprehensive environment created is a far story where the self dominates over the feeling of ONE. Who is to finalize work attitude? Should there be an environment where in military like rules are made & implemented, or there to be free, natural flow of humanness, society, work culture built, that prevails over any monitoring and surprise check ups?

Time goes by, issues multiply and "work" gets a second hand treatment. To do this or that shouldn't be a question, when it comes to decision that would deal with running away from one's ethics, whose answer has an affect on common objectives.

System Maintenance Team (SMT) - Good news and Bad news

Corporate freedom as we talk of it means freedom to express, share, to explore life, and to reign supreme in one's own world. The good news as some one said, is that there is no police, watchdog, few laws, great flexibility and power.

As the same people also say the bad news is that there is no police, watchdog, great flexibility and power. The technical ability is not a mandate to act, lack of some laws and bindings does not grant you permission everything. Freedom does not mean loss of judgement. Freedom means, one is expected to use judgement and care, technical ability provides the understanding needed to act, to take ethical decisions, while lack of enforcement should enhance an individual's moralistic and responsible behaviour. For all decisions and actions, there is no excuse for someone not guiding you or forcing you for that. There is no justification for unacceptable behaviour.

(b) Proposed ethical environment

For our educational organization, we come out with proposals in the direction of enhancement of moralistic attitude. We put forward an organisational set up as in Figure 2 with making up of a system maintenance Team(SMT) as in Figure 3.

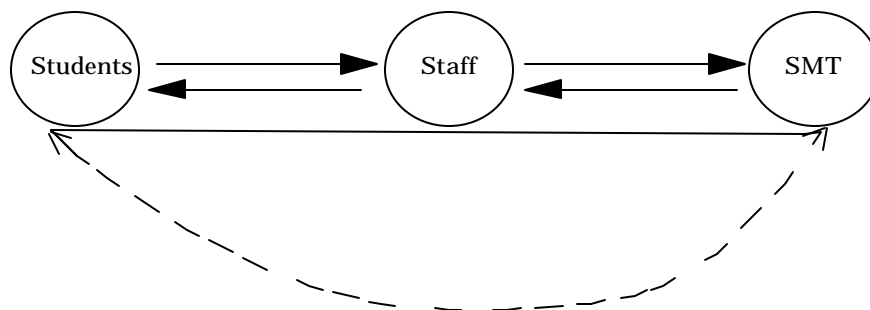


Figure 2: Proposed Organisational Setup

The students need system and other infrastructure to work on. There is a continuous demand of one thing or the other. In case of already available set-up, there needs to be regular maintenance. A selective subset of students group can be teamed up to form a special cell of maintenance committee(SMT) as in Figure 3.

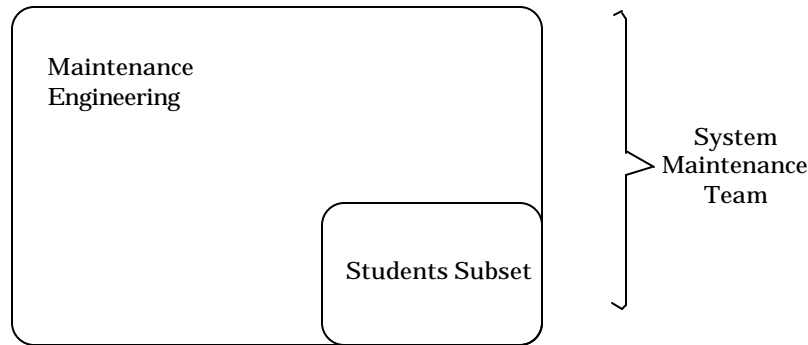


Figure 3: Proposed Organisational Setup: System Maintenance Team (SMT)

The cell should have well defined and structured work definition. There needs to be some regulated area where this team can work and provide active support for the whole infrastructure, possibly gearing up and working towards students' requirements. But in case there is a work requirement that involves working apart and outside of the students' domain, it would be an important addition in itself.

The SMT should be working to achieving its goals with a social outlook in such a set-up like an educational organization, such small teams with well defined and structured plans would do wonders.

The strength of SMT lies upon the symbiotic nature of the work environment, the faith in each others working. This faith shall provide a closer bond between the two different communities. The outlook shall change and positive approaches shall be reflected in each side's behaviour. Not only the void in the attitude would change, but this would be just a beginning where in more closer relationship in others set ups and committees will be seen.

Forming up of such well defined groups and framing of distinct goals would lead to new point of convergence. Convergence of technologies, as we have experienced/noticed provided the incurring break throughs and invention and why not convergence of the outlook, convergence of behaviours that leads to an attitudinal change in the society's work ethics. Faith in each other's environment, and thinking from each other's perspective, shall prove to be an emergence of world, whose roots are formed out of confidence in each other's domain.

An SMT like environment shall definitely be a start towards a figurative organizational structure where faith in one's own work shall be the functional truth.

The Reality Check

Various thoughts of ifs-and-buts are raised. There are concerns about everything from everywhere, also from anywhere.

What if it's not done? What if the student shall know about this? How do I express myself to the students? How would the maintenance committee assess me? These are some of the enormous question pop up whenever SMT is given a thought. Question from both sides are thrown to the world and answers of which seem difficult to frame, yet the solution of which, we believe time would tell. There are problems of student's team being exposed to important documents that are still outside their domain. There are certain examinations held that require an absolute secrecy and code of conduct being maintained. Students form the student team who themselves appear for such exams. may be looked upon with distrust.

But what if the chapter of trust and faith being learnt, discussed at sometime. What if peer-to-peer reviews, assessments are being done? What if some periodic tasks are being given out. There can be discussions about explanation of what maintenance work is, some books, journals can be circulated. These journals may describe certain rules, which should be followed in the surroundings.

Motivation is the key factor that plays an effective role in oozing out the quality in an individual. An enthusiasm drive can be a real stimulus to the communities. For this, special awards can be given to encourage rational thinking. Intellectual seminars could be held out and team values and inspirational video sessions, teaching management skills would go a far way building a positive outlook.

It is the fundamental value of education that can never be outlawed. The strength provided by the teachings very well shape up intellectual and rational honesty. Cultivating a course in a form that is embedded in the current curriculum, shall be a bonus approach. There can be an assessment of the students, in order to gauge what they learn. Though it need not be as strictly graded as curriculum papers, but should be given some weight and adequate importance, in order to instil some spirit of competition among the learning community.

Our Experience

After examining the above environment and studying, the organizational structure, there were some practical experiences that we as an organization faced, in coming up with some decisions. There are some revolving issues that need to be mentioned here:

a) email

Starting with the most prevalent and effective communication medium in today's world, we take up the electronic mail. Email and its advantages to the world in general are awareness. Limiting overselves the staff and student teacher interaction. Students seeking doubts can either ask it in discussion group in staff or can mail his/her doubts and the concerned faculty (group of staff taking a particular module).

Also email can be put to best use when students interact between themselves as well as to the outside world. They are connected to the outside world and can effectively make contact with anyone, anytime, and anywhere.

But do students always make effective use? Does the e-mail facility remain limited for only message receiving and sending? There are numerous cases where junk emails have been sent as well as received. It sounds alarming even when anonymous mails have been sent from outside the network and get received to the internal community (organization) not even sparing the staff and other innocent students.

Email spamming that is actually junk email becomes more annoying when chain emails are being circulated. Another concrete example may be when email facility to use for purpose that may appear small at students levels but becomes more alarming and may take up a serious image at an institutional level. This happens when along with the email, attachments containing pictures, files, obscene literature, issues etc are being sent. Unsolicited email, often of commercial nature, sent indiscriminately to multiple mailing lists, individuals or newsgroup.

Primarily aimed at research, our organization provides limited but adequate resources to students. The staff is engaged in research and development and takes up education and training as work mainly to help in providing effective, best environment and conceptual knowledge together with keeping up to contribute to the IT industry requirement.

With the concern for stopping the hazardous after-effects of emails, the administration devised up some plans. To restrict the size of emails that could be sent was one such step. But not only with staff, also with students, there may be need at times for sending large important files within and across the network. Restricting the size of mails even though the network is very well able to support it, may lead to ineffective utilization of precious resources. The max. utilization of existing resources is important, and if we do not benefit with resources meant for us, it becomes strange and unusual.

Catering to network utilization, when chain emails come to picture, irrelevant mails are clogging the network at all times, the server is heavily loaded, and in turn affects the other important mails. When the same mail comes back to the server, the process repeats itself in a loop state that becomes irritating and annoying.

What can be the solution for this? It's only from the ethics and intellect that one can make decisions to restrict this chaining of letters.

email Privacy

The organization's system administrator has special privileges to monitor and control the network. This is called the "root privilege". There are ways and means to know what emails are being sent, plus the contents, in technical terms, this is called "spoofing". But what about privacy? Where is the thing called "privacy" and "secrecy" that we talk of when we think about emails? Is there any technical limit, which is prescribed for system administrator, about the extent he/she can interfere with emails? The answer is there is no! So this brings us to the thought of how much is the privacy of general people in the organization (other than system administration) secured. It is not binding in any law, any where the extent of system administrator usage of tools to get through the email messages, but even if it becomes then what? Can an employee/student takes advantage of this binding on system administrator? Why not? But why should he/she take system advantages?

This makes us again ponder over the limitations of our usage of rights and our moral responsibilities.

b) Internet

Internet in today's world has become the prime source of information. This is one of the very important resources to keep us updated absent what is presently going on around the world. This source of information holds high value not only to the staff but also to the students. So students should not be deprived of their resources.

To all course participants (as we refer to them, and not students, this is because we give them adequate respect and treat them as mature people) at the start, 24 hours Internet access was provided. This was with the hope of the effective utilization of the important resource, and to help the participants with the resources.

The result: The result would be a heavily loaded server with all irrelevant material. We would discuss the intricate issues related to the irrelevant material later. The network seemed to go slower and slower with all participants hooked on unrelevant web pages.

The action: A strict warning, accompanied by restriction of Internet timings and most importantly, a broadened gap between the administration and the students. Healthy atmosphere got polluted at both sides and that too because of some students only, but the aftermath was oborns by the whole batch.

Provide resources and restrict up to what? If time restrictions would have provided the solution, things could have been easier, but that was of no avail. In 95% of the cases, it has been observed that the sites visited were obscene in material, plus way apart from the curriculum followed.

Technical action: This provides roaming profiles, and keep log information. Certainly this helped up to some point but elements of fear, insecurity widened the gap, this time along with hatred and disrespect at least for some. Also, keeping logs affected the privacy of all those whose mouse clicks were being served.

Leaving aside the issue of restricted timing, since the Internet leads to an open infinite world, enormous information is lying everywhere, just waiting to be searched and put to use. Excitement and sense of "Looking beyond the domain" engulfed the scenario. There were attacks at the server, at the network. Motives being different, after-affects lead to it. It may be due to curiosity of students, who want to learn more, or are trying to see and implement the things themselves. Trying to get excited on imagining having special administrator privileges is a common reason. Sometimes, hatred prevails over all this, and the hacker comes into picture with the sole purpose of damaging the system, environmental set-up and getting to know some important information and data. Some of the different attacks that were reported included:

Host Based Attacks, in which specific machines were being targeted and data was corrupted.

Data acquisition, attempt to steal data.

Attacks on e-commerce websites: Wherein loopholes were detected and attacks launched. This attack primarily arises due to purpose of affecting business.

c) Technology Misuse

Leaving aside the attacks, when we come down to matters that relate to usage of Internet applications, it is worse. Chat clients and application that are being thought of as doing wonders severely affect the usage of resource.

General observation are that 80% of time is spent on chatting on garbage topics. If that had been enough, some action would have been taken. Another "techno-eureka" voice chat was doing the rounds. Bandwidth utilization was going haywire, with lots of traffic seeming to go for wasted purpose.

We can download information. Effectively speaking, it is just a simple click to save i.e. a two-step process to come out with all those beautiful pictures, graphs etc. But the scope up to which it is constructive and valuable information is an obvious doubt. This is observed not only among students, but also among the staff community.

Restricting Internet usage, signalling, warning, screening of data, filtering of information, all seems possible actions to curtail, but would that be enough? Will it serve a long time solution? Doubts still engulf the concerned administration, while again gap keeps on escalating. Faith gets shattered while trust sounds a myth.

These issues cannot be only restricted to the student community, or to the other side i.e. staff. These are universal problems of all organizations as well.

d) Resources

An organizational structure like NCST, resources are not a hinderance to growth. The organization encourages work culture and intelligent efforts. For this to be given boost, there is enough opportunity and support.

But put straight, is the opportunity practically put to use. Are the resources effectively shared and cared of.

Printers are there to document the work. But do the printouts always find a place in the files? Is the printer paper ever accounted? Nobody is there explicitly to keep the accounts of paper printed, but what about the costly ink and ribbon. Thoughts come and go.

Providing means to read online and listen to CDs is a modern approach to learning. But how often are the CDs used other than for entertainment purposes?

Coming to the storage space and magnetic media space. Numerous complaints are heard regarding less memory space and storage area. But if a study is done, it one fact comes out clearly that much of the memory in the world is filled with unwelcome records and data. Who is to report? None. And to Whom? No answer. The work itself goes on. Minds are provoked and questioned, with unquestioned answers and unanswered questions.

Even if some resources are made available for all, it is a common practice to personalize the resources and use it explicitly for one's own purpose or group to which the person belongs. Library books, magazines, journals are no exception to it. Complaints, mails and voices from all and sundry to the concerned authorities are raised. No books available, no enough magazines. Resource crunch is the order of the day. Solution that sounds simple to Librarian is to reduce the number of issuable days.

Result: People are happy to pay the fine and as long as the fine is paid, concerned authorities are happy, possibly because a rule, which has been prevalent for so many years, is not broken. Fine is collected. Sufferers are people, who cry for resource, deprived of it and feel (off in this society) sheepish. But do we note, that it's not mere three phrases that would describe the library discipline viz: "Borrower ID", "Date of Issue", "Due Date". What's required is an effective circulation of the wealth that is present in the libraries around the world. For this possessing of resources, explicitly due to the mind-set prevailing, pressure of competition, and craze of marks or promotion leads to an inhuman tendency developing among people, looking towards and comparing each other. This mindset should change and the outlook enhanced.

Ethical Awareness

Directing our efforts towards ethics, their awareness to people in general and educational organizations in particular, brings us to a common viewpoint.

As we said earlier, a software maintenance team needs to be identified that is evolved out of convergence of the maintenance team and students. This was to bring to an organizational, like ours, an environment wherein; mutual trust in each other's work environment shall bring the ethical bonding.

When it has to be a rational, logical approach towards a solution, it always starts with a deep-rooted education and enlightened atmosphere. For this to be there, we vote towards a universal approach, with strong emphasis on teaching and learning ethics.

The observation made from activities pertaining to the institution like ours has made us come out with certain suggestions for the Ethical Awareness. What may seem questionable at this juncture may be possible to find an answer by looking at these questions:

- a) Why to teach Ethical Theory?
- b) Who should teach ethics?
- c) When and how should ethics be taught in any course, particularly a computer course (from an organizational/ educational institution point of view)?

Beginning to answer each of these questions:

Why teach Ethical Theory: Going back to the motivational quote, we learnt "Man would indeed be in a poor way if he had to be restrained by fear of punishment and hope of reward after death"

Binding rules, fear of punishment after breaking the rules and lure of rewards in following the rules. All this seems ignorable and unwanted, when ethics come into picture. For it is the power of mature thinking, passion to drive the right in moralistic value of oneself, that need of rules and making of rules would not be required.

Teaching ethical theory is an essential part of teaching computer ethics. The theories provide the framework necessary for ethical analysis and decision-making. Through application of ethical theory to cases discussed in class and the ethical case assignment, the desired outcome of encouraging students to develop a personal ethical framework can be achieved.

Who should teach Ethics: Ethics teaching is not in anyway related to preaching some points at a meeting, classroom and wait for the period bell to ring. It demands commitment, faith in one self, and a mature and enthusiastic mind, wherein there is a clear understanding of positive responsibility. A person driven with ethical force and has a rational outlook. All this may not appear uncertain in a person motivated enough to teach ethics. But there is material, discussions, and books on ethical practices, wherein one can learn and gather consciousness.

Ethical behaviour comes with reasoning, questioning, and starting these questions within a group interested in knowing the ethics only adds up to the ethics of all participating in the discussion.

This only gives us a direction to think about the possible answer to the third question. In an ideal world every subject taught in a computing degree should include discussion of ethical, social and professional issues specifically related to the technical content.

This would provide a model of computing professionals as ethical professionals and would ensure that all computing students would take computer ethics seriously. Specifically speaking of ethical studying being taught at school requires dedication and purpose. With the purpose well-defined and social implications known, the studies can start.

The regular curriculum though generally is strictly graded, but for an ethical awareness program, periodic assignments and tasks could be given. Books and journals discussing the severity of violations and ethical issues could be distributed/imparted. There may not be any examination as such, but the discussion may be encouraged by marks allocated for participation and attendance in the discussions. Awards for the best and positive utilization of resources could be given. Acknowledgement of these awards with a talk of giving the award and its justification could be discussed in open. There could be lectures and seminars organised from real life industry people wherein some ethical discussions reached, could be discussed. By depicting ethical and decision-making situation in front of a small group, provides a very interesting response from the group. There could be videos showing real life situation.

Citing an example from an educationist: A video in which there is raised an ethical issue, should be first shown, then stopped at a point where in, decisions had to be made, behaviour and attitudinal pattern could then be studied and given a thought of, presented and explained explicitly mentioning the ethical issue involved.

The program, wave of ethical awareness and encouragement of coming out openly on discussion would be just like imparting self-management training. This would be a definitive step in developing faith and trust not only in oneself but also in others and among the whole society in general. Development of interpersonal communication skills would be an added boon.

Global Outlook

Taking the example of the System Maintenance Team (SMT) that we earlier spoke about, we visualize the people and society becoming more conscious towards ethical behaviour. As dictionary meaning would have it, "Deontological" means ethical theory concerned with duties and rights.

Speaking about this theory, let us explore the issues of rights and duties again. Starting with the hi-tech that we saw to the organizations such as ours, which is a part of this rapidly advancing world, getting to know of our ethics, becoming more concerned towards our duties, rights, responsibilities is important.

As in the words of Donald Gotterbarn, "positive responsibility" emphasizes on the virtue of having or being obliged to have regard for the consequences of one's actions have on others. Ross has argued that this sense of responsibility is consistent with various approaches to ethics eg. both rule based and consequence based theories. The focus of positive responsibility is on what ought to be done rather than blaming or punishing others for irresponsible behaviour.

What can be done, ought to be done, we feel can only be directed. Awareness, consciousness of people in the world is extremely important. Broadening our outlook at a global level requires us to deal with ethical issues not just at communities level, but at a universal level. Thinking in terms of world wide, the start needs to be made some where at the authority level. Well, it requires definitely a meticulous plan to be laid out, since the ethics are perceived deeper within the society. In this cyber age, with all hi-tech people moving fast and versions of "No Time", frequently being heard and said, a global involvement is necessary and desired, the impact of which is seen not only at the institutional level, but starting from the top organization in the strategically more developed sector of the modern world to even those sitting in the most undernourished, uncared place.

For this, to come out successfully, governments, at central and state level should encourage social organizations, community that have spread their awareness among large sections of people. This would have a larger with the common man getting attention. In India, social and morally committed programs like National Social Service (N.S.S.), National Cadet Corps (N.C.C.) could be contacted.

Volunteers in such organizations could be trained and be involved in creating Ethical awareness around the country. The industry people are the reflection of one's country. There are several seminars, conferences, where ethics could be discussed. Moral values, giving concrete examples even video sessions could be held at these places. Many private clubs, where many people meet each other, could be contacted. There are nation and world wide public clubs eg Rotary club and Lions club in India, where people from different communities, social background meet each other and discuss. A concrete discussion on ethical issues could be started, which could then make rounds and spread effectively. Various camps can be employed for the spread of the same.

The discussions should be taken up at the school level itself with kind of lessons at least speaking of the ethical issues and decisions, added virtues, principles, in their Moral Science subject. Some stories could be discussed, with issues of copying in computer programs etc taken up as a small example to discuss the implications and positive and negative impact. Schools, colleges, universities should be made to actively organize programs, and encourage activities, discussing ethics, principles and social issues.

Being social, we live with others, and a rare "example" being set up raises the issue with more purpose and enthusiasm sets in. Such examples should be given, and people motivated at a point to prove as examples themselves.

Media cannot be neglected. The reach of newspapers, radios, and televisions is not new. The concerned authorities can very well put in some articles, programs, channelize it globally and its outcome can be quite enormous. Celebrity community, participating actively in the programs would serve as a catalyst to this issue and there would definitely be a logical, global outcome in positive ethics of society as a whole.

Conclusion

This paper has been concerned with two major points. First there has been an analysis of the different ethical issues in this fast paced, hi-tech world. Adding to this, we discussed the cyber IT laws which have their own implications in this cyber age and raise global issue that have a universal impact.

We took up a case study involving our own experience as an organization diversifying into researches and educated goals and examined the ethics, responsibilities and behavioural patterns of various entities coming into picture at such organizational level.

Our second major stress was on the proposed solution to the issues that we have discussed, both at the organizational level as well at a global university level.

Here we stressed upon how and why ethical awareness should be given emphasis and strongly believe that it could be achieved by mobilizing the masses with education at its base.

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