Research on Principle of IT Project Valuation

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Abstract. This article analyzes the IT project valuation mechanism, and proposes that the basis of IT project valuation is to assess its value and price. On the basis of that, it specifically explains the conception, composition and characteristic of the IT project value. The article also discusses the IT project price as well as the generation of its value and price.

1. Introduction
IT project valuation is the basis and the component of IT project management. IT project could be divided into two kinds, one of which is non-order IT project and the other is commissioned by specific owner, i.e. order IT project. From a valuation-principle point of view, the essential of non-order IT project valuation is to determine the contractor’s development cost, and its valuation principle is similar to the value-determination principle of ordinary industry product. However, for the order IT project, the valuation principle is more complicated and has essential differences with that of non-order IT project. Therefore, it is necessary to discuss the valuation principle of order IT project. The article analyzes the IT project valuation mechanism, and specifically explains the conception and characteristic of IT project value and price, also discusses the relationship and the generation process of IT project value and price.

2. Valuation mechanism of IT project
According to the value rules of political economy, merchandise value is the content and objective basis of price, while price is the representation of value. Merchandise price is mainly determined by its value, and fluctuation of the price level mainly depends on the change of value. On the condition that the level of technology and management remains stable, merchandise value has the characteristic of stability. Therefore, the foundation of IT project valuation is the determination of IT project value.¹¹

IT project value refers to the value of IT project’s final product, i.e. the value of corresponding IT project. The value and use-value of IT project are special. Comparing to ordinary industrial product, differences exist in IT project’s value constitution, creation and transfer. As the material vehicle of product of information technology industrialization, IT project is the concentrative and typical representation of transformation from modern high-technology to productivity. IT project value must be determined on basis of scientific labor-value theory. As the representatives of knowledge product and information product, the determination of IT product value possesses the characteristics of knowledge-economy era. IT project’s value and use value are closely connected to the knowledge-economy era. The important position and effect of knowledge information and technology are fully proved in the value of IT project. Valuation mechanism of the IT project is figured as follows.
According to valuation mechanism of IT project, the basis of IT project valuation is to determine the value and price of IT project. The value of IT project is depended on the level of information technology and management, which means that the value of IT project would not change until the technology and management change. As the level of technology and management maintains stable during a certain period, the IT project value relatively remains unchanged. Furthermore, the IT project price oscillates about the value. Therefore, the IT project could be correctly valuated as long as the value and price have been correctly determined.

3. IT Project Value

3.1 Concept of IT Project value
IT project value refers to the sum total of materialized labor and living labor condensed in IT project. Material chain resource (invested resource), such as production material and labor material, forms the base of IT project value, and is also the source from which the IT project deriving benefit. Constrained by the objective historical condition and technology level at that time, Marx did not take detailed study and elaboration on the mechanism that knowledge creates wealth and mental labor creates value, however, his ordinary merchandise value composition also adapts to the IT project.

3.2 Composition of IT project value
According to the concept of IT project value, it is composed of three parts: The first one is the labor material value \( (C) \) consumed and transferred into new product during the production; the second one is the value \( (V) \) created in necessary labor time (work for the laborer’s own); and the third one is the value \( (M) \) created in surplus labor time (work for the society). IT project value depends on two parts: the amount of work and the consumption of labor, material and machine needed by unit product, while has no relationship with the market price of labor, material and machine.
3.2.1 Consumption of labor, material and machine needed by unit product of IT project.
The consumption of labor, material and machine is closely connected to the technology and management level in certain times, which means the consumption of labor, material and machine needed by unit product of IT project remains stable until the technology and management level changes. Since sudden change would not occur on the technology and management level of specific IT project, the consumption of labor, material and machine is hardly to change. In this case, combined with specific condition of IT project (technology and method, etc.), the consumption of labor, material and machine could be accurately determined according to scientific quantum.

3.2.2 Amount of work to fulfill the IT project.
The amount of work is decided by factors as design depth and calculation principles. Looking through the IT project life cycle, if the planning is comparatively reasonable and the design achieves the compatible depth, the determination of work amount of IT project could be relatively accurate.

The IT project value could be determined along with the work amount and the consumption of labor, material and machine needed to finish the unit product of IT project. As the IT project value is the controllable factor in IT project valuation, control of the value factor from the source is needed in IT project valuation, which makes the object amount required in IT project more reasonable and accurate. From the above, an effective IT project valuation system should first accurately determine the IT project value.

3.3 Characteristics of IT project value

(1) More human labor, especially highly complicated mental labor, is condensed in IT project than ordinary project. In the implement process of IT project, accurate estimation of value is hard to be executed because of high-technology and high-complicated production process, as well as the lack of intuition of patented technology merchandise.

(2) The use-value of IT project is intangible and unpredictable. On one hand, the use-value of IT project is usually intangible. The final purpose of generation of IT project value is to binds development and application effect of information technology, other than realize tangible use-value. Therefore, there is no need to take the physical creation of medium as the specific target of IT project, but to realize availability of information technology. Intangible use-value, such as source code, digital application, network system and information service, etc., is specific representatives of IT project value on network spaces. Hence, the final result of IT project implementation contains tangible production as well as intangible software program or consulting service. The ratio of intangible software program or consulting service in IT project is high, which makes the use-value intangible. On the other hand, before the use of IT project, especially the intangible part of IT project, the owner is hard to estimate the utility, which makes the use-value of IT project unpredictable. [3-4]

(3) The creation of IT project value has the characteristics of continuity and discontinuity. On one hand, continuity means that IT project value is not created by one-time, but created in business processes from primary goods to manufacturers, then to market and finally to consumers. Each process, such as EM, packaging, assembling, maintenance, patching, updating and regeneration, could create new additional value. On the other hand, discontinuity refers to discontinuous states in value-creating process of IT project.

(4) The transfer speed of constant capital’s value in IT project value is more and more fast. In the era of knowledge and information economy, scientific and technological progress has accelerated the pace of product innovation and shorten upgrade cycle. In the construction of IT project, intangible assets, such as intellectual property and patents, play an important role, whose value transfers into IT project by one or more times. Assets loss could be divided into tangible loss (wear and tear of use) and intangible loss. Intangible loss includes value losses resulting from reduce of technological effectiveness and depreciation invalidity along with improvement of labor efficiency. With the scientific and technological advances, the rapid increase in labor productivity, technology development and renewal process, the valid life cycle for intellectual property and technology patents
becomes shorter and shorter, and the value of depreciation and intangible loss become larger and larger, and the proportion of intangible value in production material value (C) transferred into IT project becomes larger and larger. [4]

(5) The proportion of variable capital value in IT project value is growing. Workers consumes a certain amount of living material for the reproduction of labor force, which is labor value consumed by workers beside purchasing living material, that is, value workers created in labor time for their own (V). Laborers consumption material includes substance living material, mental consumption material and development material. As increasing of times and expenditure for learning, receiving information and training skills, the laborer’s self-development material increases, and proportion of development material cost in V is growing.

(6) In the past, value created by living labor is an important part of the surplus value M of IT project. On one hand, live labor engaged in the production of IT project creates new value, and directly realize the appreciation of variable capital; On the other hand, currently, the living labor takes very small part in surplus value or profit of IT project. This is because a considerable part of IT project surplus value is created in the process that former technology works on current living labor, and this work has a multiplier effect, or in the present value transfer of production material, technology labor takes “follow-up creation” effect on new value. [4-7]

(7) The value of IT project is highly time-sensitive and uncertain. IT project and the development of information technology are closely related, and highly time-sensitive. Due to the development of information technology, software and hardware technology develop very fast. Since any development of information technology has a certain life cycle, information technological development life cycle determines the effectiveness of IT project. The longer IT implementation of the project consumed, the smaller the IT project value would be, and the shorter the duration of use would be. At the same time, IT project value is created with a high degree of uncertainty, which includes the measure uncertainty of IT project value and the uncertainty of source. [8-11]

4. IT Project Price

4.1 Concept of IT project

The IT project price is the currency form of value, and oscillates about the value. It shows in two sides: one is that price is based on value and is the currency form of value; the other is that the price may deviates from the value. The sum price of IT project as the social commodity is equal to the sum value. However, in the real market economy, the price of a single IT project may not exactly accordant with its value; the third is that the price of IT project oscillates about the value. Although the price of IT project sometimes deviates from its value as affected by the changes of market supply and need, the basis of IT project price is still the value.

4.2 Composition of IT Project

According to the concepts of IT project value and price, IT project price oscillates about its value. IT project, as a commodity similar to others, has value and use value, so the exchange of IT project should be on the basis of equivalent value. The IT project price is consists three parts. One is the expenditure of material consumption, which is the currency form of the transfer value in production material. The other one is the expenditure of the labor rewards, which is the currency form of the value created for the laborer’s own. The third one is the profit, which is the currency form of value created by the laborer for the society.

To accurately determine IT project price, four kinds of work are required. First, accurately confirm IT project value, which means confirm work amount and the consumption of labor, material and machine needed by unit IT project. Second, know IT project’s movement character and the change in market supply and need, then fix the market price of labor, material and machine. Third, explore the difference of IT project production rate and the fluctuation in currency value. Finally, confirm the influence made by changes in relevant state policies.
The generalized IT project price covers production price and circulation price. Production price is the price of newly-built IT project. Circulation price is the price expressed in circulation after IT project completed or even used.

5. **Formation of IT Project Value and Price**

In the process of IT project valuation, unit price could be calculated by multiplying the consumption by market price of labor, material and machine. Unit price times work amount equals price of every item. IT project price could be obtained by sum up the item prices. As far as work amount, market price and consumption of labor, material and machine are concerned, work amount and consumption constitute IT project value, which is relative fixed. While market price oscillated with changes in macro-economy and market environment. For example, the raise of production material, changes in financing cost caused by changes in rate, and changes in unit price of labor cost, etc., these conditions are the elements relatively hard to control in IT project. Therefore, it should fully know about the market price at point and scientifically forecast the future market price when undertaking IT project valuation. Market price at point of valuation is relatively easy to be confirmed, while it’s more difficult to scientifically predict future market price. So forecast of future market price is the difficulty in valuation. IT projection valuation should meet the requirement that dynamically valuate the price elements of each stage in the IT project process.

![Diagram of IT Project Value and Price](image)

**Figure 2. Formation of IT Project Value and Price.**

As a consequence of above, the foundations of IT project valuation includes two parts. One is confirmation of the quantity of IT project investment (labor, material, machine, etc.). the other is market price of IT projection investment (labor, material, machine, etc.).

6. **Conclusion**

The principal of IT project valuation is the foundation to determine method, content and process, and to write documents.

The core of the IT project valuation principal is to determine the IT project value and price. IT project value is defined by information technology and management level. IT project price is the currency representation of IT project value, and price oscillates about the value. Therefore IT project value should be considered by the every first, and then we consider the movement character of IT project price.

IT project valuation depends on two sides. One is that valuate the IT project on the base of invested resource. The other is that adjust the real cost (labor, material, machine, etc.) in process with the changes of real market price at any time on the base of the law of value, relation in market supply and need, production difference, fluctuation in currency value, influence caused by changes of state policies, then properly adjust and confirm the IT project price.

IT project valuation has its particularity. One is that living labor takes a high percentage in the sum value of IT project. The other is that compared to valuation on materialized labor, valuation on living
labor is more special and more difficult, besides, the current valuation systems and methods are universally immature. Therefore, it is necessary to build relevant value system and methods.

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