Management of Public Procurement of Information System

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Abstract

Developed countries' national governments operates huge and complicated information systems in order for daily public services. In the United States, public officers can negotiate about procurement conditions in order to find not only the lowest price but also high quality. On the other hand, Japan, believed one of the developed countries, prohibits public officers from making negotiations when they procure any public materials and services. Today's information systems are complicated; it is always challenging to express what to be implemented. Therefore, less communication including negotiations causes lower satisfaction of users, more expensive prices, and longer delivery time. From this viewpoints, Japan's regulation controlling public procurement is not practical. Nevertheless, they do not plan to change the procedure shortly. This paper shows the reason that Japan's law set such a strict procurement rule and explore problems using system dynamics models.

1. Introduction

Information systems procurement in government (IT public procurement), as beginning a new development or updating of an existing system, has a wide variety. In particular, national government's information system is extremely large in size and complicated compared to private companies; both software and hardware are supposed to work not only at headquarters but also nationwide, and required lowest failure rates. Moreover, the systems' structures and operations need to obey the low and detailed guidelines.

This kind of challenging procurement must need consistently good communications between purchaser and vendors from an early stage of procurement. For example, the United States of America permits purchase officers a kind of negotiation about price and other conditions. Complex systems contain various functions, and functions are put in order of importance. Public officers in the USA can balance price and quality.

On the other hand, public procurement in Japan is quite different; their law requires

no negotiation" between purchaser and vendors. The reason is mainly to prevent stakeholders from making collusive relationship. Indeed, it used to be many cartels, and sometimes they were led by a purchaser itself. Therefore, Japan's law eliminates public officers' authority related to public procurement by introducing the Act concerning Elimination and Prevention of Involvement in Bid Rigging etc., in 2007 (Japan Fair Trade Commission, 2007).

Then, all conditions related to procurements need to be documented and published before bidding. Purchasers are encouraged to write more and more detailed specification. It was believed to make deals transparent, venders' risk lower, and public service more efficient.

However, the fact was not so successful. Originally, most public officers are not trained to deal with information systems development. Therefore, even if purchasers wrote detailed procurement documents, delivered products are sometimes unsatisfactory. Besides, detailed specification was sometimes unpractical or out-of-dated, budget is often big, and purchasers lack incentive to save money. Then, there are huge complicated and unsatisfactory systems. Even if budget is lowered, prospective vendors would not bid such deals because of high risk of projects. Then, some big projects' bidding failed. This means public operations' delay or stop.

IT public procurement suffer from the following typical difficulties or problems (Takahashi, 2014): failure to let vendors understand purchaser's wishes, collapse of project due to products' complexity, misunderstandings of budget and proposal, vendor lock-in, virtually limiting prospective bidders for bulk procurement, and unethical activities by vendors exploiting purchasers' technological weakness.

These problems, because it did not occur much in the procurement of non-IT-related goods, services nor civil engineering, it can be said unique problems in IT public procurement. It should be noted that with respect to IT procurement and operations in the country, the Board of Audit of Japan (2004) conducted a survey, and the Ministry of Internal Affairs and Communications (2007) shows the guidelines.

Although there are many unsuccessful public procurement cases, Japan's government is reluctant to change this situation. This paper shows that the problem is not a matter of each public officer's ethics nor ability but caused by problem structure, using system dynamics. Simulation result explains that encouraging purchasers to make detailed specifications is rather to make IT public procurement difficult.

2. Problem Structure in IT Public Procurement

In order to succeed in procuring information systems, purchasers are encouraged to make requirements clear and detailed, which cannot be misunderstood by prospective vendors. In an idealistic thought, full information can pull the best products without schedule overrun. If not so idealistic, better products would be expected.

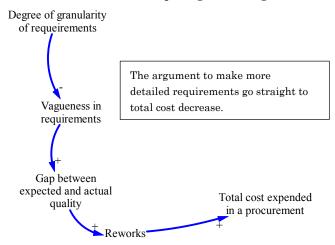This thought is illustrated as a causal loop diagram in figure 1.

Figure 1. Expectation that detailed description makes the best products.

However, related activities cause side effects. For example, detailed documentation needs additional time and money (overtime pay, research fee etc.). This relationship is shown in figure 2. The thick arrow is original thought expressed in figure 1. Side effects bring about increase of total cost expended in a procurement. This is an undesirable effect.
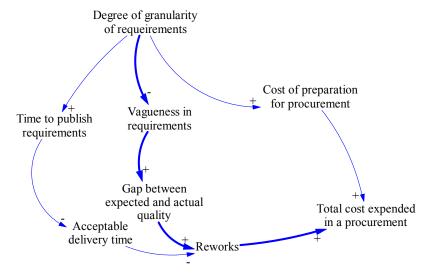

Figure 2. Side effects.

In particular, shortening delivery time is problematic. Shorter time to bid means prospective vendors have shorter time not only to make proposals but also to complete their system development and delivery. If the project failed, payment of a penalty for breach of contract would occur. Even if not paid the penalty, it is realistic to suppose increase in rework and maintenance costs due to a rough-and-ready business. Prospective vendors often shun these risks. In such a situation, no one bids the procurement bid and cause significant delay of public officers' tasks. Because of Japan's law, raising budget for such unsuccessful procurement is prohibited, public officers need to correct their plans significantly in order to succeed in the second bid. This makes public officers reluctant to increase granularity of requirements. This closes a loop in figure 3.
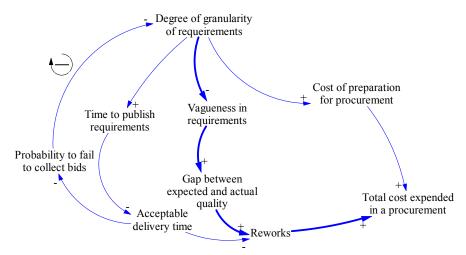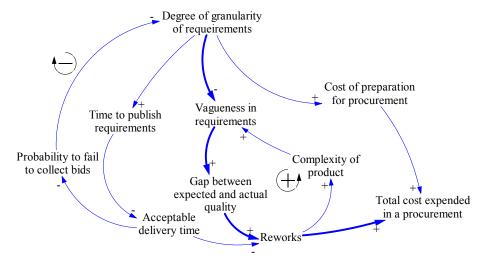

Figure 3. Appearing the possibility of failure in procurement

Failure of the system procurement of the Patent Office of Japan has been known as a big thing (Asakawa, 2012). The project over eight years, is obtained not leave only result in discontinuation. This is the person who created the specifications was transferred immediately before bidding, after which the specification changed to completely different from those at the time of bidding, the project has been extremely vague at that point. To restore the original purchasing officials for settling the situation, specification was also supposed to development back. But then that this staff was going to provide inappropriate information to bidders was supposed to leave the revelation to again project. This is an extreme example, but public officers tend to hope to settle all procurement as soon as possible. Thus, they must not fail the bid collecting contractors.

Rework in information system related tasks is not simply "do again." Rework makes product's structure complex. This also becomes a seed of other troubles. More reworks,

more additional management and hidden troubles. Figure 4 shows this effect, as a center feedback loop.

Cost affair is also making feedback loops. In the information business, it is often said that vague requirement raises project failure risks. CIO Magazine (2003) in exquisite creation of the RFP in the Ministry of Economy, Trade and Industry has been featured. Request it is possible to be scrutinized and documented in the ordering party, the party consciousness increases for the ordering party functions and operations. This, and the priorities of the functions implemented become clear, carefully and tested during the test or inspection of the trial, it can be expected to reduce the trouble after start of operation. On the other hand, as has also been mentioned in the same article, in the government of personnel rotation is in frequent, it is difficult to skill accumulation and take over, a large burden on the ordering party. Experience of the "summarizes a hard time" is, thus a connection tend to attitude that refuse to change the specifications made, there is a possibility that dismiss the appropriate vendor proposals. In addition, overly detailed specifications are able to narrow the width of the resulting proposed.

  Only positive effect on performance for fineness of specifications is often considered. However, it is understood that in practice there is a path effects applying a brake on it.

    Then, high costs bring about cost cut pressure via improvement the quality of requirement. This makes two additional feedback loops shown in figure 5.
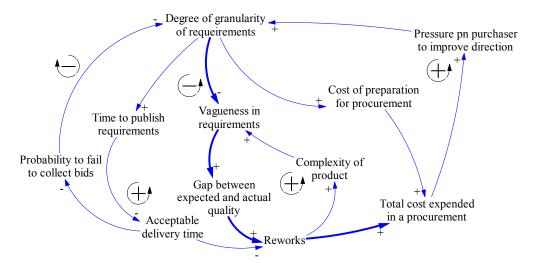
Figure 5. Cost-improvement in requirement link makes new feedback loops

Original causal relationship image in figure 1 was single route. However, we can find five feedback loops even limited around purchaser and vendors. Original intention to efficient work is not promised because of these multiple loop structure.

3. Simulations

Based on author's experience at one of committees in national ministry in Japan, each variable is set. Vensim model can be obtained from conference site (http://conference.systemdynamics.org). Base simulation gives parameters as followings: average time to bid is 12 weeks, vendor's system development should be in 48 weeks, and initial value of degree of granularity of requirement is 10,000. Simulation result is in the figure 6.
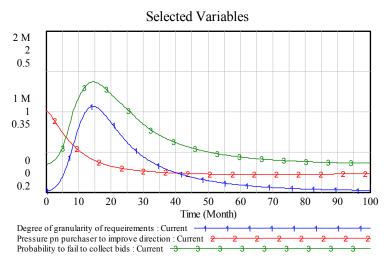
Figure 6. Base run result.

Figure 6 shows pressure on purchaser to make more detailed documents are gradually weakened, and the degree of granularity is once boomed but soon return back to original status.

If prospective vendors prefer more detailed description, say the twice of base run, the simulation result is in the figure 7.
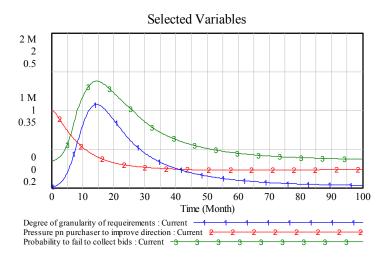

Figure 7. "Vendor prefers more detailed requirement" scenario

The result shown in the figure 7 looks similar to base run in the figure 6. In this point, we can see that prospective vendors' attitude have limited effect.

4. Conclusion

Many of the IT public procurement is very large scale and complex. In addition, services to be realized by it affect the convenience and safety of people's lives. Nowadays, governments and public officers actively attempt to take advantage of cost savings and private organizations' knowledge. However, in order to achieve the intent, and overlooking the entire environment surrounding the information system after procurement and operation also examined adverse measures, it is necessary to aim a good management of balance.

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