Visualizing a Business Risk of IT Dispute

— Applying a New Approach to Analyze Failure Cases of IT Projects —

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Increasing in the recent years are incidents of disputes between user and vendor to compensate for individual loss due to failures of IT system development projects (, hereafter IT disputes). Once after such disputes occur, both user and vendor consume tremendous resources and times to search and explain many evidences for proof, and they suffer from opportunity losses which could be avoided if they did without the IT disputes, even when winning a case. Moreover one suffers from magnificent compensatory payment, when losing a case. Such IT dispute is becoming a major management risk, since it threatens business growth and continuity of company organizations. Nevertheless, not only root causes of IT disputes, but also why the user and vendor companies failed to avoid the disputes, are not clear in most of IT dispute cases. That is, just like software in IT system is difficult to be visualized, the business risk caused by such IT dispute is also difficult to be visualized sufficiently enough to avoid the same dispute in the future. This paper tries to visualize a business risk to suffer from IT dispute. First, after reviewing legacy methods to analyze IT development cases, we clarify that a new approach is necessary to analyze IT dispute cases. Next, after we analyze recent dispute cases by the new approach, we specify individual root cause for each case, and visualize what common business risk, which caused the disputes, have been overlooked by the company organizations. We further discuss how such business risk should be coped with by societies of project management.

Keywords and Phrases: Business Risk, IT Dispute, Case Analysis,
                      Sustainable IT Development, Organizational Project Management

1. Introduction

Increasing in the recent years are incidents of disputes between user and vendor to compensate for individual loss due to failures of IT system development projects (, hereafter IT disputes). Once after such disputes occur, both user and vendor consume tremendous resources and times to search and explain many evidences for proof, and they suffer from opportunity losses which could be avoided if they did without the IT disputes, even when winning a case. And when losing a case, one suffers from magnificent compensatory payment. Such IT dispute is becoming a major business risk, since it threatens business growth and continuity of company organizations. However, since such business risk is invisible, similar IT disputes occur again and again, which might   block future development of social and economy by IT.

This paper tries to a visualize business risk to suffer from IT dispute. For the purpose, we first review legacy quantitative and qualitative methods to analyze IT development project, and shows that their approach could not identify any root cause of IT disputes nor clarify how and why the disputes occur. Thus we propose a new approach, so that a shape of a business risk of IT dispute may be visualized sufficiently enough to make much practical action to avoid the risk. Next, we investigate recent IT dispute cases due to abortion of IT renewal projects, and clarify all evidences for each case. After we analyze the cases by the new approach, we specify individual root cause for each case, and visualize what common business risk, which caused the disputes, have been overlooked by the company organizations. Moreover, we discuss how such business risk should be considered in the future.

2. Literature Review

Focusing on visualization of business risk of IT dispute, we review legacy methods to analyze IT project cases.

An approach is quantitative methods, which have been conducted mainly by academia. For example, Furuyama, et al.(2007) have many empirical research achievements to prove recommended processes for project managers to practice, by statically analyzing disclosed quantitative data of actual development project cases, while the cases themselves are closed. They analyzed data of successful project cases as well as some project cases with minor problems. However, data of serious problem projects (, hereafter

SPPs) like IT dispute cases, are excluded in their statistical analysis, because a book which provided the data source (IPA, 2006a) says that if difference between the data and the mean value exceeds the limit, then they are treated as statically singular point (quite rare cases). Quantitative approach by Furuyama and other recent researchers such as Serrador and Pinto (2015) have not clarified any root cause nor business risk of IT dispute so far.

Another approach is qualitative methods, which have been conducted mainly by practitioners. Smith (2001, 2002) proposed that troubled IT projects should have originated from 40 causes, by analyzing cases of many troubled projects. However, since he did not disclose the cases, there is no assurance of his proposal. Moreover, there is also no assurance that SPPs including IT dispute are involved in the analyzed cases. Other than above, there have been qualitative case analysis, including Yeo (2002) and Sutterfield, et al. (2006), Nikkei Computer (2008) and Standish (2018). However, any of them have the following problems.

- We cannot expect that the root cause of IT dispute may be identified by them, since they have not focused on SPP cases.

- The validity of their proposal lacks proof, unless the analyzed cases are disclosed. They lacked efforts to disclose them by excusing that it may harm personal and corporative privacy.

Moreover, most of suggestions based on these qualitative analysis lack specifics. For example, "the management should be involved in IT project" is often suggested, however the management cannot recognize what specific business risk should be focused on, what actions should be made to avoid the risk and when the management should participate in IT project. Since the analyzed cases have not been disclosed, they have failed to visualize the risk sufficiently enough to show why and how the risk occurred and to suggest how to avoid the same troubles.

It is IPA (Information-technology Promotion Agency, Japan) that first disclosed problem project cases with which vendor project managers can recognize project risk and understand how the same troubles can be avoided. IPA aggregated 193 raw cases mainly from vendors and disclosed necessary information of them, by concealing harmful privacy information, while preserving facts that indicate what cause made what problem in the individual original case (IPA, 2006b, 2007, 2008a, 2008b). 97 SPP cases, which caused magnificent influence to the management, are included in the 193 cases. By analyzing the SPP cases, research advanced to visualize the risk symptom and to suggest who should and how to avoid the SPPs (Ohtaka and Y. Fukazawa, 2010, 2011), much specifically than legacy methods mention before.

However, in IT dispute, user and vendor have different idea each other, regarding problem, mistake and causal relation between them. Thus they have different claims regarding cause (who is responsible) as illustrated in Figure 1. Since the IPA cases lacks such information, it is difficult to say that specific business risk of IT dispute has been visualized.
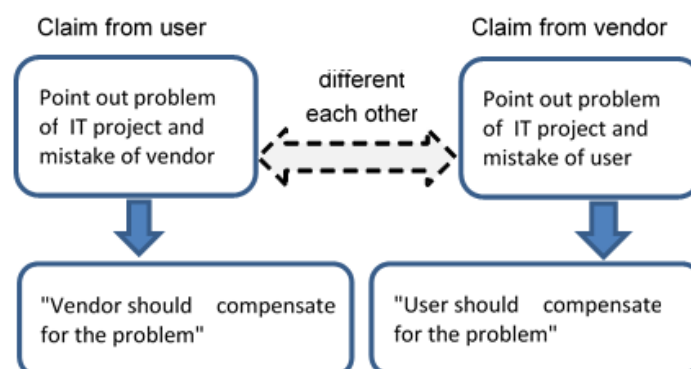

Figure 1: Example of IT dispute case which the legacy researches have failed to disclose and analyze

3. IT Dispute Cases and Their Analysis

Based on the background mentioned so far, we take a new approach to get the following 1) and 2) from user and vendor, and practice the following 3) case analysis.

    1) Conflicting claims of user and vendor

    2) Evidences that both user and vendor acknowledged

    3) Derivation based on the evidences without filtering

    That is, we aim to visualize the business risk specifically enough for avoiding the risk, by objectively identifying causes of IT dispute and process until the dispute occur, based on all of the fair evidences.

    In particular, IT Mieruka Institute (ITMI) obtained IT dispute cases contributed by members of ITMI, who have rich experiences of IT development and also had been members of sectional meeting in IPA. Typical 2 cases were chosen, which are often observed recently. After applying information processing similar to IPA's (limiting disclosure by concealing harmful privacy information in the cases) to individual case, we obtained the processed fact information (abstract of the case, 1) dispute points (claims of user and vendor) and 2) acknowledged evidences) as well as 3) derived results from the claims and the evidences.

    Note that, mission of court is to make judgement of claimed compensation. It is probable that proof of evidences is terminated when judge believe judgement can be made, even if the business risk is unclear. Thus, it has been difficult to prevent similar IT disputes caused by the unidentified business risk. On the contrary, in the new approach, the proof of evidences is continued until the business risk is identified. That is, the new approach does not terminate proof of necessary evidences of 2) until grounds for visualizing the business risk are derived by 3).

    In the following cases, we dared to exclude amount of compensatory payment and other information which may identify specific parties, since the disclosure is not objective of this paper.

3.1 Case1 (Legacy Migration Project)

[Abstract]

    User L had a system development plan which export legacy business application program, that have been maintained by major vendor more than tens of years on mainframe platform, to new open system without modifying program logic of the existing legacy system. L made a contract with another vendor Vl and ordered the system development to Vl, whose selling point is its own migration technology. However, the development project delayed too much for Vl to present any idea to keep delivery date specified in the contract. L decided to abort the project and stop the payment to Vl. Vl claimed the unpaid money to L, however, L on the contrary claimed compensation to Vl for loss due to delay of the system launch.

[Dispute points (claims of user and vendor)]

1) Cause of delay

Claim of Vl: It is necessary to disclose specification of data of the existing system, even when migrating the existing application programs to open system without modifying their logic of the existing system. L did not disclose the data specification, despite Vl's frequent requests of disclosure. Since L had not took control of the existing data specification, Vl had no means expect consuming tremendous times to analyze the specification for him. That is why the project delayed.

Claim of L: Vl had been ordered by the contract to analyze and clarify the existing specification. The delay is due to insufficient fulfillment of project management (PM) duty practiced by Vl.

2) Whether Vl fulfilled debt or not

Claim of L: Since Vl agreed the contract which specifies delivery date, Vl should fulfil the debt. Since Vl failed to assure to fulfil the debt, L had no mean except aborting the project. The abortion is caused by Vl's violation of PM duty.

Claim of Vl: There is no violation of PM duty. It is not Vl that decide the abortion of the project, but it was decided by L, who caused the delay of the project.

[Acknowledged evidences (Ev1-Ev4)]

Ev1: Multiple interpretations are valid in the contract, as far as who is responsible to clarify the existing data specification (L assumes that Vl is responsible, while Vl interprets that L is responsible). On

the other hand, IPA and METI (Ministry of Economy, Trade and Industry, Japan) have judged and announced that user should take responsibility of IT system requirement definition, including specification of existing systems. That is, based on a common understanding of the IT Firm (IPA and METI), when definition of existing system specification is insufficient, user may not pass the buck of project delay to vendor (the same idea as Vl's interpretation) (IPA, 2006c), (METI, 2007).

Ev2: L had received a proposal from sales person of Vl, which says "If you choose us as a system developer, our migration technology can let you free from legacy responsibility of system requirement definition." After that, L made a document of order specification at call for participation to competitive bidding of the new system development, and L just requested to construct the new open system as same as the existing mainframe system without disclosing any details of the existing system in the document (L also used the same document as a contract agreement with Vl).

Ev3: System requirement including the existing data specification had never been agreed upon by L and Vl, throughout the period from the initial contract to the project abortion.

Ev4: Based on model of contract by METI(2007) and definition of project by PMI(2016), project period, in which vendor can practice project management, starts from agreement of system requirement (project charter) and ends at system delivery.

[Derived results from the claims and the evidences]

1) Ev3 and Ev4 shows that vendor project had not started during the contract period. Thus we cannot identify any violation of PM duty of Vl. And Ev1 shows that the delay was caused by L, who defined requirement insufficiently (had not took control of the existing data specification).

2) Ev2 shows that Vl failed to practice duty of care, namely its organization failed to prevent IT dispute by correcting "uncontrollable sales". That is the IT dispute could be avoided by the company organization at the sales proposal before starting the contract, if it had let the sales person to correct the proposal and clearly explain to L "Our migration technology can let you free from legacy responsibility of defining existing application program specification. However, you still have to take the other responsibility of system requirement definition, including specifying existing data ", although Vl might have lost the contract.

3.2 Case2 (Agile Project)

[Abstract]

User W, who had wants to create new business and service and had to remake existing IT system, ordered vendor Vw to develop a new system by agile. However, the agile project could not present any achievement expected by W. W decided to abort the project and told Vw to cancel the agreement of the order. Vw claimed the unpaid money to W.

[Dispute point (claims of user and vendor)]

Claim of W: Vw promised that its agile technology can develop a desirable system for W, before the contract. However, systems developed in every iterations in the agile project of Vw, had been differ from one, which realizes new business and service that W desired. W do not need to pay for Vw, who broke promise.

Claim of Vw: W ordered Vw to develop the system after agreement of semi-delegation contract. Therefore, W should pay Vw as much cost as the resources that Vw consumed for the agile project.

[Acknowledged evidences (Ev5-Ev8)]

Ev5: The management of W requested IS (department of information system) in W to realize new system for new business and services. However, IS has insufficient resources and skill to cope with the request.

Ev6: A sales person of Vw proposed IS of W to order system development to Vw, while insisting rich achievements of agile development projects executed by Vw, and explaining "Our agile technology can drastically shorten development period than legacy water-fall based development, while realizing a system desired by user. Moreover, Vw takes care of everything required to execute agile project, even if user has no experience of agile development. User is just requested to acknowledge deliverables in every iterations, which are provided from TL (team leader of agile project) assigned by Vw".

Ev7: IS of W, with less experience of agile development, believed quick renewal of existing system, and got approval of the contract from the management of W.

Ev8: After the contract agreement, the sales person of Vw resigned and got a new job in another company. However, no history of his sales proposals were preserved in Vw organization. The management of Vw did not take any control of sales activities, although he did as far as technical activities of IT projects are concerned.

[Derived results from the claims and the evidences]

1) Although agile has potential to shorten development period, by deterring requirement definition more quickly in its iteration process, it is not a magic, which can be applied to every cases unconditionally. It's a mandatory condition that user takes role of requirement definition, which are usually took by TL in agile project. If the condition is not satisfied and user leaves all works of TL to vendor, there is no assurance that the agile project achieve its objective. Actually, Ev5, Ev6 and Ev7 show that agile project could not achieve its objective and just repeating iterations, since W left most of works of requirement definition to TL (a member assigned by Vw not by W). It is thought that the agile project aborted because W did not take role of requirement definition itself.

2) Ev6 and Ev8 show that the management of Vw just left most of works of getting order from W to the sales person. After he tried to somehow complete the sales mission, "uncontrollable sales" occur, where his proposal become a magic that allowed IS of W to understand that IS has less obligation to define requirement, if the proposed contract is agreed. If the "uncontrollable sales" was controlled by organization of Vw, IT dispute could be avoided.

3.3 Summary

Each cause of project aborts and each trigger of troubles due to the cause can be summarized as Table1, based on case analysis mentioned above.

Table 1: Summary of analysis of IT dispute cases

Case	Cause of project abort	Trigger of trouble due to the cause
1	Insufficient requirement definition by user	Vendor proposed its migration solution for user to omit requirement definition
2	Insufficient skill and resource to define requirement in user	Vendor proposed its agile solution for user to be free from role of requirement definition (TL)

4. Visualizing Business Risk

Legacy research activities of IT case analysis have achieved less actual outcome to stop the increase of IT troubles. One reason may be that they have not sufficiently surveyed actuality of the IT firm. For example, "the management should be involved in IT project" has been often concluded by the activities, however since the management can have less vision of what specific action should be made in actual company, such conclusions has failed moving forward further discussions for many years. Thus in this paper, we first survey the actuality of user and that of vendor, and then we visualize the specific business risk and discuss how to move forward, based on the survey.

4.1 Actuality of User

IPA (2006c) has been alarming that if user orders to develop IT system with insufficient requirement definition, it is highly probable that troubles such as delay or cost overrun of the IT project. IPA and METI disclosed a principal that buyer (user) should take responsibility of requirement definition (IPA, 2006c) (METI, 2007) to avoid troubles like IT disputes (that is, they made a protective wall to prevent the troubles as illustrated in Figure 2). Thus, user is required to make every efforts to observe the principle by taking the responsibility by strengthening its ability to define requirement of IT system.

However, it is not easy matter for user to observe the principle, since most of IS in the user has been allocated limited resources in actual. User, who has insufficient power of requirement definition, are apt to rely upon help of outside vendor.

In such situation, it is easier for sales proposal of vendor to let user misunderstand that there exist a magic which breaks a hole in the protective wall, and let user go forward through the hole without taking sufficient requirement definition obligation. However, the magic is just like "silver bullet", which is denied its existence as far as software are concerned by Brooks (1987). Actually it made holes in the protective wall, but caused aborts of IT projects and progressing to IT disputes, as proved by Case1 and Case2, as follows.

Case1: User misunderstood that a new (migration) solution proposed by vendor must be "silver bullet", which let user free from requirement definition obligation.

Case2: User misunderstood that a new (agile) solution proposed by vendor must be "silver bullet", which let user free from requirement definition (TL) obligation.
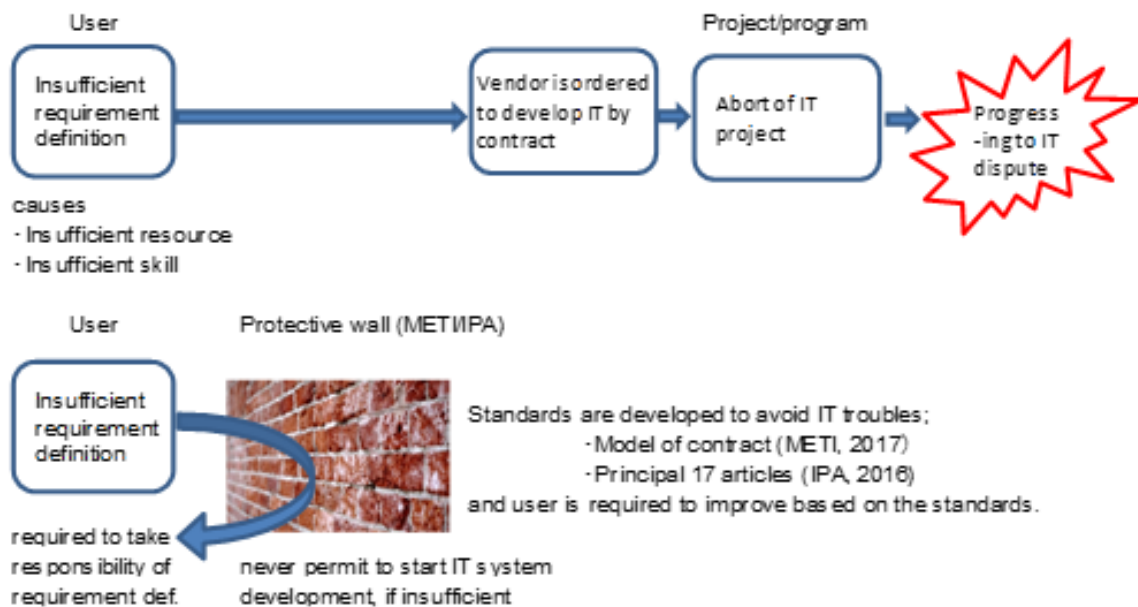

Figure 2: Typical procedure until IT dispute occur and its prevention (protective wall) by METI and

4.2 Actuality of Vendor

Vendor organization generally impose an order quota to sales person. To fulfil the quota, it is usual that the sales person proposes company's solution to user for getting order by insisting its merit. However, the sales person could lead the user to misunderstand the solution as "silver bullet", which don't have any applicable constraint (demerit), whether intentionally or not intentionally as can been seen in the following cases.

1) Selling "silver bullet" without intention

Generally, solutions have their various applicable constraints. It is probable that sales person, who have less technical skill, may propose solutions without understanding every applicable constraints. In this case, the sales person might sell "silver bullet" without intention.

2) Selling "silver bullet" with intention

If sales person disclose all applicable constraints to user, risk of failure to receive order increases, since the user may understand the disclosed constraints as demerits and quit order to the sales person. Particular in the organization where the upper manager of the sales person do not accept the failure and pressures the sales person to receive order from the user, the sales person is apt to avoid the risk of the failure by sealing necessary constraints to the user, while another risk of

IT trouble becomes greater after receiving order. In this case, the sales person might sell "silver bullet" intentionally.

4.3 Visualizing Business Risk Related to IT dispute

It is probable that "uncontrollable sales" may occur in any vendor company, if the company organization fails to control sales person not to sale "silver bullet" solution to user.

Since "uncontrollable sales" allows to dig a hole in the protective wall of Figure 2, the vendor might receive order to develop IT system, however after agreement of the contract, troubles of IT project/ program and successive IT dispute might occur. This must be a business risk, which cannot be managed by project/program manager nor by sales person. No one except the vendor company organization can manage the business risk and take the responsibility to avoid the risk.

If the vendor organization, who usually pressures sales person to receive more orders, fails to prevent "uncontrollable sales", it is a proof that the organization has unskilled management of the business risk. In this sense, the unskilled organizational management of the business risk, which allows "uncontrollable sales", triggers business risk of IT dispute to occur (Figure 3).

The business risk provokes dispute related to IT project/program, particularly when insufficient requirement definition is practiced by user, and have magnificent influences to both of the managements of vendor and user.
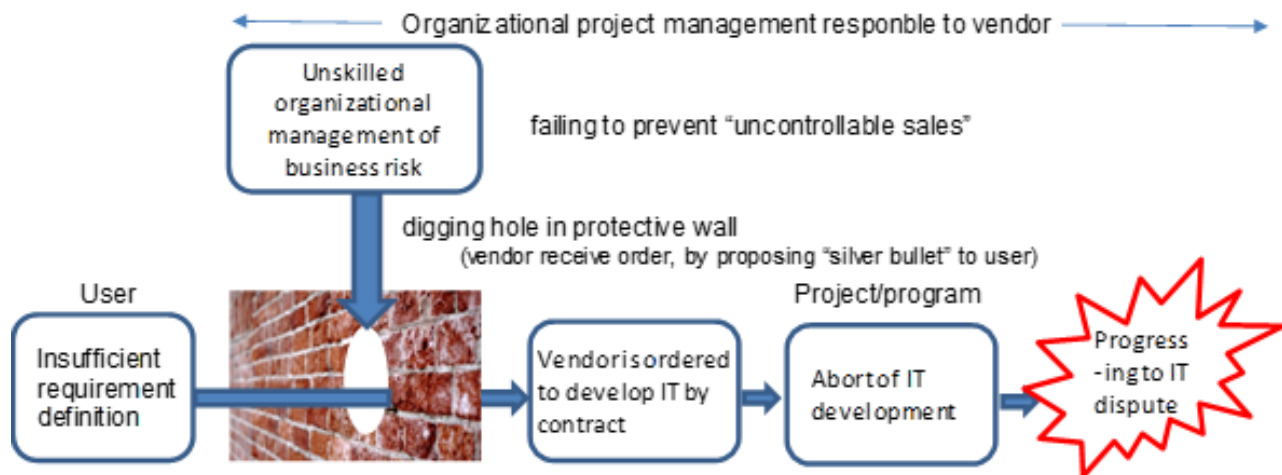

Figure 3: A business risk of IT dispute, which is visualized by the new case analysis

5. Discussion

The IT disputes, whose cases were disclosed in this paper, could be avoided, if individual user took sufficient role for requirement definition. Efforts of software engineering have been practiced, such as developing requirement engineering body of knowledge (REBOK) (JISA, 2011) and other books for empowering requirement definition skills in users. However, IT disputes have not been prevented for many years in reality. This indicate that there is a limit to prevent IT dispute, if we only rely upon software engineering approach.

This also indicate that it becomes necessary to take one more approach, which copes with the business risk of IT disputes, based on an assumption that incidents of insufficient requirement can be happen in reality. That is, management approach to reduce IT disputes by managing the business risk is also needed to be consider, as well as software engineering approach.

From viewpoint of management approach, the bushiness risk has its root before agreement of the contract to start project/program in Figure 3. Thus, project/program manager cannot take the responsibility. However it is clearly organizational project management of vendor (,in which sales persons are involved) that should take responsibility of the bushiness risk as illustrate in Figure 3. And if user could know capability of organizational project management of vendors before contract, user could mitigate

the risk of IT disputes by selecting a vendor with the best capability and eliminating vendors with poor capability.

Then we should next see how such organizational project management has been standardized and what solutions to measure such organizational capability have been provided by major institutes of project management.

Project Management Institute (PMI) developed organizational project management standard, OPM3 (PMI, 2013) to measure and certificate capability of organizational project management for individual company. Although it also specifies portfolio management (PMI, 2008a) as well as project/program management (PMI, 2016) (PMI, 2008b), we cannot find any specification of the business risk like Figure 3 nor find management standard for the risk. Thus, user cannot select a proper vendor for avoiding IT dispute, by evaluating individual capability of organizational project management of vendors based on the OPM3.

International Project Management Association (IPMA) and other societies related to information and/or management also do not have scope of the organizational project management of Figure 3, which involves sales activities before starting activities of IT projects/programs in vendor organization. Therefore, we cannot observe any activity to cope with risks caused by problems like "uncontrollable sales" in Figure 3 and any solutions to measure organizational capability for avoiding the risks in the societies.

We cannot expect to stop increasing IT disputes, if we do not have any action. Since social demand to avoid IT disputes may become larger, the following actions may be required much more in the future.

1) Activate research on organizational project management of the business risk to avoid IT disputes.

2) Responding to the social demand to reduce IT disputes, enhance organizational project management standards by introducing the research achievements, and progress to develop a certification system of organizational capability based on the standard, so that users also can avoid IT disputes.

6. Conclusion

This paper visualized the business risk of IT dispute, by applying the new approach to analyze cases obtained from user and vendor. We also discussed how to cope with the business risk.

Research on organizational project management to avoid the business risk is being practiced in ITMI, and the achievements will be disclosed elsewhere in the future. We further proceed to visualize additional business risks by collecting and analyzing more IT dispute cases by asking for understanding and support also from courthouses.

References

Brooks, P. F. (1987). No Silver Bullet － Essence and Accidents of Software Engineering. *IEEE Computer*. 20 (4),10-19.

Furuyama, T. et al. (2007). Analysis of the Factor that Affect the Performance of Software Projects. *Information Processing*. 48 (8),2608-2619.

IPA, (2006a). A White Paper of Software Data. Nikkei BP, Japan.

IPA, (2006b). MIERUKA of IT Project (About Lower Development Phase). Nikkei BP, Japan.

IPA, (2006c). Principle 17 articles (pp.87-110 in Ensuring quality of requirement by involving the management 2nd ed. Ohmusha, Japan.

IPA, (2007). MIERUKA (Visualization) of IT Project (About Upper Development Phase). Nikkei BP, Japan.

IPA, (2008a). MIERUKA of IT Project (About Middle Development Phase). Nikkei BP, Japan.

IPA, (2008b). MIERUKA of IT Project (Summary). Nikkei BP, Japan.

JISA, (2011). Requirements Engineering Body of Knowledge (REBOK) (1st ed.). Kindai Kagakusya, Japan..

METI, (2007). Model transaction / contract (1st ed.). Retrieved July, 30, 2019 from https://www.meti.go.jp/policy/it_policy/keiyaku/index.html

Nikkei Computer, . (2008). 2nd Investigation of Actual Situation of Projects. Nikkei BP, Japan.

Ohtaka, H. and Fukuzawa, Y. (2010). Managing Risk Symptom: A Method to Identify Major Risks of Serious Problem Projects in SI Environment Using Cyclic Causal Model. *Project Management Journal.* 41 (1),51-60.

Ohtaka, H. and Fukuzawa, Y. (2011). Analysis of causes of serious problem projects focusing on stakeholders. *Journal of the Society of Project Management (Research Paper).* 13 (3),19-25.

PMI, (2008a). The standard for portfolio management, second edition. PMI, USA.

PMI, (2008b). The standard for portfolio management, second edition. PMI, USA.

PMI, (2013). Organizational project management maturity model (3rd ed.). PMI, USA.

PMI, (2016). A Guide to the project management of Knowledge (PMBOK) (6th ed.). PMI, USA.

Serrador, P. and Pinto, J. (2015). Does Agile work? ― A quantitative analysis of agile project success. *International Journal of Project Management.* 33 (5),1040-1051.

Smith, J. (2001). Troubled IT Projects - Prevention and Turnaround - . IEE, London, UK.

Smith, J. (2002). The 40 Root Causes of Troubled IT Projects. *Computer & Control Engineering Journal.* 109-112.

Standish Group, (2018). CHAOS Report. Standish Group, US.

Sutterfield, S. et al. (2006). A Case Study of Project and Stakeholder Management Failures: Lessons Learned. *Project Management Journal.* 37 (5),26-35.

Yeo, K. (2002). Critical Failure Factors in Information System Projects. *International Journal of Project Management.* 20 (1),241-246.