

Economies of Scale in Thailand Open Source

Virach Sornlertlamvanich and Sineenat Tienkouw
Information and Mobile Application,
National Electronics and Computer Technology Center,
National Science and Technology Development Agency,
Ministry of Science and Technology, Thailand

Email: {virach.sornlertlamvanich, sineenat.tienkouw}@nectec.or.th}@nectec.or.th

Abstract

Basic definition of open source software is a kind of software which is redistributable and its source code is free for everyone to run, to study, to improve, and to redistribute. Although the open source software has such a sense of freedom, open source software is able to be traded in markets. The economics of open source software is concerned.

This paper makes a preliminary discussion of the economies of scale in Thailand open source software. We propose a concept and analyze the key factors which can explain the economies of scale in open source software in Thailand in the past few years.

Key Words:

Open source software; Economies of Scale

1. Introduction

Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower costs, and an end to predatory vendor lock-in [1].¹ According to the definition, numerous organizations as well as government agencies in various countries have an effort to encourage open source software development and dissemination.

Key advantages of open source software include high reliability, reduction in development cost via the

reusability of the existing proven code. Moreover, the open source software tends to enhance software business and industry competitiveness with the ability to leverage the improvement of the existing code.

All of the advantages of open source software are indeed considerable, and there is an important issue to be more concerned about the economics of open source software.

In this paper, we will discuss about the existing of open source in Thailand in the perspective of economy.

The paper is organized in five sections to propose a concept of what are the key related factors to the economies of scale in Thailand open source software and how the economies of scale can be achieved in Thailand open source software.

2. Concept of Economies of Scale

Economies of scale, also called *increasing returns to scale*, is a term used by economists to refer to the situation in which the cost of producing an additional unit of output (i.e., the *marginal cost*) of a product (i.e., a good or service) decreases as the volume of output (i.e., the *scale* of production) increases [2].

In “*the Wealth of Nations*” by Adam Smith, *father of Modern Economics*, explained the principle of Economies of scale that the division of labor and specialization is the key factors to achieve a higher return on production.

In addition to specialization and the division of labor, within any company there are various inputs that may result in the production of a good and/or service. The inputs are *lower inputs cost*, *costly inputs*, *specialized inputs*, *techniques and organizational inputs*, and *learning inputs* [3].

- **Lower inputs cost:** When a company buys inputs in bulk, it can take advantage of volume discounts.
- **Costly inputs:** Some inputs, such as research and development, advertising, managerial

¹ The Open Source definition is given by the Open Source Initiative (OSI) which is a California public benefit corporation. OSI has noticed that Open source doesn't just mean access to the source code. The distribution terms of open-source software must comply with the following criteria: Free Redistribution, Source Code, Derived Works, Integrity of The Author's Source Code, No Discrimination Against Persons or Groups, No Discrimination Against Fields of Endeavor, Distribution of License, License Must Not Be Specific to a Product, License Must Not Restrict Other Software, and License Must Be Technology-Neutral.

expertise and skilled labor are expensive, but because of the possibility of increased efficiency with such inputs, they can lead to a decrease in the average cost of production and selling. If a company is able to spread the cost of such inputs over an increase in its production units, economies of scale can be realized.

- **Specialized inputs:** As the scale of production of a company increases, a company can employ the use of specialized labor and machinery resulting in greater efficiency. This is because workers would be better qualified for a specific job and would no longer be spending extra time learning to do work not within their specialization.
- **Techniques and organizational inputs:** With a larger scale of production, a company may also apply better organizational skills to its resources, such as a clear-cut chain of command, while improving its techniques for production and distribution.
- **Learning inputs:** Similar to improved organization and technique, with time, the learning processes related to production, selling and distribution can result in improved efficiency.

3. Open Source Software Status and Endeavor in Thailand

In Thailand, there are various open source software key players to promote open source software such as Ministry of Science and Technology, Ministry of Information and Communication Technology, Thailand Open Source Software Federation (TOSF), Thai Open Source Alliance (TOSA), Open Source Software Network (OSSN), Linux Competition (nlc.opentle.org), Software Developer Community (linux.thai.net), Prince of Songkhla University Linux User Group (PSU-LUG), the Federation of Thai Industries, and as well as many other universities and schools. These key players can be grouped into three categories, which are government, academic, and business sectors.

The leading organization in the government sector is National Electronics and Computer Technology Center (NECTEC), National Science and Technology Development Agency (NSTDA), affiliated with Ministry of Science and Technology. NECTEC's role is developing and maintaining the Thai Language Extension (TLE) of Linux operating system and office productivity suite, OfficeTLE based on OpenOffice.org. LinuxTLE was developed

specifically for desktop use and LinuxSIS (School Internet Server, it is now called Simple Internet Server) was developed for server use.

For desktop use, in the year 2008, they have 80% and 50% target to replace proprietary software by OpenOffice.org in NECTEC and NSTDA respectively. For server use, following by School Linux Server Project, NECTEC successfully assisted 921 schools to save their server software expense, excluding client access license, for about 100 million baht in the year 2005.

Apart from NECTEC, Electricity Generating Authority of Thailand (EGAT) also supports Open Source software use and development for internal operations. EGAT has been installed OpenOffice.org for newly purchased PC for years. As a result, they are able to save the cost of 3,000 license fee per year for about 36 million baht. In the year 2009, they have targeted to have 100% replacement by OpenOffice.org.

In academic sector, leading universities, such as Kasetsart University, Burapha University, and Prince of Songkhla University, have developed their own Linux distribution for using within campus and promoting the use of open source software in other universities. The current open source software projects include, but not limited to, Beowulf Linux Cluster Project from Kasetsart University, and Burapha Linux from Burapha University.

As for Business sector, following suit of software houses and internet café, are turning to open source software for their daily productivity and development tools, such as groupware and server solutions as developed by Ice Solutions, packages for small and medium businesses (SMEs) by Micro-X Co. Ltd., and office productivity suite Pladao (based on OpenOffice.org). The list of such examples is becoming longer and longer.

4. Economies of Scale in Open Source Software

Open source software development enhances the ability of software developers to create new applications. It also enhances the development and dissemination of knowledge and ideas more broadly. Since the benefits to the broader software development community and the economy as a whole go well beyond the users of an individual software product, a policy that subsidizes open source development would increase economic efficiency [4].

According to the information of open source software status and endeavor in Thailand referred in the earlier section, we have analyzed the economies of scale derived from the open source software as a supply side that the open source software communities or networks makes the lower the cost of

open source software production because, *by the concept of economies of scale*, they have greater specialization labor, *or programmers/developers in this case*, and greater ease channel of learning and sharing from other developers. We can see the phenomenon from the various key players in Thailand who play role in promoting open source software using and development.

By considering the key inputs effect in the production of open source software and its service, the economies of scale in Thailand open source software have been achieved with the following result of these inputs:

- **Lower inputs cost:**

An open source project may well lower the cost for the programmer, for two reasons [5]:

i) *“Alumni effect”*: Because the code is freely available to all, it can be used in schools and universities for learning purposes; so it is familiar to programmers.

ii) *“Customization and bug-fixing benefits”*: The cost of contributing to open source project can be offset if the activity brings about a private benefit (bug fixing, customization) for the programmers and their firm. Note again that this factor of cost reduction is directly linked to the openness of the source code.

As the two reasons to reduce the inputs cost, we can analyzed that open source project in Thailand in government, academic, and business sector are able to reduce or even save their cost of programming such as for LinuxTLE, LinuxSIS, or OfficeTLE. In the perspective of business, it is beneficial to take the reduced or saved cost for providing the higher level of commercial service in an acceptable and reasonable price to users/clients.

- **Costly inputs:**

The various open source software communities and networks in Thailand like TOSA, OSSN, Linux.thai.net, and etc. are good example of open source software community or network in Thailand which consistently conduct activities to give and share knowledge and experience in open source software development. Having the strong community or network is able to spread the cost of software production because there are many open source software experts and alliances in such community or network for doing a research and development, advertising, and managerial expertise which are expensive inputs.

- **Specialized inputs:**

Note again that the strong open source software communities or networks in Thailand have many specialized inputs like programmers and software developers to connect each other and

contribute their time to develop the open source software.

The key element of the open source process, as an ideal type, is voluntary participation and voluntary selection of tasks [6]. So it might be interpreted that in the ideal world of open source software there is no any costs for specialized inputs especially specialized labor.

- **Techniques and organizational inputs:**

Sharing source code is one of characteristics of open source software which the source code is released to all who chooses to use it. It makes experts can improve the software and share it with the community so that generating the better software. The larger scale of open source software production will be achieved with a lower cost by applying the new techniques that shared in the community or network to improve the software.

- **Learning inputs:**

We, definitely, have gained a benefit in the context of *learning* from open source software. Like an experience of EGAT, NSTDA, NECTEC, their employees have the learning process by using OpenOffice.org for a while. Training cost is an essence of learning inputs in both developer and user. Economies of scale will be realized if the organization can find some learning techniques which are effective and efficiency.

5. Conclusion

By the supply side, open source software can be explained shortly by the principle of economies of scale that with larger scale of production, while a commercial proprietary software business has to put much cost in production process, an open source software business makes the lower cost because they obviously use more specialization and division of labor such as spreading the cost of advertising and promotion, sharing source codes and ideas to improve software between experts with no charges, and increasing the specialization of programmers through the existing open source software communities/networks in Thailand [7].

6. References

- [1] The Open Source Initiative (OSI), “The Open Source Definition”, <http://www.opensource.org/docs/definition.php>
- [2] The Linux Information Project (LINFO), “Economies of Scale Definition”, http://www.linfo.org/economies_of_scale.html
- [3] Reem Heakal, “What are Economies of Scale?”, <http://www.investopedia.com/article/03/012703.asp>
- [4] John S. Irons and Carl Malamud, “An Open Source Tax Credit”, <http://www.americanprogress.org/issues/2006/03/b1468377.html>

[5] Josh Lerner and Jean Tirole, “The Simple Economies of Open Source”, Harvard Business School and NBER, <http://www.people.hbs.edu/jlerner/simple.html>

[6] Steven Weber, “Open Source Software in Developing Economics”, University of California, Berkeley, http://programs.ssrc.org/itic/publications/ITST_materials/webernote2.pdf

[7] Virach Sornlertlamvanich, Thatsanee Charoenporn, and Supakorn Siddhichai, “Open Source Software: towards Self-reliance and Industrialization”, Asia Open Source Software Symposium 2003, NECTEC-CICC, Dusit Laguna Resort Hotel, Phuket, Thailand, 3-6, March 2003