

Determining the Price of Software Products in Software Manufacturing Firms in Vietnam

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Abstract

From the early 2000s to the present, Vietnam has made efforts to facilitate the development of information technology industry and to promote the growth of it market in general and software in particular. Many policies and measures to encourage the development of software firms have been issued by the government. However, despite enjoying favorable conditions from the State's support policy, software firms still face many difficulties in product consumption. In addition to illegally copying software and copyrighted software that have been severely damaged, causing great harm to manufacturers, there are also situations where products are not sold with the right value. Currently, in Vietnam there is not yet a method of calculation, as well as a complete unified accounting for the determination of software product price, each firm follows its experience. Based on data collected, both primary and secondary, we synthesize, evaluate, compare and analyze the research topic. The results show that the determination of software product price at software manufacturing firms is not very reasonable; the recognition and allocation of core software value has not been proper. So based on the findings, some recommendations are given for improving the determination of product prices at software manufacturing firms in the context of developing countries like Vietnam.

Keywords: Software, core software, intangible fixed asset, license.

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1. Introduction

Software development is a major activity of software manufacturing firms. Software product is viewed as an innovative product and can be considered as both a tangible and intangible product. Software products are compact, easy to transport and copy. The life of the product depends on the development of science and technology. There are unmarketed products that are outdated. Therefore, the product's life cycle is considered as one of the determinants influencing its price valuation.

At the same time, according to the current reality in Vietnam, each firm has a software product associated with the name of the firm to create the brand of the firm. And that software product is considered as the core software of the software firm. The determination of core software price as well as its allocation to licenses (different versions of the software) in firms is very inconsistent and confusing and there are no specific guidelines from regulatory bodies in the context of Vietnam.

These characteristics of software products dominate the production and management of software industry and especially affect the determination of product prices at software manufacturing firms. That is why a research on determining the price of software products in software manufacturing firms in the context of Vietnam and emerging countries as well is too necessary in this case.

2. Case Studies of Software Manufacturing Firms

Nowadays, there are many different large and small firms producing software in Vietnam. But as software classification analysed above, in this study we collected data of three large and specialized software manufacturing firms in Vietnam as CMC Group Joint Stock Co., - Software Solution Co., Ltd. (CMC Soft); FPT Software Co., Ltd., and Hoang Ha Technology Joint Stock Firm. These are the first top three largest firms in software production in the market of Vietnam.

CMC Group Joint Stock Company - CMC Soft

CMC Soft is one of the leading software unit in Vietnam and their products mainly target in domestic market. CMC Soft produces software with high accepted and has some core softwares such as:

First, EDocman software. It is the product awarded as the gold medal of information technology of of Vietnam Computer Association in managing and customizing the work flows set up in an organization.

Second, iLib software - an integrated solution for library management, to meet the needs of domestic libraries, from public libraries, libraries of specialized universities and libraries to Central Information center nationwide.

Third, IU University Management Software - a software developed to support staff to handle work in training management at universities, colleges, vocational schools for improving operational efficiency as well as support students, lecturers, and leaders in exploiting information.

Together with core software mentioned above, CMC Soft develops software packages and these products according to customers' requirements distributes.

FPT Software Co., Ltd. - belongs to FPT Corporation

FPT Software Company is an enterprise mainly producing software for clients from abroad. FPT Software (referred to as "FPT soft") is a one member limited liability firm established in Vietnam. They produce software under requirements of foreign customers. Since FPT's customers are mainly from abroad, around the world, the company has offices in these countries to receive orders and develop software at the request of customers.

Hoang Ha Technology Joint Stock Company

Hoang Ha is a manufacturer of bulk packaging software, which doesn't follow up customer requirements. Hoang Ha Company only produces one type of software which is the estimation software called G8. The company has G8 products packaged at different prices with different features to meet the different requirements in estimation of construction firms.

Due to the specific characteristics of software products as well as the characteristics of software product manufacturers, the cost of producing software products is mainly the cost of salaries and salary-based deductions of technical and software programmers, because this is a creative and thinking product. Labor costs account for nearly 70% of the value of software products. Through survey results carried out at 60 software manufacturing firms in Vietnam in order to classify production costs, 71.67% of firms classifies and keeps business accounts according to expenditure factors and 28.33% of firms producing software classifies production costs according to the production process. To examine the situation of detailed tracking of production costs in software manufacturing firms, we raise the question of which production cost accounts are opened in detail under the following objects?

3. Results and Discussion

3.1. Determination of the subject to bear costs

The determination of accounting objects to collect production costs and calculate software product costs in each firm depends on the organization and production characteristics and technological processes of each firm. Through the survey results in software manufacturing firms, the software production firms can be divided into three groups as follows: (i) Firms manufacturing software on orders without basing on core softwares; (ii) Firms manufacturing softwares on orders basing on core software; (iii) Firms manufacturing mass products basing on core softwares.

(i) The object gathers production costs

Actual research in software production firms, who gather production costs in software production firms mainly used to calculate the cost of each software product or each order.

With the question "How does your firm collect costs?", We obtained the following results from software production firms as below:

Per stage (software production process)	17/60
By order	25/60
According to each type of product	18/60
Other object (please specify)	0/60

- For software production firms on order basis and firms producing bulk packaged software but based on core software products, production costs are gathered and determined as below:

+ Research and deployment phase: Costs in this period are directly gathered for core products of firms.

+ Software development phase: Costs in this period are gathered directly for each order or directly gathered for each type of mass production product.

- For software production firms on orders not based on core software products:

+ Research and deployment phase: Costs in this period will be gathered directly for each order.

+ Software construction phase: Costs in this period are gathered directly for each order.

Thus, the object of gathering production costs in software firms is different depending on the type of business and depending on how these software products are produced. Thereby leading to accounting in the software production firms are also different.

(ii) Subject to calculate product cost

Determining the subject to calculate the cost price is necessary to calculate the cost price of accounting. Calculating software product prices must be based on the production and business characteristics of software manufacturing firms, characteristics of each type of software product that the firm produces, the nature of production and product distribution in order to identify the subject to calculate price. The subject for calculating the cost of software production firms is the completed software product (18/60 firms) and the individual order (42/60 firms).

Specifically, subjects of software product cost calculation in software firms are individual orders for those which manufacturing software by order or core software or any kinds of software package. Subjects that calculate this cost will be determined differently at each software production stage. For final finished products, the subject should be in order of the firms which produce software by orders. For those which provide massive software packages, the subject individual product of the package. The object calculating cost is each packaged software product.

3.2. Methods of determining costs for objects is the cost of software manufacturing firms

Different software manufacturing firms apply different methods of determining the price for the subject of charge. The survey results of the application of the cost calculation method in software manufacturing firms in Vietnam show that (i) software manufacturing firms use simple methods (18/60 votes); (ii) firms producing according to orders are using the method of calculating the price according to the order method (25/60 votes); (iii) method of calculating the total cost of the charge (17/60 votes). However, due to the specificity of software products that are not mass-produced products, each software product used for a certain purpose. For example, accounting software is only used for book recording and accounting, library software is only used for management in the library. Therefore, the calculation of cost according to software products or orders is equal, and each order is equivalent to 1 software product.

a) Determine the price of software products ordered by production based on core software

Software manufacturing firms of this group will have to determine the cost of manufacturing core software products and determine the price of software products on order.

(i) Determine the price of core software products

Determining the price of core software products will include all costs incurred in relation to product manufacturing at the research and deployment stage.

- Research and deployment phase: Costs incurred during the research phase in software manufacturing firms are mainly labor costs (salaries and its deductions based on the salaries of technical research workers plus with wages paid to consultants). There are also other costs incurred such as the cost of outsourcing services and cost in cash value. These costs will be gathered directly for each core software product.

The research phase is the period when firms don't make decision whether the products are put into use or not. If, after the research phase, it is found that the production of this software is not feasible and not suitable in term of technology and reality, the enterprise will not implement this software. In contrast, after the end of the research period, administrators realize that the production of this software is feasible and suitable with modern technology and it can be fully used by customers, then technical staffs and experts can start their software development phase. Technical staff in conjunction with experts to conduct (produce) software.

The cost of the deployment phase is also mainly the wages and salary expenses and salary deductions from software developers. At the same time, there are other costs such as computer depreciation expenses, USB costs, floppy disks, technical desks and chairs, etc. All these costs will be gathered and allocated to each core software product.

After producing core software products, their cost depend on the product value and the firms will have different method to record price.

+ According to the survey results of the authors, 75% of software manufacturing firms recorded the cost of producing core software products as a high value expense in order to gradually allocate for any mass-produced items in the future.

+ 25% of software manufacturing firms record core software products as an intangible fixed asset in firms.

CMC Soft has produced Edocman software and registered copyright. Edocman software is eligible to record intangible fixed assets and is monitored in debit account - Intangible fixed assets (CMC Internet) with a value of 2,540,000,000 dong of Vietnam (VND). The company conducts depreciation deduction including the cost of EDOCMAN products is 2,540,000,000 VND, the estimated consumption volume is 576 licenses, corresponding to the value of 4,409,722 VND/license. If only 100 licenses are sold in the year, the software depreciation cost will be recognized in the cost of selling these licenses.

(ii) Determine the price of software products produced by orders based on core software

Firms that produce goods according to orders, the objects that collect costs and subjects that calculate the cost are each order. For orders that have not been completed by the end of the accounting period, all production costs gathered under that order are considered to be the value of the unfinished products at the end of the period to be

transferred to the following period for until the completion of the order.

For enterprise making software on order basing on core products, the price of orders will be determined during the software construction phase including:

- The entire cost of salaries, deductions from the salary of the technical staff in charge of order making is gathered directly for each order.

Extracting data from CMC Software Solution (CMC Soft) is as follows: Mr Ha Duc Thanh - from product development team. In December 2017, the rate of execution time for the project (case code) 'iLib.Support2017' is 25%, other project codes are 75%. The salaries of December salaries are VND 24,516,000, the salary expense allocated for the code 'iLib.Support2017' = 24,516,000 VND x 0.25 = 6,129,000 VND.

- Software products are made by orders without basing on core products. According to the survey results, currently 100% of software manufacturing firms of this group allocate core software value for orders according to estimated consumption time.

In addition to the main cost of labor costs and the cost of core software allocation, this period also incurred the cost of tools, computer depreciation costs.

b) For software products produced by orders but not based on core software

Firms in this group manufacture software by orders from customers without basing on their core products but it depends on customers' requirement. Costs incurred for production of this type of software are directly gathered by each order or by the name of each customer or the name of each product, because each order is equivalent to one product. The cost of each order is determined by the total cost method and is also determined in stages. Specifically:

- Research and deployment stage: Research and development stage costs include salaries, deductions according to the salaries of technical staff, salaries of technical consultants, other expenses incurred for order research and study.... Is gathered directly for each order.

After research period, if the development of order is not feasible, the expense for this period will be recognized as the incurred expense.

- Development phase: Since this is a product written on the order, the costs incurred during the construction phase are directly gathered for each order, including (i) the cost of salaries and deductions according to the salary of technical staff writing software; (ii) computer depreciation expense of software developers.

The entire cost of salary after being determined will be recorded as the cost of software production for each order. Other costs such as travel expenses, office rental costs, computer allocation costs, server rental costs, etc. are also recorded and tracked in detail for each order.

c) Packaged software manufacturing firms

Packaged software products are software products designed by firms and sold in bulk as normal goods. Packaged software products are characterized by inflexible, their modules are designed according to the intention and ideas of the developers (suppliers), the users only follow the instructions of the supplier.

Packaged software products are products cloned from the core software of the enterprise (also called licenses). Packaged software retains all features of the core software and is not modified according to customer requirements. From the core products, the developers can make other packaged software with different versions in the form of packaging due to the limitation of core software features in different versions. There are different types of packaging products available. Taking the G8 product as an example, there are many different versions: G8 Amateur estimation product, G8 Beginner estimation, G8 Professional estimation, G8 Firm estimation, G8 settlement. In fact, there are two ways to produce packaged software products.

+ From software core software firms will produce (duplicated) by the number of bulk packaging products called licenses. These licenses have the same functionality as core software.

+ From the core software, the enterprise will manufacture a series of different software (or mass product software). Each kind of these software is limited by specific features or some feature are improved better than the core software. And from these different types of software, businesses will continue to replicate into packaged licenses. Therefore, according to the total cost method, only the price of each type of product can be determined. As for the cost of each license, it is determined by allocating the common value to all licenses for production in the period divided by the estimated time (product life cycle).

d) Determine the cost of work in progress

Before calculating the cost of products, they need to assess to review unfinished products. Due to the characteristics of software products, it depends on how to determine the period of product cost to determine whether or not the work is in progress.

According to the survey results, 10/60 surveyed firms (accounting for 16.67%) have conducted a review of unfinished products. Software manufacturing firms conducting reviews of uncompleted products are usually those who accept big orders with high value in a one- year period. For firms making packaged software or producing software on orders with low value in a period less than 1 year. They do not carry out the assessment of unfinished products at the end of the period because of the total production cost and product prices are defined during that

period.

With the characteristics of software production on order with the value of large orders, the implementation time is more than 1 year, so the software manufacturing firms must determine the annual turnover to account revenue in accordance with period (including unpaid invoices) and to collect money from customers for the software development in the next phase. Therefore, the value of completion to determine revenue will be based on estimating the work rate of the software development department. The rest will be included in the value of work in progress.

Extracted data from FPT Soft Software: FPT Soft specializes in manufacturing software on orders for countries such as Japan, Malaysia, Australasia, USA. Those order are characterized by high value and over 1 year of implementation, therefore, it is necessary to determine the payment value based on estimated revenue, thereby determining the value of work in progress.

Thus, the software manufacturing firms all determine the product price according to the actual cost and determine the product cost according to the total cost method. Under this method, the cost of production products is the actual costs incurred and the product price will cover all the costs incurred in relation to the production of the product. The determination of such product prices has served the valuation of inventories well and determined results in accordance with the financial accounting. However, the determination of the price on core products in these firms has not really been taken into consideration in the right way and carried out synchronously. Basically, software manufacturing firms do not have the concept of core software, so the costs incurred related to core software production are recognized as expenditure in the development phase or prepaid cost then the cost will be added gradually into the next accounting period according to the estimated time.

4. Recommendations Raised

4.1. Conditions to record the value of core software products are intangible fixed assets

Currently, software firms are not yet consistent in recording the value of core software products as intangible fixed assets of firms. Only 25% of firms have recorded the core software value as an intangible fixed asset. However, this recognition does not follow a specific rule or regulation, especially with core software products formed during the research and deployment phase. For core software products after the research and development phase but not completed due to some reasons, the total costs should be recorded in cost of goods sold in the period instead of recorded into management costs.

At the same time, according to the regulations in Vietnamese accounting standards (Standard No. 04 - Intangible fixed assets) and a circular guiding the identification of intangible fixed assets (Circular No. 45/2013/TT-BTC) has not enough information to guide software manufacturing firms in Vietnam to have grounds to assess and record core software products as intangible fixed assets. Therefore, if the core software products meet the following five requirements, simultaneously, the firms should record these products as intangible fixed asset as (i) Software products must be copyrighted to prove the control of the property of the enterprise; (ii) The software product must generate economic benefits in the future (this is reflected in the technical feasibility of the software, ensuring that software products are put into use or intended to sell); (iii) The value of the software is determined reliably (capable of securely determining the entire cost during the research and deployment phase to create that software product); (iv) Duration of use (usefulness) of software over 1 year; (v) Software products are qualified in terms of value according to current regulations (according to current regulations on fixed assets, the value must be VND 30,000,000 (thirty million dong) or more.

With core software products completed after the research and deployment phase but not satisfying one of the 5 conditions of being recognized as an intangible fixed asset (for example: copyright not registered), the enterprise Software continues to monitor on account - prepaid costs. The core software value will be allocated to each series of products or each order will be based on the estimated life of the product (i.e. an estimated time allocation).

For core software products of great value, which satisfy five above conditions, core software is recorded as an intangible fixed asset.

4.2. Implementing the method of distributing value of core software products

When core software products are recognized as intangible fixed assets, firms should depreciate and allocate core software depreciation values for each type of software product or each order according to the specific allocation. Currently, software manufacturers extract depreciation with software products that qualify for intangible fixed assets according to the estimated output. However, if no software is sold during the year, it is not depreciated. In the author's opinion, for software products recorded as an intangible fixed asset, firms should depreciate and record the cost of goods sold or not sold during the period. . Firms can apply either of the following depreciation methods or can apply both depreciation methods simultaneously. That is depreciation based on estimated consumption and depreciation based on estimated time.

Method 1: Allocating software costs is capitalized according to the estimated output

The allocation according to the estimated output for the replication software follows the following formula:

The cost allocation by estimated output for replicated software (licenses) is as calculated as follows:

Licenses = (Core software value / Estimated output) x Actual consumption amount

As for firms with core software products that are not eligible for recognition of intangible fixed assets, the value of core software is also monitored on the Account - Prepaid expenses and also allocated to licenses according to the above formula.

However, with the way of allocating costs for licenses according to the estimated output, each year the company must re-estimate the estimated output to suit the reality. At a certain stage, these appears errors related to technology and software are no longer applicable, then the cost of allocating core software for licenses corresponding to the actual consumption in the period will be recorded into the detailed cost of each order, each license. The remaining unallocated expenses will be included in the general cost price during the period.

The distribution according to the estimated output will be as follows:

- Suppose the enterprise produces 1 X core software worth 5,000,000,000 VND. The initial estimated consumption of software X is 50,000 licenses.

+1st year actual consumption volume of 10,000 licenses. Then allocate core software costs for licenses by:

Cost of first year = $(5,000,000,000/50,000) \times 10,000 = 1,000,000,000$ VND

+2nd year, due to technological changes, the enterprise will estimate the consumption volume will not be 50,000 licenses but 30,000 licenses. Actual consumption volume in second year is 5,000 licenses. The allocation cost for actual consumption volume in year 2 is as follows:

Cost of 2nd year = $(\text{VND } 4,000,000,000,000,000) \times 5,000 = 666,666,667$ VND

+3rd year, due to changes in technology, firms will re-estimate the expected consumption volume of 10,000 licenses at this time. Actual consumption volume in third is 6,000 licenses. And after consuming 6,000 licenses, the core software no longer has a viable application. At this time, the allocation cost for actual consumption in year 3 is as follows:

Cost of goods in third year = $(3,333,333,333/10,000) \times 6,000 = 1,999,999,999$ VND

The remaining value of core software is:

$5,000,000,000 - 666,666,667 - \text{VND } 1,999,999,999 = \text{VND } 2,333,333,334$ will be recorded into the overall cost of the enterprise.

Method 2: Allocate software costs capitalized for medium licenses that apply according to consumption and estimated time

If during the year, the actual consumption is less than the estimated consumption, the depreciation value is recorded in the cost of depreciation under the depreciation method. If the actual consumption volume is larger than the estimated consumption volume, the depreciation value will be recorded according to the actual output.

For EDOCMAN software is developed by CMC Soft with the value of: 2,540,000,000 VND, estimated consumption volume of 576 licenses, 144 licenses / year, equivalent to 4,409,722 VND/license, the estimated time is 4 years. If 100 license is sold in a year, the value of 100 license will be credited to the unfinished production and business cost during the period; The remaining 44 license will be recorded as cost.

Value of 100 license: $100,000 \times 4,409,722 = 440,972,200$ VND (detailed under licenses)

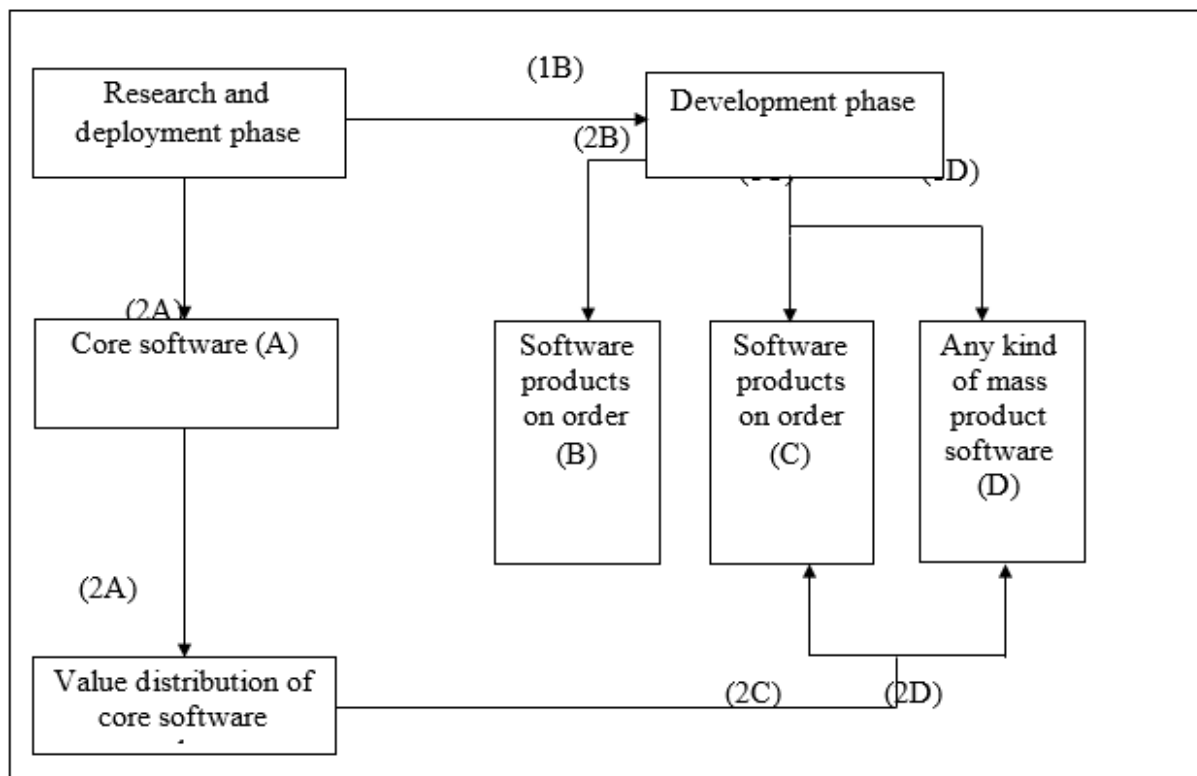
Value of 44 license: $44,000 \times 4,409,722 = 194.027,800$ VND

If 150,000 license is sold in the year, the value of 150,000 license will be recorded in the unfinished production and business cost during the period.

Value of 150,000 license: $150,000 \times 4,409,722 = 661,458,300$ VND

Thus, in the opinion of the authors, it is possible to generalize the process of determining the price charge for the fee-bearing objects in software production firms through the following diagram:

Diagram 1: Diagram of determining charge rates for charge-bearing objects in software production firms



In which:

(1A): Gather direct costs for core software products

(2A): After gathering the core software value, allocate the core product value

(1B), (2B): Gather software production costs according to each order (orders produced are not based on core software).

(1C), (2C): Gather software production costs according to each order (orders are based on core software).

(1D), (2D): Collect production costs for every mass product software.

In short, accounting of production costs and product prices in general and determining software product prices in particular is an issue that has always been of interest to software manufacturers. Determining the product price helps the firms to identify the selling price correctly, because this directly affects the profit and production and business efficiency of firms. In the context of the market economy with the regulation of the State as at present, firms must assert themselves and stand firm in the extremely fierce competition environment, the determination of the price of software products again become more necessary and more important. Finding a method to determine product price is always the goal of business managers of software production. In order to achieve this goal, besides the efforts made by the software manufacturers, these need the support from the State who will build and issue specific regulations for the software industry.

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