

International Trade & Business Model with Special Reference to Operating System Software Products

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Abstract

Business model essentially deals with value creation and distribution of product or service. Value creation and distribution of operating system products seems to be a complex set of activities. This could be due to the process of software development process which takes place across borders. This paper makes an attempt to analyse the issues connected with value creation and distribution of operating system software from international trade perspectives. The policies and role of World Trade Organization (WTO) has been discussed in the paper. The research concludes that Information Technology Agreement (ITA) plays a significant role in value creation process for operating system products. Value creation process is expressed through software features. Standardisation of operating system product features are linked with international trade policies due to the global product usage. This also is directly connected with the acceptance of product. Therefore, it is necessary for international trade organisations to have more clarity of the policies related to exchange of system software products.

Keywords: International trade, operating system, software patenting, software licensing & ITA.

International Trade and Business Model:

Business model essentially deals with value creation and distribution of product or service. Operating system products are truly global products. The product is conceived and designed by technical engineers across various countries. The product is exchanged across borders. The product exchange can be complete software or semi-finished software. Therefore, the value creation and distribution activities of system software products are across borders.

The policies of international trade will have an impact on value creation and distribution of system software. Therefore, it is essential to examine the relationship between international trade and business model. There are many countries involved in the exchange of system software. System software is a technology product. The international trade of technology is mostly governed by World Trade Organization (WTO).

World Trade Organization (WTO) is a body established to manage standards and policies for international trade.

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In order to cater to the trade policies for technology, Information technology agreement (ITA) was formed. US, Europe and Japan countries were technology oriented countries post 1990's. They had many agreements related to manufacturing of semiconductor and other computer related technologies. These countries were able to foresee that technology will be one of the drivers of global economy. Hence, they contemplated having technology agreement for easier exchange of technology.

Information technology agreement (ITA) was a significant trade agreement signed by 14 WTO member states. This was the first sectoral agreement to be successfully negotiated between developed and developing countries. It was also the first agreement to fully liberalize trade in a specific sector. After the Uruguay Round, ITA provided participants to completely remove duties on information technology (IT) products covered by the Agreement. There are currently 74 participants – representing 7 per cent of world trade in IT products. (Information Technology Agreement, 1996).

The product categories identified by the ITA are:

- Computers,
- Semiconductors,
- Semiconductor manufacturing equipment,
- Telecommunication apparatus,
- Instruments and apparatus,
- Data-storage media and software, and
- Parts and accessories.

The categories are evolving over a period of time. It is a challenge for ITA to identify the appropriate classification due to the complexity and fast pace of changing technology. Computers and Data-storage media and software are relevant in the present context of study. ITA's Computers category focuses more on hardware integration activities and data storage-media and software focuses on software in physical support. ITA policies are evolving over a period of time. The policy formulation are challenging for technology products due to complexity of product. WTO's objective is to make technology accessible across all the countries more easily from economic and utility perspectives. One of the challenges with respect to technology products

is presence of global production network (GPN). The technology is conceived and developed across different countries. The intermediate technology goods cross many borders for value addition processes and final product is made available in a country other than the countries where value addition processes took place. In order to measure the impact of GPN on trade, ITA identified vertical specialization (VS) to measure the value added activities across borders. VS calculated as the percentage value of imports directly and indirectly embedded in the exports of a country. In addition to GPN, ITA faces a challenge in classification of technology. The classification is difficult due to technology complexity and interrelation between technologies.

The policies of ITA are directly related with system software. ITA might identify standard features of software and all the organizations competing have to consider standard features and develop product. Standardization of product features would affect the product offer in turn will have an impact on business model.

The categories lack clarity with respect to software. The classification of software is more towards the physical exchange of software. However, the software can be made available without physical exchange over internet. This could be one of the major limitations to interpret ITA for a software exchange. The Classification of computers focuses on exchange of hardware technology across borders.

A few studies were conducted to measure the impact of ITA on international trade. Joseph and Parayil (2006) argued that there is no change in the demand for ITA products post agreement. However, ITA will help and cannot drive technology product demand across borders. There are other factors such as poor infrastructure, institutions, human capital and policies that might influence the demand of ITA products. Bora and Liu (2006) used gravity regression model to measure the impact of ITA. The results of the study showed that the participation in ITA has increased bilateral trade.

The other aspect of ITA which needs to be considered is the dominance of a few countries in the international trade. US, EU and Japan were the pioneering countries of ITA. The basic purpose of trade agreements was to

facilitate easy exchange of technology across borders creating value for all trading countries. One of the unique features of technology is “standardization” of technology features. The standardization features establishes the basic architecture of technology. Technology architecture is a framework that describes the interaction and interconnectivity of components in technology. Generally, the country that establishes the technology standardization will have first mover advantage. The standard features set are generally based on the technology standard set in domestic market. The countries involved in ITA would like to establish technology standard. Once the standard is accepted and established, the country which has set standard will have competitive advantage. There are several factors that influence the acceptance of standard. A few of the factors could be customer lock-in, critical mass, demand of technology in domestic market. Many countries compete to establish technology standards. China is one of countries competing to establish technology standards. It is one of the key players in ITA. Suttmeier and Xiangkui (2004) call the attempt of China to establish standards as “neo-techno-nationalism”. It is a technological development in support of national economic and security interests which is pursued through leveraging the opportunities presented by globalization for national advantage. China is giving special attention to domestic software market. The software standard can be set if there is a strong domestic software market. The standards set at the domestic market will be followed by technology organization to manufacture hardware and software. Hardware and software operate as per the standard set by China. These hardware and software are used by US and European. Hence, US and Europe have to accept and incorporate these standards in their technology products. For instance, WLAN authentication and privacy infrastructure (WAPI) standard set by China for wireless devices. The importers of this technology have to adopt WAPI since the wireless device manufacturers in China would manufacture devices according to WAPI standards. A few thinkers opine that this is a gross violation of WTO agreement, however, none of the importers of technology which is based standard set by China have reported yet formally.

China is also engaged in developing alternative to Windows operating system. China-Japan-Korea open source software promotion partnership is established to find alternative to Windows. The partnership works on open source platforms such as Linux operating system to establish technology standards. Due to large domestic demand, China is capable of firmly establishing standards for Linux operating system. It is a challenge for the established standards of Windows. There exists open source movement across the globe. China does not want to miss this opportunity to establish its standard and control on software. Kylin is a Linux based operating system developed by China. Recently, Ubuntu had a deal with China to develop Ubuntu- Kylin for China. This is an attempt to replace Windows and establish open source based standards across technology industry.

Due to ITA and WTO, technology is freely exchanged across countries with appropriate tariff measures. Technology exchange has many dimensions that influence the acceptance of technology across the globe. From business model perspective, the technology policies of ITA will influence value creation and distribution process. There are not many restrictions in terms of distribution as such. The distribution is mainly governed through global licenses. These licenses are universally accepted. The other aspect of business model is value creation process. International trade policies are significantly related with value creation process. Technology is exchanged across borders for value adding processes. ITA essentially defines the framework of exchange of technology by GPN. However, GPN has to follow technology standards to add value to technology. The technology standard is strongly influenced by a country which is aggressively promoting its standards. The competing organizations have to follow global technology standards to produce their technology product. Hence, the business model has to consider the global technology standard for the value creation process of system software product in the upstream of value chain.

Legal Environment and Software Products

There are two aspects of legal framework for software. One is software license and the other is software patent. These two aspects have been discussed below.

Legal framework of Licenses

Legal framework will not have any impact on licensing policies of organization among software products. Microsoft, Apple and Linux are the major players in operating system software market. Licensing policies of Microsoft, Apple and Linux are global licenses. However, there is a geography specific usage license which will be specified in the license agreement. The geography specific usage restricts usage of license to the agreed upon location of use. The user can also purchase global licenses which can be easily used and transferred across geographical boundaries.

Software enables users to use computers efficiently and effectively. The usage is dependent on many factors. The existing literature indicates that one of the main factors that drive usage is interface across platform. This is related to the compatibility feature of software. The compatibility factor might lead to customer lock-in. The software might force users to use a specific hardware or software and restrict them to use hardware and software based user's choice. This is one of the technical constraints in software. The situation of compatibility might lead to monopoly. A few of the studies indicate that Microsoft was able to establish monopoly due to technical compatibility constraints erected by its operating system products.

Microsoft in its annual report of 2012 stated that many antitrust and unfair competition class action lawsuits were filed against Microsoft across various state, federal, and Canadian courts by direct and indirect purchasers of PC operating system and other specific software products between 1999 and 2005. All claims in the US have been settled dismissed. It has been estimated that total cost to resolve charges range between \$1.9 billion and \$2.0 billion. At June 30, 2012, it recorded a liability related to these claims of approximately \$500 million. The software product strategy using compatibility feature might be perceived as anticompetitive strategy in legal framework. Microsoft has been facing legal issues within and outside United States. As it is reported in its 2012 Annual report, the European commission was concerned about the inclusion of web browsing software. Based on this the Microsoft displayed an option of browser choice screen to users across all

the personal computers in Europe which has Microsoft operating system. Microsoft failed to provide this option for Windows 7 preloaded PCs due to technical error. However, Microsoft did provide the Microsoft fixed this error as soon as it noticed. After fixing the error users got an option on screen to choose the browser application. However, on July 17, 2012, European Commission announced that it had opened proceedings to investigate whether Microsoft had failed to comply with this commitment. The Commission mentioned that if any company is found to have breached a legally binding commitment, the company may be fined up to 10% of its worldwide annual revenue.

The journey of Microsoft has not been trouble free. The legal issues related to Apple Mac OS or Linux has been very negligible. One of the reasons could be the open access to source code. Apple Mac OS has been developing compatible interface to avoid compatibility constraints. However, Apple does have legal cases pending against their other products like iPhone, iPad etc.

The other aspect of legal framework is country specific. In the context of software, legal framework considers two components. One, software product and second its distribution in the country. Software product is evaluated based on features and functionality of product. A few countries' legal framework may not accept the bundling of software applications with operating system. It might restrict user's choice to use software application. Case against Microsoft at European Union cited above is an illustration legal interpretation/framework of product features and functionality. There are not notable cases against Microsoft in India. In fact, one of the major challenges for Microsoft in India is piracy. There have been many cases filed by Microsoft against Indian vendors for software piracy. Business Software Alliance (BSA) reports India has 63% piracy rate in PC software.

The second component of software license legal framework is distribution of software. Software is a global product. It is exchanged across borders in different formats. The law of the land determines legal requirements of software distribution. In Indian context, software attracts import duty if it is purchased outside Indian border. However, the software is purchased in

various forms. Generally, the software is distributed through CD/DVD, OEM or download. CD/DVD and OEM will attract custom tax and free download may not come under the purview of the categories identified. Ministry of Finance under Circular No. 15 /2011-Customs dated 18 March 2011 clarifies the custom duty requirements and tax exemption for the sale of imported software in any form in India. The paper licenses, CD/DVD and OEM licenses fall under the categories where import duty has to be paid and service tax exemption/discount may be provided for resale of imported software.

Legal framework of Software patents

Patenting of software is most debated issue and has not yielded common grounds of understanding and implementation of software patents. Software patents have been examined from TRIPS and domestic patenting laws adopted by countries.

TRIPS and Software

Trade Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO) which was formed in the year 1995. At present there are over 155 countries under TRIPS. TRIPS agreement provides intellectual property law in international trading system. TRIPS requires WTO members to give copyright, covering content producers which includes performers, producers of sound recordings and broadcasting organizations; industrial designs; integrated circuit layout-designs; patents; new plant varieties; trademarks; trade dress; and undisclosed or confidential information. TRIPS also mention enforcement procedures, solutions, and dispute resolution procedures. Protection and enforcement of intellectual property rights will meet the objectives to promote technological innovation and transfer and dissemination of technology, for the mutual advantage of producers and users of technological knowledge and in a way which will be conducive to social and economic welfare. (Wikipedia, 2014)20.

Patenting software is a complex process. According to Article 10 of TRIPS agreement, software is classified under the category of Arts not under technology category. Lack of clarity on software in TRIPS agreement has created vacuum for interpretation of

Law. The domestic law interprets software component of TRIPS according to its convenience. The agreement fails to categorize software appropriately. Therefore, it is difficult to identify the copyrighted or patented components of software. The software producers are unable to patent their source code due to lack of clarity in TRIPS agreement. Reichman (1995) states that software code cannot be patented. However, the software usage behavior of customer can be patented. Software usage behavior is related with the interface and interconnection with multiple platforms. The user pays for the interface not just the software code alone.

Software patenting has been interpreted in several ways by countries. There has been disagreement on software patenting across many nations. A few countries are advocating open standards of software, where patenting will not have any relevance. A few countries do have patenting framework for software but lacks the clarity of what has to be included in patenting. There are two major agencies granting software patenting. One is confined to European region known as European Patent Office (EPO) which grants software patents and the other is for US region known as United States Patent and Trademark Office (USPTO).

Gert Kollé (1977) was one of the early advocates of open standards. Kollé argued that software patenting cannot exist. The software does data processing through instructions. The instructions are in the form of source code. The source code cannot be compiled by one individual or organization. It involves a group of programmers. The source code is compiled from various authors/programmer. The author cannot be singled out and grant patent for a specific source code. The source code will also be integrated with hardware. Therefore, the patenting process gets more complicated.

According to en.swpat.org, In USA, the patent office is the authority which grants software patents and they have been upheld many times in lower courts., However, the Supreme Court never gave a verdict on whether a software is patentable or no. The European Patent Office is an authority that grants software patents in Europe. Most of the Courts in Germany have rejected them, but a few courts in the UK have upheld them. There is always uncertainty of the decisions. The patent holders are afraid of losing their patents and

therefore they avoid going to court. However this may lead to more problems. There is always possibility of Software patent holders misusing the patent. They can threaten software developers, and they can demand sums of money. If the software developer doesn't have enough financial strength to defend themselves in court, resulting in the patent holder winning and will get money or market control though their patent is probably invalid. The other side of the issue is that the software developers are afraid of adding some compatible features due to the threat by patent holders. They are afraid of the cost involved in resolving legal issues. Therefore, they might exclude some of the applications or compatibility features.

There have been numerous studies and discussion on software patenting. Neither academia nor industry has resolved to a basic framework of software patenting. This will directly impact consumer. The usage of software is dependent on software features. However, the software features such as interface and interoperability are linked with licensing and patenting. If the software developing organization is unable to have clarity on patenting, then the organization may not develop software as a bundle of many applications and features due to the fear of legal issues arising out of patenting. Some of the applications and features bundled in software may be patented and may not be disclosed. Mark Shuttleworth states that Microsoft is involved in an activity of racketeering. He says that Microsoft is asking to pay for patents but do not specify which features are patented.

Generally Microsoft is blamed for Patent trolls. Patent trolls are mechanism where organizations acquire patents to extract money from product developers. In the context of software, Microsoft is engaging patent trolls. It is apparent from a few of the cases filed in the court. For instance, Microsoft sued Melco group which deals with network attached storage devices. Microsoft said that Melco uses Linux operating system and a few of the functionality and features used in the system are patented by Microsoft. However, Microsoft has not declared the details of patents infringed by Melco. Patenting of software might result in customer lock-in. The features and functionality will be controlled through the patents. The software will be made available with

product developers who abide by the patents and pay the required usage fees to add patented feature in their product.

It is evident from the facts that software patenting is a complex activity and will have direct impact on consumers. The software patenting revolves around the functionality and features of software.

The functionality and features can be managed through licensing. Therefore, licensing could be a substitute for copyright or patenting. Most of the licensing policies are universal. Therefore, the licensing terms might also cover the internationally traded software. WTO can incorporate software under appropriate category and provide the licensing framework for internationally traded software or technology. The clarity must be established in order to establish common ground to interpret copyright and patenting of software products.

Conclusion

This research paper makes an attempt to identify and analyze the issues related to operating system products from international trade perspectives. It has been identified that ITA plays a significant role in value creation process for operating system products. Value creation process is expressed through software features. Standardisation of operating system product features are linked with international trade policies due to the global product usage. This also is directly connected with the acceptance of product. Therefore, it is necessary for international trade organisation to have more clarity of the policies related to exchange of system software products. In the absence of clarity a few dominant players of the industry will capture the market and sustain its monopoly for a long period of time. Software patenting constitutes significant component in the distribution of operating system product. TRIPS need to pay attention towards software products and bring in more clarity related to software patenting.

References

- Bora, Bijit; & Liu, Xueping. (2006). Evaluating the Impact of the WTO Information Technology Agreement. WTO Working Paper. Accessed from www.wto.org on 15 January 2013.
- Information technology agreement. (1996). WTO Information Technology Agreement. Retrieved from http://www.wto.org/english/tratop_e/inftec_e/inftec_e.htm on 15 December 2013.
- Jaikumar Vijayan, (2008), Microsoft Can't Claim Victory in Security Battle, Computerworld, EBSCO Publishing. June 30/ July 7.
- Joseph, K.J. and Paraxial G. 2006. Trade Liberalization and Digital Divide: An Analysis of Information Technology Agreement of WTO. Centre for Development Studies, Working Paper: 381. Retrieved from <http://mobile.opendocs.ids.ac.uk/> on 18 December 2013.
- Klein Benjamin, (2001). The Microsoft Case: What Can a Dominant Firm Do to Defend Its Market Position? The Journal of Economic Perspectives. Vol. 15, No.2, 45-62.
- Kolle Gert. (1977). Technology, Data Processing and Patent Law - Remarks at the Disposal Program - Decision of the Federal. Retrieved from <http://eupat.ffii.org/papers/grur-kolle77> on 20 February 2014.
- Patagundi, Basanna. (2014). Strategies for Sustenance of Market Share: A Study of Operating System Products. PhD Thesis. Manipal University, Manipal, India.
- Reichaman J.H. (1995). The Know-How Gap in the TRIPS Agreement- Why Software Fared Badly. Paper presented at 7th Annual Computer Law Symposium, University of California, SanFrancisco, California.
- Suttmeier, Richard P. and Yao, Xiangkui. (May, 2004). China's post-WTO technology policy: Standards, software, and the changing nature of techno-nationalism. Washington, DC (The National Bureau of Asian Research), NBR Special Report, No. 7.
- Timmers P. 1998. Business Models for Electronic Markets. Journal on Electronic Markets 8(2): 3-8.
- Whinston Michael D., Exclusivity and Tying in US v Microsoft: What we Know, and Don't Know, The Journal of Economic Perspectives, Vol. 15, No.2 (spring, 2001), pp. 63-80
- Wikipedia. (2014). TRIPS and Software. Retrieved from www.wikipedia.com on 18 January 2014.