

Valuation Of Software Based Trade Secrets

Part 5: TSV (ICS)

By Dwight Olson

Wikipedia defines computer software as “anything but hardware, meaning that the “hard” are the parts that are tangible while the “soft” parts are the intangible objects inside the computer. Software encompasses an extremely wide array of products and technologies... Software is [also] involved in video games and the logic systems of modern consumer devices such as automobiles, televisions, and toasters.”¹ With such diversity how can one ever begin to understand software value? Thus, Total Software Values (TSV)² came into existence.

Any proprietary technology that confers to its owner competitive advantage relative to its competitor is generally recognized as a valuable technology intangible³ and this is especially true for software. There are numerous reasons to conduct a valuation of a software based technology and in using Total Software Value (TSV) there are three primary but different value contexts⁴ that are highly appropriate to consider for all software. These three different analyses are used to value the different contexts of software owned by an entity. The three contexts provide insight into: *software inventory (OV)*,⁵ *transaction (MV)*,⁶ and *trade secret Internal Cost Saving (ICS)* values. In TSV, these three different value contexts are independent of each other. Consideration by the software owner of these distinct contexts helps with insight into governance, investment, sale, exclusive licensing, licensing royalty management and apportionment. Consideration of these contexts helps the stockholder or investor with transparency into the software assets owned by the company.

Part 5 Focuses On Trade Secrets

This is the fifth article in a series on TSV soft-

ware valuations. In this article, we explore the third software context for software, namely value analysis of software based trade secrets. The opportunity or need to value a trade secret is quite common when an organization decides to not patent a software based invention, but rather to harness the invention exclusively within the organization. This may also be the case when an entity decides to develop computer software internally to automate certain processes within the entity for cost savings instead of license-in and customize. The valuation analysis using TSV for trade secrets has two parts, the software inventory value analysis and the trade secret use value analysis. At first read, one could consider TSV(ICS) confusing or badly named for this trade secret context, however this context was initially called TSV(ICS) for the Internal Cost Savings or revenue potential that could be generated by the trade secret. For example, did the internal development, commercialization and use of the trade secret generate software asset value, cost savings or revenue or both?

TSV(ICS) For Trade Secrets In Internal Software

The TSV(ICS) valuation context was specifically developed by Data Securities International, Inc.⁷ for owners of software based trade secrets to understand the value propositions of their trade secrets in their custom software.⁸ Custom software is generally defined as any software that is developed and or modified for some purpose. Software that is licensed-in and then modified or customized is not the focus of this article for it violates the TSV value

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1. http://en.wikipedia.org/wiki/Computer_software; Overview.
2. Software and Valuation in the Information Society, *les Nouvelles*, June 2008.
3. Valuing Intangible Assets, Robert F. Reilly and Robert P. Schweihs, McGraw-Hill 1999.
4. Or framework; A set of assumptions, concepts, values, and practices that constitutes a way of viewing reality.
5. Part 3–The Software Inventory Valuation TSV(OV).
6. Part 4–The Software Inventory Valuation TSV(MV).

7. http://en.wikipedia.org/wiki/Data_Securities_International.
8. Custom software is computer software that is specially designed for a single person's or a small group of persons' specific needs. Custom software includes modifications to canned software and can be developed in-house by the user, by outside developers, or by both. Washington Administrative Code WAC 458-12-251.

generating principle of ownership.⁹ The focus of this article is on software developed by the entity, for the entity and ownership is vested in the entity. This is not to say that software that has been licensed in and modified is not of value to the organization. It may be put to very valuable use.

As mentioned, in TSV, software based trade secrets have both a value in the software inventory as the capital asset¹⁰ and an internal cost savings or revenue value in the use of the trade secret. The TSV(ICS) analysis attempts to deal with the complexity of the value proposition of the trade secret. The TSV(ICS) value is considered to be the revenue derived or cost saved in the use of the trade secret and the TSV(OV) value is considered to be the asset value of the software inventory components. One could consider this similar to a software process patent where the market value is the net present value of the patent and then the commercialization process builds additional value in the software inventory of the patent.

Custom software value may be least understood outside the entity, but undoubtedly has an enormous impact¹¹ to the entity. In valuation of software what is the context? Is the question: what did the entity pay to build the software? Or, is the question: what would it take for the competition to build the software and how long? Typically, software valuations use the cost method. Typically in this cost method the analyst uses historical expenses to cost value the custom software. This process can yield good valuations when the historical data was accurately captured as true expenses for the software. But, if the historical expenses were not accurately captured or may be unreasonable, then this could yield questionable valuations. A TSV based valuation identifies each software inventory component and then gives to management or the investor what the experts say is the reasonable cost value to recreate the software inventory component. Software valuations that use projections other than historical data may have more transparency for investors and stockholders.

Identification, Possession And Ownership

Central to a TSV(ICS) valuation are the same TSV value generating principles of *identification, posses-*

sion, and ownership. If *identification, possession, and ownership* are key to a TSV trade secret value, then some additional background on trade secrets might be quite helpful for the reader. For example, from the article “The Economic Valuation of Trade Secret Assets,”¹² a discussion of the legal aspects of trade secrets was quite important in the application of valuation principles.

“A trade secret can only be validated in litigation. Until there is a judgment entered in a civil lawsuit that the Plaintiff possesses a trade secret, there is no legal trade secret status. In contrast, there is a presumption of validity when patent, copyright and trademark certificates are issued by the United States government. An official certificate defines the specific intellectual property right that exists.

Trade secrets, however, remain inchoate and subject to the vagaries of the litigation process. The burden of proof is on the trade secret owner to show the existence of a trade secret as Plaintiff in a misappropriation lawsuit. The Plaintiff cannot rely on presumptions flowing from a prior *ex parte* examination by the federal government.

There are four proofs required to prevail on an assertion of trade secret protected status in court:

- Existence. The information must qualify as a trade secret asset.
- Ownership. The plaintiff must be able to prove ownership of the information.
- Access. The plaintiff must prove the defendant had access to the information, that is, that the defendant did not independently re-invent the trade secret.
- Notice. There must be actual, implied or constructive notice of the trade secret status of the information prior to the misappropriation.

Failure of any of these four essential proofs puts the trade secret assets at risk.”¹³

What is a trade secret? A widely relied-upon definition of a trade secret is a “trade secret may consist of any formula, pattern, device or compilation of information which is used in one’s business, and which gives an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a

9. See Software and Valuation in the Information Society, Part 4, September 2009.

10. In financial economics, it refers to any asset used to make money, as opposed to assets used for personal enjoyment or consumption. See http://en.wikipedia.org/wiki/Capital_asset.

11. The Economic Valuation of Trade Secret Assets, R. Mark Halligan, Esq., Richard F. Weyand.

12. *ibid.*

13. *ibid.*

list of customers.”¹⁴ A trade secret is usually distinguished from a patent either because: it consists of something that cannot be patented; it consists of something in the process of being patented (and still secret); or a decision was made that keeping the product or process as a trade secret was more beneficial to keep secret than seek a patent.

In order to claim the benefits of trade secrets as intellectual property or in the event of stolen trade secrets, trade secret owners must have an estimated value for the trade secret to assess value or damages for civil liability or criminal prosecution. One of the following three methods (from the U.S. Department of Justice’s Task Force on Intellectual Property in their Progress Report of the Department of Justice’s Task Force on Intellectual Property) may be used to find an estimated value. Cost to Develop the Trade Secret; Cost of Acquisition; or Fair Market Value if sold.

The understanding of the legal aspects and how they may impact any valuation is quite important as just noted. The items in Table 1 identify the software inventory components usually associated with “internally commercialized” custom software for trade secrets. These items help give identity to the trade secret software components that are owned by the entity, and all should be considered proprietary, valuable, and managed as trade secrets. When done, a better understanding of what Karl Jorda hints to in his comment, “Patents are but the tips of icebergs in a sea of trade secrets.... patents have value and possibly more valuable are the background assets.”¹⁵ Let’s review the past four articles on TSV software

valuation as a basis for TSV(ICS).

Review The Past Four Articles On TSV Software Valuation As Background For TSV(ICS)

Part 1¹⁶ introduced the concept of Total Software Value (TSV) that was developed by Data Securities International in the mid 1980s to value software for corporate governance, debt financing, and stockholder considerations. In the mid 1980s many software based companies had a difficult time explaining to stockholders the value of the software owned by the company. In the evolving digital world, the non-transparency of software value for an investor is largely still true today. Accurately identifying, analyzing, and evaluating software by and within an enterprise, continue to be important and ever more critical to valuation as the government regulations, such as Sarbanes-Oxley and Federal Accounting Standards Board (FASB) 141/142, force effective valuation and careful governance of intellectual property including Software. There is a need for transparency of the value contexts of software. Governments want to be able to tax appropriately, stockholders want management to maximize value, and the financial world wants to have a more knowable investment in a digital company by understanding its assets.

Part 2¹⁷ introduced the TSV contexts of software; software inventory (Owner Value), transaction (Market Value), and trade secret (Internal Cost Savings) as value contexts with their influencing variables as the primary views of software as a financial asset. Part 2 also gave an introduction to the software inventory

components of a commercialized software product with a discussion that those software inventory components were identified as components usually needed to bring a software product to market. The article also highlighted some of the more critical issues of software as an asset and some software valuation principles at play today.

Table 1. Software–Internal Commercialized Asset Inventory

Employee as user support systems	R&D components
Installation and training	Internal design documentation
User documentation and help	Source code with comments
Appropriate databases	Source code control with comments
QA and testing	Databases
Bug/support system	Internal Commercialization
Testing code and data	3rd party software
Manufacturing system	QA and system software and tool base
Specific build guides	Executable systems
Strategy	IT support documents
Software enhancement plan	
Employee as user support systems	R&D components

14. Restatement of Torts, Section 757.

17. Part 2–The Software Inventory, *les Nouvelles*, December 2008.

15. The Differences between Patent and Trade Secret, Franklin Pierce Law School, Summer/Fall 2004.

16. Software Valuation in the Information Society, *les Nouvelles*, June 2008.

Part 3¹⁸ discussed the analysis for valuing the software inventory called TSV(OV) for ownership value. A TSV(OV) ownership analysis includes cost valuing all the components in the inventory, even if the valuation is for an open source product, for the ownership value of software is in the ownership of the software inventory just as in a proprietary software product. More on software inventory valuation below. Although open source is “free” it is still in nearly all cases “proprietary,” meaning that someone still owns the source code [software inventory component] and deserves credit for its development and subsequent uses¹⁹ and sale.²⁰ When using open source, companies can protect the value of close-source, trade secrets, patents, copyrights and their trademarks, by classifying open source (especially Free and Open Source Software, FOSS) into buckets or classes based on license restrictions.²¹

Part 4²² discussed valuing a software product for a possible transaction, be it sale, acquisition, or investment. For example, in valuing a software product for a market transaction, one or more of the three standard valuation methods of cost, market and income were discussed. Should the cost method be selected by the analyst, then the TSV(OV) cost value of the software inventory may be an appropriate base value to be used as a starting point for the transactional value. If selected, then, additional factors must and should be considered, such as profit or entrepreneurial multipliers that were not appropriate in the ownership cost value analysis but appropriate in a software product sales opportunity or exclusive use situation. If there are any significant marketing accomplishments, such as an existing licensee base, then use value of the licensee base should also be analyzed. However, for an investor, who is typically on the other side of the transaction, economic factors are of central concern, because the investor is concerned with a

return on investment. For the investor an income method valuation analysis is of primary concern, unless there are other business model forces at play, such as the software is in the open source community with millions of users and thousands of contributors to the open source software.²³

Valuing The Capital Asset (Software Inventory) Of The Trade Secret Using TSV(OV)

In valuing a software based trade secret using TSV, the TSV(OV) software inventory asset value²⁴ should be completed first then the TSV(ICS) analysis. TSV(OV) is the value analysis of the trade secret’s “software inventory” created during the research, development and internal commercialization of the idea, process, or method using computer based technology. This analysis can be done any time in the “internal commercialization phase,” but is most informative when the trade secret is in use. For example, if this is at first use, then we have a value context of the first version of the software inventory. Caution should be taken to only value those software inventory capital assets that have identity and exist in digital form. For example, if an inventory component is the reference document for use and exists on the internal Web site, the TSV value is in the cost to re-produce the digital document not the cost to maintain the Web site. The value emphasis is on the digital inventory, not the cost to house it.

TSV(OV) uses the costing model analysis, to analyze value of as many of the software inventory components as possible. A historical or typical cost can then be used to value any remaining inventory components, but any historical cost should be examined for reasonableness. TSV(OV) analysis considers the cost to recreate each component similar to the original software component. In the analysis to recreate the component, certain influencing factors should be examined to determine to what extent the recreated component might adjust the corresponding cost value of the original component. For example, if the new component is technically better than the original software component because it “contains” or is built with “newer” software technology, then this could impact the asset value of the inventory component. This factor is similar to the obsolescence factor discussed in many software valuations, but in TSV(OV) this factor is analyzed for software,

18. Part 3—The Software Inventory Valuation TSV(OV), *les Nouvelles*, June 2009.

19. Living with Open Source: Implementing, Managing, And Enforcing A Uniform Policy For Your Enterprise, *les Nouvelles*, September 2009.

20. January 16, 2008 Sun Microsystems, Inc. (NASDAQ: JAVA) today announced it has entered into a definitive agreement to acquire MySQL AB, an open source icon and developer of one of the world’s fastest growing open source databases for approximately \$1 billion in total consideration.

21. *ibid.*

22. Part 4—The Software Inventory Valuation TSV(MV), *les Nouvelles*, September 2009.

23. See footnote; Sun acquires MySQL.

24. Software Inventory Valuation Part 3—A TSV (OV), *les Nouvelles*, June 2009.

not the hardware upon which it lives. That is, methods used to depreciate tangibles as well as intangibles are based on the assumption that the goods being valued lose value over time. Such depreciation schedules are based on wear, the loss of value due to obsolescence, or changes in customer preferences.²⁵ However, well-maintained software, in active use, does not wear out, and is likely to gain value.²⁶

In the TSV(OV) analysis the valuation analyst should use an appropriate software engineering costing model such as SLIM, Checkpoint, PRICE-S, SEER, COCOMO²⁷ or Function Point Analysis²⁸ as a basis to calculate the anticipated cost to recreate inventory components such as the source code. The costing model will yield a reasonable indication of how long the experts say it will take in types of technical manpower and number of man months to recreate the component. The type of manpower and time can be multiplied using standard labor costs to yield a replacement cost value of the component. However, this may still not give appropriate credit to the trade secret's special components. Currently, all of the International Standards Organization (ISO) for costing methods such as for function point counting, measure the relative number or size of software functions, similarly to COCOMO's number of source code statements. For example in the function point counting method, the intermediate algorithmic transformations, translations and conversions of data types are not included in the measurement.²⁹ The reason given for not considering algorithms in the model is because there are no internationally accepted ways of defining or quantifying their complexity. However, in reality for most applications, complex algorithms only exist in a very small proportion of the software. A commonly accepted way to address the impact of the algorithms is to isolate the functional area and apply a different cost factor or analysis to those areas that have complexity. This possible imbalance may be corrected by additional costs of more senior consultants or experts.

However, the use of even more senior manpower may not be a total solution. In TSV, it is extremely important that the analyst give appropriate cost val-

ue credit to the research and internal design components. The expert analyst must be careful to value these special invention complexities.³⁰ These components will "house" the first embodiment of the invention or idea. In the analysis for ownership value, the expert analyst must take into account a reasonable research time required in order to prepare the internal or/and functional design documents. Caution should be done as these are extremely valuable documents and highly confidential as they are the valorization³¹ of the trade secret(s). It may take considerable expertise to determine the reproduction cost. If you remember from the software valuation article part 3, in TSV(OV) the cost value analysis is for a reasonable reproduction that does not mimic the component in analysis, but rather re-invents the component using different experts than the original inventors.

In TSV software valuation for software based trade secrets, the software inventory is "the result of commercialization," the capital assets of an idea or invention and may be quite appropriate as the apportionment value in transfers of soft assets within an entity as well as the capital asset component part of the apportionment value in mergers and acquisitions. The TSV(OV) inventory cost analysis should be considered separate from any "market" or transaction value considerations. Many software inventory components may be re-used in other products or in other products delivery and subsequent use, such as the digital rights management components. This potential re-use property of a software inventory component can be very valuable to a software business. This feature is very important in software governance as it provides additional software asset value to the component. One could consider this as similar to a valuation of a patent in a particular market or product niche, but such valuation may not contemplate the patents value in a totally different market or patent portfolio management situation.

Now Some Words On The Trade Secret "Use Value" Or TSV(ICS)

If TSV(ICS) is the context view of value for the

25. What Is Your Software Worth?, Gio Wiederhold, Communications Of The ACM, September 2006.

26. Spolsky, J. Joel on Software. Apress, 2004.

27. Software Development Cost Estimation Approaches—A Survey, Barry Boehm, Chris Abts University, Sunita Chulani IBM Research.

28. http://en.wikipedia.org/wiki/Function_point.

29. *ibid*.

30. Complexity can be interpreted into four categories: problem complexity, algorithmic complexity, structural complexity and cognitive complexity. *Information Technology Journal*, Volume 7, 2008.

31. In modern translations of Marx's economic writings, the term valorization (as in French) is preferred because it is recognized that it denotes a highly specific economic concept. It refers both to the process whereby a capital value is conferred or bestowed on something, and to the increase in the value of a capital asset. See <http://en.wikipedia.org/wiki/Valorisation>.

use of the trade secret, then how might use be valued and then applied? The use value context might be appropriate to begin to answer investment or acquisition questions. That is, upon completion of the cost value analysis of the software inventory for the trade secret, “What are the value propositions of the trade secret apart from the cost value?” Many intellectual property transactional valuations use the net present value income method to value a technology that is generating revenue or saving costs, this is also true for trade secrets.

If the trade secret is generating revenue or saving costs, then valuation can be done using the standard income method of valuation to derive an appropriate value proposition for use of the trade secret. Why is the income method selected over the market method? The market method assumes that if a comparable property has fetched a specific price then the property in question would fetch a price, similar to it. If it is difficult to find a comparable for a patent or trademark, it will be even harder to find a comparable for a trade secret. In using the income method, the analyst must determine the appropriate contribution for the trade secret in order to determine a net present value for a trade secret investment. Here the contribution could be the historical or anticipated difference in revenue income with the trade secret vs. without the trade secret.

In net present value analysis, the income method adopts a forward-looking perspective, estimating future earnings that can be derived from the use of the trade secret. Currently, different companies and valuations apply different definitions and projections regarding “revenue forecasting” with most forecasting based upon the present value of the expected income to be earned from the technology “trade

secret” in the economic model. As a consequence of this diversity, the income-based valuation model differs, in practice, from company to company. One might consider for trade secret valuations when using the income method, that the remaining useful live (RUL)³² from the TSV(OV) software inventory analysis could be quite useful in helping determine an appropriate projection period. For example, if the RUL factor is low, that is the current software inventory is quite limited in technical transportability,³³ then the projection period should reflect a more limited period.

In Part 3 on software valuation of a software product with patents using TSV(OV), the article discussed the idea that a product’s software inventory asset value could be considered additive to a software product patent’s value proposition in certain situations. The example given in the article used a patent’s present value formula, in this case a “rule of thumb” patent value formula, proposed in a 1999 LES article by Bob Bramson³⁴ where the TSV(OV) value could be added back to the patent’s value as component of the commercialization effort. Likewise for a trade secrets TSV(ICS) value, the trade secrets TSV(OV) could also be considered additive to the trade secrets TSV(ICS) value.

A goal for us software based intellectual property professionals should be to help identify and value software based proprietary technology that confers competitive advantage. Such a goal will give management insight into governance, investment, sale, exclusive licensing, licensing royalty management and apportionment. Such a goal will also give stockholders and investors transparency into the software assets owned by the company. ■

32. See Part 4 Software Valuation – TSV(MV).

33. See http://en.wikipedia.org/wiki/Abstraction_layer and Part 4–Software Valuation –TSV(MV), *les Nouvelles* September 2009.

34. Rules of Thumb: Valuing Patents and Technologies, *les Nouvelles*, December 1999.