Intellectual Property in Software Development: Trends, Strategies and Problems

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Introduction: Background

- since 1999 controversial debate on patentability of computer-implemented inventions (= software patents) in Europe
- decision about a European Directives fails in 2005
- status quo with high legal insecurity remains
- since spring 2006 revival of the consultation about the Community patent in Europe
- first approaches of self-regulation by industry in the United States in order to increase patent quality especially focusing on the software sector
- further expansion of the use of Open Source software also in companies applying patent protection
Introduction: Research Questions

• Has the discussion on extending the patentability to computer-implemented inventions increased the use of patents as a protection instrument in the software sector?
• Is there a change in the factors determining the use of patents as protection instrument in the software sector?
• What are the challenges for policy caused by the results?

• Data bases:
  o survey among German companies producing software conducted in the year 2001 divided in traditional software companies (= primary sector) and companies in the manufacturing sector producing software (= secondary sector) (Blind et al. 2005) (n = 282)
  o subsample of software companies within the fourth Community Innovation Survey conducted in 2005 (n = 142)
Applications of Software Patents at EPO and WIPO

Source: Schmoch, Gauch 2003
Use of various instruments to protect software- and computer-related developments in the year 2000

- secrecy pledge (e.g. labour contracts) or incentives for employees
- lead-time advantages
- customer relations management
- trademarks
- prosecution of copyrights
- know-how contracts
- protection against imitation or decompiling through software
- protection against copying through hardware components (dongle, PLA etc.)
- patented designs, registered utility models
- patents

Source: Blind et al. 2005
Importance of various strategies to protect software- and computer-related developments in the year 2000 (1 = very low, 5 = very high)

- Protection against copying through hardware components (dongle, PLA etc.)
- Customer relations management
- Lead-time advantages
- Protection against imitation or decompiling through software
- Trademarks
- Secrecy pledge (e.g. labour contracts) or incentives for employees
- Know-how contracts
- Prosecution of copyrights
- Patented designs, registered utility models
- Patents

Source: Blind et al. 2005
Use of various instruments to protect software- and computer-related developments in the year 2000 and 2004

Source: Blind et al. 2005 and ZEW/FhG-ISI Mannheim Innovation Panel 2004
Importance of various strategies to protect software- and computer-related developments in the year 2000 and 2004 (share of respondents assessing high or very high relevance)

- Protection against copying through hardware components (dongle, PLA etc.)
- Lead-time advantages
- Protection against imitation or decompiling through software
- Trademarks
- Secrecy pledge (e.g. labour contracts) or incentives for employees
- Prosecution of copyrights
- Patented designs, registered utility models
- Patents

Source: Blind et al. 2005 and ZEW/FhG-ISI Mannheim Innovation Panel 2004
Summary of Changes in the IPR Protection in the Software Sector

- share of companies using patents in the software sector remains constant
- slightly reduced use of other protection instruments
- sharp increase in the assessment of the relevance of patents among the active users
- similar relevance of the other instruments among the active users
Hypotheses on the Demand for Software Patents and its Change

• discussion on software patents increased the fixed cost of using this protection instrument, which is especially negative for SMEs, i.e. the size bias of patent use becomes stronger (H1)

• the option to use patents as additional instrument to appropriate the returns of the investments in R&D is especially attractive for R&D intensive companies (H2)

• the attempt to achieve a harmonised patentability of computer-implemented inventions in Europe increase the pressure of exporting companies to use patents (H3)

• patents become more important the higher the competition intensity companies face (H4)

• software companies active in collaboration with customers (mainly from the manufacturing sector) adopt their protection strategies, i.e. they are more likely to use patents (H5)

• software companies closely involved in collaborations with companies supplying inputs into the own software product or even with competitors are likely to follow open source models, which become more attractive, but are in contradiction with the use of software patents (H6)
Regression Models

Pr (Use$_j$) = D (FC$_j$) \hspace{1cm} (1a)

OrdPr (Imp$_j$) = D (FC$_j$) \hspace{1cm} (1b)

with FC$_j$ as vector of firm characteristics
## Regression Results

<table>
<thead>
<tr>
<th></th>
<th>Use Primary 2000</th>
<th>Importance Primary 2000</th>
<th>Use Primary 2004</th>
<th>Importance Primary 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>0.30***</td>
<td>0.30***</td>
<td>0.51***</td>
<td>0.46***</td>
</tr>
<tr>
<td>R&amp;D intensity</td>
<td>1.13**</td>
<td>1.26**</td>
<td>2.06**</td>
<td>1.90**</td>
</tr>
<tr>
<td>Export share</td>
<td>0.23</td>
<td>0.14</td>
<td>2.59***</td>
<td>2.74***</td>
</tr>
<tr>
<td>Competition intensity</td>
<td>-0.44*</td>
<td>-0.45*</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Collaboration Customers</td>
<td>-0.06</td>
<td>-0.02</td>
<td>0.41</td>
<td>0.49*</td>
</tr>
<tr>
<td>Collaboration Suppliers</td>
<td>-0.07</td>
<td>-0.02</td>
<td>-0.47*</td>
<td>-0.45*</td>
</tr>
<tr>
<td>Collaboration Competitors</td>
<td>0.14</td>
<td>0.02</td>
<td>-1.07</td>
<td>-1.03**</td>
</tr>
</tbody>
</table>
Discussion of Regression Results

- influence of company size on the likelihood and the importance of patents increases (= H1 is confirmed)
- with increasing R&D intensity companies make a more intensive use of patents (= H2 is confirmed)
- export activities influence meanwhile positively the use and the assessment of patents (= H3 is confirmed)
- number of competitors looses influence on the decision to use patents and their assessment ( = H4 is rejected)
- collaboration with customers influences meanwhile positively the use and assessment of patents (= H5 is confirmed)
- intensive collaboration with suppliers and competitors, i.e. following an open source model of software production, reduces meanwhile the likelihood to use patents and the assessment of their importance (= H6 is confirmed)
Policy Challenges

- lengthy discussion about the extension of patentability to computer-implemented inventions did not increase the share of companies making use of this instrument, however patents became more important for the active users.

- size bias in the use of patents increased
  - distortions between patenting and non-patenting and between large and small software firms increased

  - IPR policy has to strengthen its efforts to support SMEs and outsiders of the patent system to deal with IPR issues in the software sector.

- co-existence between following the open source model and applying for patents cannot be observed – at least not for the majority of software companies
  - increased separation and no convergence in the IPR strategies of software companies, i.e. open source models and patenting become substitutes and not complements

  - IPR policy has to provide framework conditions which do not create distortions, but facilitate the collaboration between software companies applying different IPR strategies.