INSIGHT SPECIAL REPORT

SOFTWARE PATENTS - A POTENTIAL HINDRANCE OF ICT IN EDUCATION

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Currently the European Union is pursuing new legislation to regulate the patentability of software. This paper will explore the effects of the possible European software patent in the field of e-learning, especially focusing on the school sector.

The first section explains the current situation with software patents in Europe, the second section states the goals for European e-learning in a knowledge-driven society, the following section examines three arguments concerning how software patents could potentially harm the European e-learning field, and the final section gives some pointers for future actions.

Keywords: Educational technologies, software patents, Europe, free and open source software, e-learning.

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0. Introduction

Information and communication technologies (ICT) have opened numerous possibilities for education; they enable teachers and learners to learn and explore the world without physical borders. The World Wide Web allows learning that can take place with peers and can be guided by experts from the other side of the globe. The Web has been referred to as "an outstanding technological achievement that directly promotes people's quality of life [...] and encourages sustainable economic development[i]."

Since the early days of software development, ideas have been shared among developers and new products are based on existing ideas.

Things could be very different, though. Had Sir Tim Berners-Lee, the inventor of the Web, put a software patent on his innovation, the use of the Web would probably not be as widespread and as common as it is nowadays.

Patents as such are important, but they are better applied to some fields than the other. Take for an example of the pharmaceutical field; patents are needed to ensure that the money invested into research of a new drug comes back to the company. The software world, however, does not function in the same way. Since the early days of software development, ideas have been shared among developers and new products are based on existing ideas. Software development, it has been argued, is like a combination of ideas and mathematical expressions[ii]. Like any other expression of intellectual achievement, patents are badly placed on software. Hence, the controversy of the case surrounding the European software patents.

1. Software patents and the European situation

Currently, the European Union is pursuing new legislation to regulate the patentability of software. Nowadays software in Europe is protected under copyright law, i.e. the protection is granted under immaterial laws, the same legal concept that protects artworks, literature, etc. Now, however, the European Union would like to change the situation to harmonise a variety of measures existing in member countries to allow American style software patents to be granted in Europe. The argument from the Commission, the initiator of the directive, is that it would boost the innovation and make the European market more competitive.

Patents would become too costly and too labor-intensive for the European software industry which is primarily characterised by small and medium-sized enterprises.

Many practitioners in the software field disagree with the proposed approach by the European Commission which would allow the European Patent Office to grand European-wide software patents. Their arguments are diverse, but the bottom-line is that patents would become too costly and too labor-intensive for the European software industry which is primarily characterised by small and medium-sized enterprises (SMEs)[iii]. Software patents would possibly shift the power of European markets to the hands of a few big corporations, and to the ones

who have accumulated a portfolio of software patents that can be used to extort and sue others in the market who possibly infringe any patents. Eventually, the end-users and customers would carry the cost of patents.

Furthermore, the patents would hinder the innovation that takes place among many software communities, either profit or non-profit, that are based on **open source**. Many European businesses have successfully made open source their business model creating new jobs and fostering innovation. These communities, usually relying heavily on volunteer working, would have little or no resources for patent buildup to protect them against any aggressive attacks, pay for royalty-fees or pay for a costly case in court.

Patents would hinder the innovation that takes place among many software communities in the field of education, either profit or non-profit, that are based on open source.

This could potentially slow down the new innovation in the field of education. It would be unfortunate for the educational sector, which has benefited greatly from free software for office suites, a plethora of educational applications, freely available networking technology, etc. In general, the use of free software in schools is a relatively growing area. In many countries the national and local decision-makers now publicly show their acceptance towards open source software, and in some cases even enforce its use in the public sector[iv]. Under the pressure of ever rising cost open source software has gained a new position in schools.

The discussion on the European software patents has been on-going in Europe already since 2000 when the European Commission introduced the directive. In Spring 2004, the European Parliament voted on a heavily amended directive that would decrease the scope of software patents in Europe. This was in accordance with the wish of many small and medium size businesses as well as the community of open source developers. The multinationals and the big industries in the field, however, were not content with this version, and urged the Council to vote against it during the European Summit in Ireland in Summer 2004. The directive was not adopted, however, and currently, as some of the national governments have withdrawn their support from it, the directive has come to a halt. At this point (Dec 2004) it is still unclear whether the Parliament will restart the whole legislative process again.

2. Towards a knowledge-driven society: schooling the future citizens

European countries have committed themselves to the Lisbon targets to make Europe "the most competitive and dynamic knowledge-driven economy in the world" by 2010[v]. To achieve this, education and training has been put in a central role; with the help of information and communication technologies learning could take place in a variety of forms in schools and universities, in vocational training and at work making learning a lifelong

endeavour.

Achieving a knowledge-driven society does not only require investing in infrastructure and hardware, but also boosting intellectual achievements become crucial. Creating an environment in schools where innovation is allowed and rewarded, where learning takes place not only within the school boundaries but also outside of them, and where constructing one's knowledge is not a solitary effort but part of collaborative interaction with others can provide the means to succeed in today's society as well as in the society of the future. Schools aiming at these targets should also be open organisations rather than being locked into a single view on education. This implies using new technologies to catalyse innovative learning.

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Thus, schools should be a place where freedom of speech and choice is valued, both in the education process and in the means that are used to conduct it. As future communications are increasingly relying on ICT and software, the system of software patents could put us in a situation where a few corporations would gain exclusive control over underlying communication technologies and standards, at the same time gaining power to control the content running on that infrastructure. This could put the free communication, as we know it today, in a grey zone.

3. Software patents and educational field, what's at stake?

The imminent effect of the possible software patents in the field of e-education and e-learning is that software patents could considerably limit the choice of learning technologies in schools. So what is wrong with the claim of major software companies that patents would boost the European economy[vi]? The reasoning behind this claim is the following: patents in the field of computing encourage intellectual property investment and thus, encourage development. One would naturally think that this means also schools would have access to better and enhanced learning technologies.

What is wrong with the argument that the major big software companies have about the usefulness of patents to boost the European economy?

This, however, seems to be the bright interpretation of things, whereas the darker reality could turn out to be different. For the field of education in Europe patents could lead to higher prices for end-users and hindrance of the “in-house” development of educational software that is lead by school and educational authorities at the local, regional, national and European level. Resources being limited in the first place to implement ICTs in public sector such as compulsory education, the ICT penetration would face a further threshold if entering to the world of software patents were the case. For the moment, the educational authorities are struggling to finance the infrastructure and hardware, pay for licensing, get qualified workforce, and train the teachers. The burden placed on educational authorities to deal with patents would add even more pressure.

3.1 Cost of applications could become higher

The situation in schools could change because of the software patent system; the choice of available software could become limited and costs of using underlying communication structures, operating systems and any software could increase. This can be explained by reasoning that software patents would eventually create less competition in the market as they potentially can be very destructive against open source software, which is increasingly gaining place in schools, and they can force some small and medium size businesses out of the market by enforcing the way the patent system works.

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Licenses in general have a tendency to lock customers into a certain product by selling licenses for a short term at the time and tying licences into software upgrades. This, for example, is everyday life for many software users who opt for major commercial products. The customers' lock-in effect reinforces the status-quo in the market, which could be further advanced by software patents. Especially big multinational corporations would benefit from this situation. A hint of the future could be seen from the estimated 20-30 000 software patents[vii] that the European Patent Office (EPO) would grant if the directive such as proposed by the Commission was adopted. On the Top 50 list of companies potentially holding European software patents only eleven (11) are European owned with international focus, most being Americans and Japanese. Just looking into the future beneficiaries, i.e. owners, of European software patents shows how little software patent have to do with boosting European local markets and how much it has to do with multinational corporations trying to gain a grip on the ever –evolving European market.

3.2 Effects on in-house development of educational applications

An interesting feature of European learning technologies field is that there is not one single scheme to fund and implement e-learning in schools, but there is a plethora of models used across Europe. An interesting feature that was discovered in a survey[viii] conducted at the end of 2002 on the use of virtual learning environments (VLE) in schools was that many national educational agencies and Ministries of Education surveyed (10/17) fund the development and localisation of VLEs at a national level. About two thirds of respondent schools (n=500) used an in-house or open source VLE, whereas commercial products represented about one third of the VLEs in the field.

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There is no follow-up data to compare the change in the situation since December 2002, but it is highly probable that the trend has not shifted dramatically since. The software patents, however, would put the current trend in peril. It would be hard for these national and regional authorities to continue this type of development that, in some places, is the only solution to get an

application that has the needed features and the look'n'feel desired? Being protected against any aggressive company who might hold a patent on the technology that is used would not be given for granted. Situations have been seen in other sectors where a mature software product that is widely used has been forced away from the market by a patent holder whose aim is only to make money from court cases or high royalty fees. There is no guarantee for the field of education to stay out of this.

Additionally, the interoperability aspect between different applications and systems that are communicating with outside infrastructures and systems could be sacrificed if patent holders could seek to require license payments as a condition of, for example, implementing Web standards[ix].

What would European software patents mean for the new development? Many of the innovations that are seeking a patent currently in Europe include much used ideas on the Internet such as “related results: show related results if customer likes the current ones[x]”, “support database: network support system using databases[xi]”, formats like MP3[xii] and JPEG[xiii], to mention a few. A very demonstrative example of software patents sought in Europe is available on the website of the Foundation for a Free Information Infrastructure[xiv].

3.3 Use of free and open source software in schools

Free and open source software and its development would be in danger if software patents were in place. The ones holding patents, usually well-to-do multinational corporations, could enforce their patents to push competing open source products away from the markets. This would give the corporations an anti-competitive leverage, and could create a situation where Europe's school infrastructure could become dependent upon the software products of a few major companies who could maintain their monopolies thanks to the patent laws.

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The following essential factors have gained an increasingly growing acceptance within the field of education until now, but they could be jeopardised by the software patents. They can be listed as following:

1. **Availability of software and possibility to localise language version.** A variety of mature open source software is already available for many purposes; it is easy to find tools for schools, too. When dealing with young children, it is of the utmost importance that they have access to the tools in their own language. One special feature of open source in education is the availability of software in many languages, including also small language groups with very limited markets that would probably not attract localisation from the big software industry. For example OpenOffice.org, an office suite, allows

user groups to translate the programme ; there are currently about 100 language versions being developed. Many language versions make open source software also attractive for language learning and teaching purposes.

2. **Freedom from license management**. An often sited benefit of free and open source software is the fact that it allows users to make copies and distribute programmes and simply obviates many of the problems related to piracy, illegal copying and illicit use of software. For schools, software piracy represents a real issue: some schools with small budgets are undoubtedly tempted to install pirated software on school computes to avoid paying for upgrades. Obviously this moral dilemma can be avoided if schools use available alternatives. With open source software schools could give away freely whole distributions of software, including the operating system and any needed applications.

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Another advantage is that students are free to take home any of the open source software that they use at school without infringing software licenses. This enables the students to carry out their homework using the same software as in school. As for the teacher managing the school network, not worrying about licenses means a reduction in workload, as, for example, no record on installed software needs to be kept.

3. **Freedom of technical structure.** The networking tools used in the school infrastructure are overwhelming in both number and quality. Many school servers, for example, run on Linux nowadays. Also Terminal Server and Thin Client-systems can offer interesting opportunities for schools to re-use outdating hardware by connecting low-powered thin client terminals to a Linux server[xv].

4. **Selling services and local job opportunities**. Growing interest in selling services related to open source software is also becoming more prominent in the educational sector. Many software companies now offers both ". org" for open sourcing and ".com" for fee-based services. In Finland[xvi], for example, a small business now sells e-services to local schools. Where the courseware Moodle itself is free to use, the revenue is generated by selling training and guaranteeing that the services run smoothly and the maintenance is taken care of.

4. What can be done to help the situation

Educational communities, interest groups and formal committees could make a clear stand on the issue and put pressure on their national educational.

In Europe and on the national level there is much that individuals can still do to try to influence their governments against software patents or, if the decision is eventually taken, that it be in accordance with the amended version by the European Parliament. It could be envisaged that educational communities could formulate statements conveying their opinion on the issue and let it be heard through many of the educational portals to spread the awareness on the issue. Furthermore, educational communities, interest groups and formal committees committed to e-learning could make a clear stand on the issue and put pressure on their national educational authorities to urge them to move to the right direction in this issue.

There are also European-wide movements working on the grassroots as well as on the political level. Two movements that have supported the European Parliament in the decision-making are worth participating in. Foundation for a Free Information Infrastructure (FFII)[xvii] is a non-profit association registered in several European countries, which is dedicated to the spread of data processing literacy. FFII supports the development of public information goods based on copyright, free competition and open standards. The other movement that has gained momentum is NoSoftwarePatents.com[xviii] that runs a website with clear plain explanations about the reasoning behind the movement and an action line to participate in.

Disclaimer

This report attempts to open the discussion among European Ministries of Education, national educational agencies, school networks and all the e-learning users on the European software patents. **This paper does not necessary claim to represent the views of the European Schoolnet's members/office.**

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[i] *Professor Pekka Tarjanne, Chairman of the International Award Selection Committee, speech for the Millennium Technology Prize that was awarded to Tim Berners-Lee.*
[ii] *http://swpat.ffii.org/*
[iii] *http://www.nosoftwarepatents.com/en/m/dangers/sme.html*
[iv] *See examples at Interchange of Data between Administration: http://europa.eu.int/ida/en/chapter/452*
[v] *http://europa.eu.int/information_society/eeurope/2005/*
[vi] *http://www.patents4innovation.org/*
[vii] *http://swpat.ffii.org/vreji/pikta/perled/*
[viii] *http://www.eun.org/goto.cfm?did=25201*
[ix] http://www.w3.org/Consortium/Patent-Policy-20040205/
[x] *EP628919*
[xi] *EP673135*
[xii] *Covered by numerous patents, e.g. EP287578*
[xiii] *EP266049*
[xiv] *http://webshop.ffii.org/*
[xv] *For example Linux Terminal Server Project (LTSP) http://www.ltsp.org/*
[xvi] *Mediamaisteri Oy, Finland, http://www.mediamaisteri.com/*
[xvii] *FFII, http://www.ffii.org*
[xviii] *http://www.nosoftwarepatents.com/*