



The non-proprietary perspective of Early stage Innovation

Phenomena of deliberate Patent Infringement  
and Open Source as a Strategic Behaviour – Do  
they undermine the IP system?

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- neglecting the IP system: pay-as-you-go and patent trolls
- Open Source: network externalities and ,freedom of speech'



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In the presence of **network externalities** and **increasing returns to scale**, it is all about being the **first-mover** and incorporating **subsequent innovations** as soon as possible (a.s.a.p.) in order to be state of the art (s.o.t.a.). Uncertainty about whether future innovations can be incorporated into the product lead to the above mentioned strategies, among others (patent pool, etc.).



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## network externalities (revenue)

$$V = n U$$

Sarnoff's law

The value  $V$  of a network depends on the number of users  $U$  multiplied by the factor  $n$ .



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$$V = n 2^U$$

Reed's law

The value  $V$  of a network depends on the exponential number of users  $U$  multiplied by the factor  $n$ .



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increasing returns to scale (costs)

$$TC = f + m x$$

Total costs  $TC$  are fixed costs  $f$  plus marginal costs  $m$  times the amount of goods produced  $m$ . Let's set  $x=U$ :

$$TC = f + n U$$

and determine profits  $P$  by subtracting costs from revenues:

$$P = n U - f - m U$$

$$P = U (n - m) - f$$



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increasing returns to scale (profits)

break-even at  $P=0$

$$0 < U(n - m) - f$$

$$f < U(n - m)$$

$$U(n - m) > f$$

Profits rise above fixed costs with the number of users  $U$  multiplied by the difference between the network factor  $n$  and marginal costs  $m$ .

For many firms in the software industry, fixed costs  $f$ , marginal costs  $m$  are small and the network factor  $n$  is quite big. However, the number of users  $U$  can be in the millions.







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Patents would enter the equation as part of the fixed costs. Assuming that they are the only fixed costs while marginal costs depend on computer capacity, fixed costs might be very small compared to the total profit on the left hand of the equation, given that  $n > m$ .



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Whether this is so depends on four factors:

- the costs of finding out whether patents are infringed upon
- the probability to be found out by the patent holder
- the costs of legal action and compensation payment
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All these factors are clouded in **uncertainty**.



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## Open source (software)

Open source is a production method differing from the traditional models firm and market. Peer production established a net of relationships between creators, without the help of either firm or market.

*Why does this beat the traditional capitalist way of innovating?*



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mainstream (micro-)economics: they buy something else.



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Hirschman: they decide whether to use voice or exit, depending on their loyalty.

- voice: consumers protest quality, make demands (changes)
- exit: consumers switch to alternative product



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In the case of network externalities and increasing returns to scale, there will be more ‚loyalty‘, achieved via ‚lock-in‘ effects.

What is the alternative to *facebook*? What is the #2 open encyclopedia behind *Wikipedia*? What about *xing* for business professionals? How to migrate your blog to a third party, switch to another web browser or e-mail provider? How can I migrate from *itunes* to an alternative?



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There is a significant investment on part of the consumer in the use of new services. **Voice** becomes a stronger option, since **exit** means you forgo significant investments of your human capital into software use.



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Every new innovation means that those that do not implement it face deteriorating quality of their service. The frequency of innovations has greatly increased. Loyalty keeps people connected to the service and can only be build if people expect your service to be s.o.t.a.



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‚Hold-up‘ by patent owners will lead to consumers/creators to leave your service, since you are falling behind. **Voice** is not heard, **exit** the only option.





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Friedman/Hayek claimed that markets organize best.

Hirschman claims that people who make their voice heard know best.





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Changes in technology (network externalities, increasing returns to scale), culture and institutions, transaction costs and goods and services demanded lead to changes in the comparative advantages of an IP system vis-a-vis open methods of production.



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(I don't believe in the market or open source as the holy grail.)



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## Summing up

The open method – as well as rational ignorance – undermine the IP system.



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It seems that today open production is superior to the use of a market with institutions that guarantee for IP in some cases where the organization of knowledge and information is crucial. Network externalities and increasing returns to scale are the economic explanations, changing the relative weights of **Exit** and **Voice**.



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At this moment, I believe co-existence will result for decades to come.