Getting Technology To Users And Real Life

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Abstract: Procurement and deployment of hardware, software, applications and solutions for the whole academic community is the key for fast, concentrated penetration of new information technologies to developing segments of society. The way to do it is through carefully selected pilot projects performed in co-operation of academic and target communities.

1. Introduction

How to encourage users who have a built computer network, an ensured access to it, free courses and basic usage instructios
at their disposal to start using new information technologies in their everyday life?

Should one invest one's resources into closed groups with potential or try to achieve a mass usage of information technologies?
How to stimulate a new, active and creative way of Net usage? How to direct users and instruct themin order for them to help
themselves and others while using this technology?

How to convince non-information areas that this technology can serve them, too? How to make them realise that the computer
and the Net make a powerful weapon in developing, problem solving and promoting their area of activity?

Who in this country can ensure such a climate where technology wouldn't be a luxsury and knowledge wouldn't be and
expense and how can information technology assist in creating such a climate?

2.The existence of the basic infrastructure

2.1. The built network

There are two Internet providers in Croatia: the Croatian Post and Telecommunication and the Croatian Academic and Research Network- CARNet.

The Croatian Post and Telecommunication is building a network for commercial purposes, while CARNet on the other hand is building a network that would serve the purposes of the academic and research community. The commercial network has been functioning for two years while the academic for five years.
Points of presence of both networks are located in all major Croatian cities.

But CARNet does not stop at modem entrances. Every scientific and research institution has a CARNet connection. In each and every one there is a UNIX machine and every employee and student has a right on an user's account in that institution.

To conclude, Internet is already five years in our country and according to the estimations it has 25000 users.

2.2. The Net is made accessible to everyone

The Croatian Post and Telecommunications allows all individual users to use their own modems at the same price, regardless of how far away they are from the centre.

Although the services CARNet provides are free of charge for everyone, primary users are students, scientists and pupils. The expenses of their communications are only telephone charges which price is the same as the one for the normal telephone communication.

In Croatia, everyone has the possibility to use the Net.

2.3. The common fundamental rules of behaviour

The techniques on how to use Internet services can be learnt through courses or manuals. CARNet provides courses free of charge for its users.

The rules of behaviour on the Net are in the form of recommendations.

There are basic instructions about how to use the Net.

2.4. Mostly passive usage of the Net

Most of the users passively consume the contents that can be found on the Internet. Communication through e-mail is just about the only creative activity.

Every day there are more and more personal Web pages describing people's work and hobbies. On 40 largest servers on CARNet there are 2000 home pages all together.

Hardly any of them contains any kind of data that a visitor could use as a site of reference. One of the examples are the unofficial data of a certain customs officer about regulations in our customs offices. This site has become a place which many use in the absence of an official site with the same information. But even if we assume that there is an official site of that sort, there is still a great possibility that the informal language and the vividness of this private service would provide popularity and visitors to this site.

Institutions are also slowly putting their information on the Net. Information on exam dates as well as scripts can rarely be found on the Net and if so, only in rare subjects and again as a private initiative of the professor.

The conclusion: the infrastructure exists. But its implementation in every day life has not found its place in any segment of the society, not even the one which uses it free of charge.

3. What is missing?

3.1. Educated users

Users who are not afraid of new technologies but seek benefit out of them and are ready to apply them in their everyday life are primarily the educated users.

Apart from basic courses which teach users how to use services it is necessary to create public's point of view on the positive influence of which new technologies have on their lives.

The changes new technologies bring into lives, especially the lives of future generations demand an active participation of every individual in the interminable process of learning.

3.2. Concrete examples as an encouragement for new applications of information technologies

A good example makes long explanations superfluous.

Examples which demonstrate how to use Internet technologies in a certain area encourage people to make use of them in their own area of activity.

Moreover, the ideas that we realised speak for themselves. Dreams can come true even in this country and in the situation we are in.
It is not always necessary to fix our eyes upon the west, developed countries "where milk and honey flow" and everything is possible. Apart from experience it is important to provide examples in one's own milieu in order to encourage self-confidence and clear the way for reaching the goals.

3.3. Application in non-information fields

Information technology spread very slowly into non-information fields.

The usage of these technologies in non-technical fields still causes mistrust and resistance. It is important to provide examples that demonstrate possibilities, encourage the introduction of these technologies primarily through education but also through usage and implementation as opposing to theory and dealing with the tool itself.
The user must experience the great physical and time barriers which he overcomes with help of these technologies.

It is crucial to promote the positive examples. It is also crucial to adjust the educational process of future experts from all areas in use as opposed to computer analysis and then network technique.

3.4 Use of the network by the wide spectra of users

There isn't a person today that can't find something for himself on the Internet, join a certain interest group or correspond with a friend abroad.

It is important to persuade people, after their access to the Net has been ensured, to stay in contact with technology, not be afraid of it, to seek advantage and not fear in new trends.

3.5 Interactive, multimedia educative material on the Net

Multimedia technologies supported by the Net make quality material accessible from anywhere in the world, adjusted to the user, his previous knowledge and interests. Learning becomes more interesting. Through animated examples explanations become clearer. Interactive technique can influence the speed of acquiring knowledge and the Net becomes a significant place where one can acquire knowledge.

It is necessary to reach a critical quantity of educative material in one's own information space in order to make the possibilities obvious and demands for a better quality to force authors in Croatia and abroad to create competition.

4. How to stimulate the expansion of information technologies?

4.1. By investing into universities

How to achieve that words computer, modem, network, Internet don't remind an average man on the miracles of technology, reserved only for supraintelligent individuals or mischievous youngsters .

Thoughtful and planned information technology can improve lives of every individual. Because of insufficient resources the idea is to start from those social groups that are most likely to accept the new- universities. Generations are educated there and they will soon become the most active and most important part of the society.

The Croatian Ministry of Science and Technology encourages and co-ordinates the development and implementation of information technology starting from academic and scientific institutions in the whole society.

4.2. The mass access to technology

The product has to be attainable in order to be sold.

The same is true for technology. If one tries to promote its implementation it has to be reachable. Academic institutions started off with one UNIX machine connected to the Net. At the same time computer classrooms were being equipped. Local networks are being built at this moment which ensure the access to the Net from every workplace. Primarily from classrooms.

Each institution should have at least one information classroom which, when there is no class, is available for students 24 hours a day. The first fully equipped classroom and LCD projector every faculty can obtain without fulfilling any conditions.

The condition for obtaining the next and/or better one is the full exploitation of the old one. It is shown by prepared educational material presented on the Internet.

4.3. Active use of resources

4.3.1. Prepared material on the Net

It is necessary to digitalize at least the existent textual and graphic material in order to make presentations on the projector connected to the computer. It is not an easy task to prepare such a lecture and it requires quite and effort and a large amount of time, but thus prepared material can be given to students to make notes, which enables them to concentrate on the lecturer instead of copying.

Thus prepared material can be put on the Net with little effort for students and colleagues to use. Piling up of the accessible material encourages competition, even on the world level.

4.3.2. Creating new material

Publicised educative material on the Net enables that schoolbooks match abilities and precious knowledge of students and pupils. Thus the role of the teacher of the future is being defined. To estimate the previous knowledge, potentials and then choose the suitable material for his student. The average teacher doesn't create material any more.
Material exists and is supplemented regularly, made by world's foremost experts and formulated by top pedagogues and methodologists.

The additional role of the global knowledge treasury has the ability of full-time education. The wish to master a certain theme from its beginning or to specialise in a certain area can be realised from anywhere in the world.

By providing the necessary equipment and tools and by encouraging individuals with ideas and will, and by suggestions this long-lasting and visionary process of acquiring capital and education material would begin.

4.3.3. The possibility of proving

New technologies allow us to overcome a barrier. The slogan: “Let me try so that I know”, is close to realisation.

Experiments are necessary for testing of the acquired. To make experiments on people is rarely admissible in the beginning of learning. Experiments on animals aren’t ethical. To try out new ideas on existing buildings or nuclear powerplants aren’t recommendable. So where to test the acquired?

Simulation programs allow us to experiment in the absence of reality. It is necessary to introduce them into learning processes in order to obtain at least a starting experience. Questions such as what if trouble everyone. To enable an autonomous way of obtaining answers is crucial for taking a realistic attitude towards the acquired.

In order to enable autonomous learning on the Net it is important to provide methods for performing experiments.

4.3.4. Testing

The classical way of testing, when students are being tested after a certain amount of knowledge has been acquired and in a restrictive time, gives unreliable results.

To ensure accessible ways of testing which one can take when one feels ready and acquire a realistic picture of one’s knowledge comparing it to results of previous tests and instructions how to master what is missing is crucial for a good process of self-teaching.

4.3.5. Team work through projects

An individual can do a lot. It is important to allow him to present his creation to the public by providing a place for him.

But the real big results can be accomplished only through project lead by a well guided team.

Starting of a project, which purpose is for example to create any of the before mentioned requirements will ensure the obtaining of the professional and work experience. This is particularly important for students. Therefore it is important to set up a large number of project where students could with professional leadership start contributing to creating the described information education space.

The Ministry of Science and Technology encourages the work on student’s projects.

4.4. Encouraging co-operation among users

Knowledge of a certain group of people which is active in a certain area of knowledge and is best familiar with its problematic nature and tools can simply be put on the Internet and thus at a disposal of the entire community.

CARNet encourages two kinds of projects which enable users to obtain help in their work from people who are experts in that area.
One kind of projects are infrastructure projects by means of which knowledge and tools necessary in everyday life of a scientific community are being obtained. The other kind of projects are research projects which aim to give an overview over the technology in the world and the possibility of its implementation in Croatia.

4.4.1. Referral centres

Users of a certain program package have needs and help and this help should be provided. The help offered by the producer or the author is far from the real problems. Therefore referral centres are being organised where experts provide help to new users.

Referral centre should provide help with usage of licensed program systems or data bases in a scientific community and cooperate with technical support providers with the producer. Furthermore it is important to teach users how to use those tools and therefore there are always questions. Answers can be obtained through e-mail, WWW or network newspapers.

In some referral centres users can simply and fast access world relevant data bases which are in one central place. Apart from that, centralised resources are necessary for storing and searching large quantities of data.

Thus organised distribution of licenses enables every institution to turn to the referral centre for help instead of buying specialised programs or data and spend months and months in exploring their possibilities. It is saving time and money.
Knowledge is centralised. And users? They can be anywhere they want to.

NAG and Mathematica referral centres are the result of the co-operation between the Department for Physics and the Department for Mathematics of the Faculty of Science, Zagreb.

"Current Contents, Medline and Core Biomedical Collection" is a join project of CARNet and Ruđer Bošković Institute.

4.4.2. Technological centres

There are numerous ways of implementing information technologies in various areas. That means a great number of problems, too.

To explore what is best, most useful and cost-effective in basic technologies is a long-lasting process. It requires a number of experts who would explore the problematic nature of it and provide solutions for concrete problems.

CARNet, through its technological centres provides the necessary knowledge for the implementation of information technologies. The idea is not to make up a new technology but to follow the existing one, new trends, explore the possibilities of implementation, compare and test the existing products.

In order for all that to be possible CARNet co-operates with academic and scientific institutions. The result of that co-operation is the possibility of obtaining latest solutions from the area of fast communication, active network equipment, cryptographic data protection, data compression, electronic ways of paying, local networks with fast transmission and virtual modelling.

4.5. Pilot projects

As mentioned before, CARNet's wide-range fast computer network is not its own purpose. It is an excellent infrastructure which serves various purposes. But in order for all that to be possible it is important to find out where such technology can be applied, if it is worthwhile, safe, useful and finally better that methods used so far.

Since the possibilities of information technologies haven't been fully explored, there is the is some concern as to the lucrativeness of investing into it. How to deal with shortage of means and expertise? How will the realisation of the idea turn out with the implementation of information technology? Who will benefit form the implementation of information technology? These questions CARNet is trying to answer through its pilot projects.

A pilot project must demonstrate the role, way of implementation and benefit of information technologies. A pilot project has to be a novelty in the technical sense or a Croatian uniqueness or a predecessor of a major project on the national level. That means, first attempts of implementation in a certain area, ideas that haven't been realised so far, technical and communicational solutions based on one of the best computer network in Europe.

There are always inquisitive, innovative individuals filled with new ideas which they can't realise. Through these pilot project Carnet is trying to support good ideas by means of providing initial help for their realisation. The only condition is that the goal is clearly defined, that there are deadlines for its realisation and that the results are inspiring for experts as well as the broad public.

Since CARNet's funds are limited only the most interesting projects are being selected.

Owing to the new technology projects themselves as well as their results have to be presented in such a way that information are available even to those who do not use information technologies. Therefore it is necessary to publish promotive material such as leaflets and brochures, deliver lectures, promotion through radio and television and other means of promotion.

In order to have an exact overview of the plans set and their realisation it is necessary that the project be well planned. Experience gained tells us that the ones suggesting projects are not aware of the possible complications and problems and there are delays and failures to realise the goals. But the additional help these projects have to offer is mastering more than one technique at once. In this case it means besides the field of knowledge and technology to overcome problems with managing the project.

5. Conclusion

The Croatian model of introducing new technologies concludes:
-with regard to limited resources introduce the technology into that part of society which will further promote it- teachers and students;
-technology has to be easy to consume in order for it to spread fast;
-basic requirements- equipment, access to resources, courses, they have to be free of charge;
- for a step further it is necessary to take and active role: to be useful to others, participate on projects, publicise information, provide new examples of implementation of the technology;
-it is necessary to build a national infrastructure which will serve as a test-bed for all countries;
-there isn't an institution which can encompass all these activities alone and therefore the Croatian Academic and Research Network has the role of motivating the entire academic community to participate in this enterprise.

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