User Acceptance of a Software Tool for Decision Making in IT Outsourcing: A Qualitative Study in Large Companies from Sweden

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Abstract. Decisions for IT outsourcing are very complex and needs to be supported by considerations based on many (multiple) criteria. In order to facilitate the use of a specific tool by a decision-maker in IT outsourcing, we need to find out whether such a tool for this purpose will be accepted or rejected or what improvements must be added to this tool to be accepted by some IT decision makers in large companies from Sweden.

Keywords: IT outsourcing, decision makers, ITO tool, user acceptance, decision making.

1 Introduction

A systematic analysis was often absent in early stages of IT outsourcing decisions [14]. Outsourcing decisions will have long term effect on the IS strategy, and therefore a systematic analysis should be performed [14]. It is an important business change whether a company should outsource IT or not. For this purpose, the large companies could learn from their best practices and the way to improve the ITO process [11]. Decisions in IT Outsourcing are complex decisions, so in order to facilitate this process the IT tools should be used. However, there is an issue of acceptance of such systems and tools by companies/decision makers. Why should manager accept this tool, when over a long time many decisions on IT outsourcing have been taken successfully without such tools followed the established at that time processes and practices. Thus, there is need for such a tool to be accepted by IT decision makers in order that the get expected (advantages) benefits. In addition, there is a need to understand the way a decision is made and the processes implemented. Since there is a lack of available tools for IT outsourcing decisions in the market [10] there is a need to investigate if the accepted tool would contribute to the decision making, which we believe will increase the effectiveness of decision process and ensure more reliable decision making.

There is a need for a framework for making decision in IT outsourcing [7]. In our study, we will contribute with an IT Outsourcing Tool (ITO Tool) to see if a software tool can be useful and helpful for IT outsourcing decisions [10]. We believe that such

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a tool developed for IT outsourcing decisions can facilitate and improve the decision making in that area. This will help to structure the way for analysing the enterprise situation and help to decide whether the IT outsourcing should be performed or not. In addition, we are of opinion that improvements of the decision making process will relate to time saving, performance of the decision making and the transaction cost of IT outsourcing. Due to the fact that human's willingness to accept and adopt new artefacts is challenging, and has been studied over long time, there is a need to investigate if the ITO Tool would be accepted by decision makers. In this study, we will make use of adoption theory from [8]. The adoption theory is called the Technology Acceptance Model (TAM), which is a well used instrument to find out whether a system will be accepted or rejected. The ITO Tool must contribute and improve today situation to be accepted [8], There are many frameworks/models, which could be used for decision, however not all frameworks/models can be equally applicable for the established outsourcing processes. The main purpose of the study is to find out, with use of the Technology Acceptance Model (TAM), whether the ITO Tool for decision making of IT outsourcing would be accepted or not, and if negative – to understand the reasons for rejecting it. Our research questions are; In which way (to which extent) can the ITO Tool be accepted for some decision makers in IT outsourcing in Swedish companies of a global scale, and what contribution can be provided to the ITO Tool?

2 Research Background

2.1 Description of the IT Outsourcing Tool (ITO Tool)

To not mix up the definition "ITO Tool" as a general tool in this paper, we will use the term "ITO Tool" for the specific software product we will evaluate. The main purpose of the ITO Tool is to provide assistance to the managers to make decisions at initial phase about IT outsourcing without having external consultancy. The ITO Tool according to the researches is business neutral, which means that it is not made for any specific business area, like manufacturing, banking or other [10]. Thus, by being business neutral, the tool can be used by managers in many different outsourcing cases. Furthermore, the ITO Tool is neutral because, there is no algorithm that encourage or discourage to outsource IT or not. Transaction Cost Theory (TCT), according to Williamson is rather conservative and does not encourage IT Outsourcing if there are no strong reasons showing the advantages [20]. ITO Tool is based on TCT. ITO Tool can "*highlight the potential risks, which may be hidden by the cost savings regarding IT outsourcing"* and gives description about them [10]. Moreover, this helps the managers to get information regarding ITO considerations which they do not think to consider.

A risk assessment contains four dimensions, the risk factors, scenarios of what can happen, the consequences and risk mitigation mechanism [5]. The ITO Tool is developed in MS Excel application and a screenshot of the tool is presented in Figure 1. The ITO Tool lists 80 questions from different risk areas and the scenarios are the answers the users select. In the end the consequences are shown in a graph, where the risk exposures are calculated. The mitigation mechanism is handled by highlighting the high risks that must be mitigated before further proceeding of IT outsourcing. The

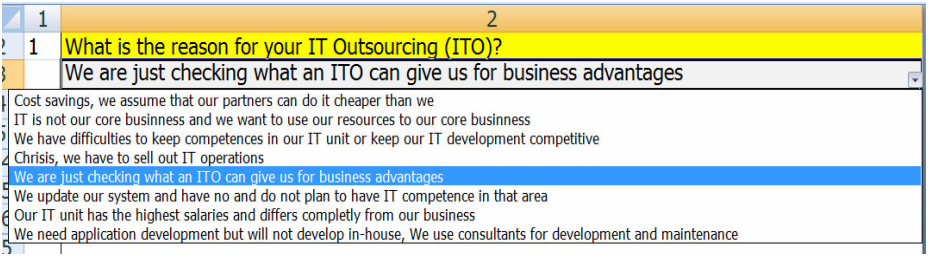

Fig. 1. Screenshot from the ITO tool [10]

ITO tool is presented with a graphical view of the risk exposure from the risk assessment with recommendations about to do the IT outsourcing or not [10].

2.2 Risk Assessment of IT Outsourcing

Risk management of decision making for IT outsourcing have been studied intensively in the last ten years, and still new risk factors appear according to new fields of type of outsourcing, for instance cloud computing [15]. Both financial benefits and risks are elements for making decisions of IT outsourcing [12]. Making decision for IT outsourcing includes high degree of uncertainty according towards price/performance, underlying economic shift, business and IT alignment and supplier selection and its contract negotiation [19].

Enterprises should be aware to outsource too much, due to decreasing grade of successful outsourcing [13]. On the other hand, selective outsourcing is not more successful than total outsourcing even if that is more uncommon [16]. Anyhow, Outsourcing is a risky endeavour. Outsourcing enables the companies to refocus on their core business [16], and the initial agreements must consider the risk profile of the unique deal [6].

Risk management are assessed or analysed as a probability and effects (consequences), which are mapped according to the very high, high, moderate (medium), low and very low scale [18][17]. Effects can be assessed in catastrophic, serious, tolerable or insignificant [18]. Risks should be considered as a negative event [2], but also a potential negative outcome due to uncertainty future developments [21]. “Managers are making decisions with respect to IT and outsourcing is often overly optimistic, according to [9]. They take their decisions to outsource based on a best case scenario”. On the other hand, [2] noticed that ”once risk exposure is explicit, and the possible compromises clear to the managers, risk becomes a lot more manageable”.

In the review of the research literature, we have found different ITO frameworks. In our research, we have selected and adapted from [4] the ITO risk assessment framework. Our decision model, implemented in the ITO tool, is covering the risk factors presented in Table 1. In fact, as a matter of the problem complexity with interlinked risks and mutual dependencies of different events it is not possible to isolate each risk, therefore in the ITO Tool a question can cover one or more risk factors[1]. In

[1] We want to keep the number of questions for assessing the risk exposure as low as possible. Therefore, we try to also to combine different ITO risk areas.

this way, the result will have a high coverage of different risk factors. There is also an obvious overlapping between the risk factors and the definitions of them. In assessing the overall risk exposure and the individual risk exposures resulting from different decisions, our ITO Tool has used the assessment method for the risk exposure as [1] has proposed.

Table 1. IT outsourcing risk assessment framework (adapted from [4])

Risk Factors (The figures within the brackets are the numbers of questions that are referring to the risk factors used in our ITO Tool)	**Scenarios**	**Consequences**	**Mitigation mechanisms**
• Asset specificity (6) • Small number of Suppliers (1)	Lock-in	Cost Escalation and Service Debasement	• Mutual hosting • Dual sourcing
• Uncertainty (2)	Costly contractual amendments		• Sequential contracting • Contract flexibility • Short term contracts
• Uncertainty (2) • Client's degree of expertise in IT operations (5) • Client's degree of expertise in outsourcing contracts (4) • Relatedness (functional and organizational) (2) • Ex-ante imperfection (24)	Unexpected transition and management costs		• Clan mechanisms • External expertise procurement
• Measurement problems (2) • Supplier's degree of expertise in IT operations (5) • Supplier's degree of expertise in outsourcing • Contracts (4)	Disputes and litigation		• Alternative methods of dispute resolution • Clan mechanisms • Procurement of external expertise

The risks from the ITO tool are calculated for each question and represented in the end as sum of these risks and the tool calculates the risk exposure (RE) according to the next formula [10]:

$$RE_{tot} = \sum_{i}^{N} Pr(UO_i)*L(UO_i),$$

The formula: $Pr(UO_i)$ means: the probability of an undesirable outcome *i*, and $L(UO_i)$ is the loss of undesirable outcome *i*. RE_{tot} is the accumulated risk exposure for the N number of risks. In IT outsourcing context the losses of undesirable outcome are losses about outsourcing contract and probability of an undesirable outcome is function of such losses [2].

The risk exposure in the ITO Tool is presented on the figure below as a plane graph. The number of items is the questions, which user answered are stated on the

vertical line. The calculations of risks are presented on horizontal line, according to scale they are weighted as small losses - 0, 2, medium losses – 0,5 and critical losses- 0,95. The decision about outsourcing has been presented according to calculation of losses, which has been provided by decision maker.

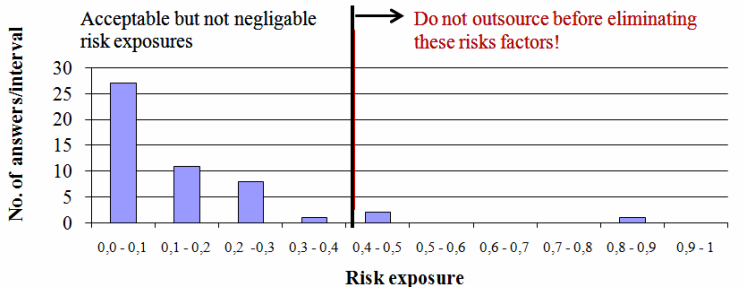

Fig. 2. Distribution of the questions that generate RE from the ITO tool [10](for a particular example)

2.3 Research Methodology

For assessing the acceptance of the ITO Tool, we have done interviews with executives' experts in IT outsourcing in large companies from Sweden, with experience in IT outsourcing. The interviewees are mentioned in Table 2 regarding their position, experience in IT outsourcing, type of relationships from the four companies' part of our research analysis.

Table 2. Research sampling

Position in the company of the interviewee	Years of IT outsourcing experiences	Type of company: All large companies	Companies
Executive	14 years	Advisory service	Company A
CIO	1,5 years	Buyer	Company B
Head of Procurement	7 years	Buyer	Company C
Senior sales manager	Not provided	Both Seller and Buyer	Company D

We believe that our sampling size cannot make any generalization, but we will get useful information of what best practises from some decision makers consider to make decisions in IT outsourcing. Due to type of methodology, we have got deep interviews of executives in Swedish global companies, which have knowledge and experience in this topic. Our findings regarding the technology acceptance of the ITO Tool will provide great value towards further development of this tool, or if such tool is not accepted at all into decision making in IT outsourcing.

Before we collected data of technology acceptance, we introduced the ITO Tool to the decision makers, so that they could touch and feel how the tool worked in decision making of IT outsourcing. We shortly described the purpose of the ITO Tool, and that the tool was based on 80 questions with multiple options of answers, and the algorithm behind for assessing the risk exposure [10].

The computer with the ITO Tool installed was given to the interviewee, where the interviewee tested the ITO Tool with a case in their mind. The duration time of answering all the questions was given up to 20 minutes for all four companies.

After the software tool was tested, we asked questions from the TAM [8], which we had rephrased from quantitative questions with answering in a seven point Likert scale to qualitative questions with use of the main keywords from each variable of TAM and described below.

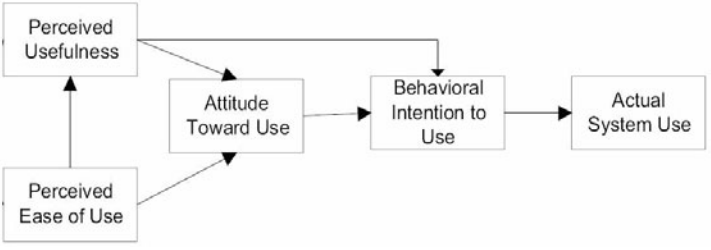

Fig. 3. Technology Acceptance Model, TAM [8]

2.4 Perceived Usefulness

The keywords from TAM for the variable Perceived usefulness are "useful", "helpful", "performance", "effectiveness", and "provide" [8], and the questions we created were:

a) What do you think the purpose/advantage of this tool can provide you? (Provide)
b) How can use of the tool provide advantage in IT outsourcing decisions? (Performance and effectiveness)
c) Do you think the risks are listed with values of Risk Exposure was helpful? (Helpful)

2.5 Perceived Ease of Use

The keywords from TAM for the variable Perceived ease of use are "easy to use", "understandable", "easily find" and "learn" [8] and the questions we created were:

a) Did you like the interface of this tool? Why or why not? (easy to use and understandable)
b) Will it be easier to use if the risk-types would be grouped? (easily find)

2.6 Attitude towards Use Are the Impressions from Perceived Usefulness and Ease of Use

The keywords from TAM for the variable Attitude toward use are "good idea", "advantage" and "pleasant experience" [8] and the questions we created were:

a) As a person, do you easy adopt new technology? (Regarding personal adoption)
b) In what way gives the tool you a pleasant experience? (pleasant experience)

c) Do you think the tool is a good idea, why? Suggestion for improvements?(good idea).

2.7 Behavioural Intention to Use, Are Dependent on the Attitude of the Decision Tool

The keywords from TAM for variable Intention to use are "thought to use", "going to" and "recommend" [8] and the questions we created were:

a) After testing the tool, do you think you will use it, why and why not? (Thought to use)
b) Will you recommend this tool for other colleagues? Why and why not? (Recommend).

3 Results from User Acceptance of IT Outsourcing Tool (IT)

3.1 User Acceptance of Company A

The interviewee from the Company A finds the tool useful, since anything that can make the decision makers to think and assess the readiness for the IT outsourcing is good. Moreover, he/she finds that all questions are relevant, and the tool can be used as an advanced check list, but also be useful to provide objective. For instance the CIO needs a good argument for not outsourcing, and then the objective tool gives the CIO a winning argument. However, the Company A finds the tool useful, but only as a readiness tool such, as a check list that can be used to get useful objective viewpoints. We do not think the Company A accepts that the ITO Tool is a tool for making decision, but rather a tool for assessments.

As concerns disadvantages, the Company A finds it difficult to see if the ITO Tool covers all different criteria, and provides the ranking from important questions to less important ones, and how the questions are relevant to each other. The tool looks more like a readiness, or may be a subsidiary, back-up tool rather than a decision tool. Therefore, the ITO Tool should have been divided into parts, first where one assesses the readiness, next a "yes"/ "no" decision or cancel and full stop. Moreover, the output should be descriptive instead of digits, where the output make classification by risks level, for instance like virus scanning software, where it is "two very high", "five high", "three medium" risks, and so on. Moreover, the interface works fine, but a web-based interface would be preferred, instead. However, the Company A stated that decision makers should use a tool like a robot, and cannot use only one tool for making a big outsourcing, but the tool can be used for interpretation with the view to get another perspective to assess the risks.

The Interviewee from the company A is a medium adopter of new Information Technology. However, the interviewee was not in a position to accept the tool how it was now, but he/she would accept the ITO tool with some improvements introduced.

3.2 User Acceptance of Company B

The interviewee from the Company B thinks that the ITO Tool is good enough and provides the needed help. On the other hand, the interviewee does not have trust in the

tool 100% and wants to have a possibility to check whether the tool was the right one or not, based on earlier experiences. Moreover, as he/she assumed it should be possible to customise the tool. Regarding the technical side of the user interface, the questions should be shown without scrolling, and the answers should be possible to see straight away. Anyhow, regarding Company A and E thinks that the ITO Tool will have more need for such a tool, when he/she is inexperienced in the decision making which he/she is.

The Interviewee from the Company B is a medium adopter of new Information Technology, and will accept the tool and recommend the tool to other colleagues. Moreover, we did not get any other feedback of the perceived usefulness of what the advantages or disadvantage were, and whether the ITO Tool was useful for the purpose of the decision making in IT outsourcing, but instead, information about cosmetic changes from the perceived ease of use. There was one feature he/she wanted is a possibility to check whether one can trust the tool or not in the decision making. A reason of not having any new suggestions or improvements of the functionality of making decision can be related to the low working experience of the interviewee - 1.5 years in IT outsourcing, on the other hand we think that Company B easily will accept the tool since the Company B do not have any formulized sourcing processes, only supporting guidelines.

3.3 User Acceptance of Company C

The interviewee from the Company C finds the user interface fine where the questions and answers are shown in a good format and the decision makers can assess the risks visually instead of engaging into a mathematic exercise. Moreover, he/she liked to look at various risk types by reviewing risk, where he/she got a clear review. The ITO Tool could be deployed in different steps of the sourcing process since this tool covers a lot of different perspectives, where the question and answers need to be interpreted. The numeric figures are a good way of showing the result. However, the tool can be deployed as it is, and be useful, but the ITO Tool can also be used in communication with various stakeholders, and to create joint work and discuss the risks around.

On the other hand, in the decision making, some risks cannot be mitigated, since it depends on the risk profile of how much risk he/she can accept. Moreover, it should be possible to customise the tool according to the risk profile for the decision case, but he/she will recommend the tool to other colleagues after improvements.

The interviewee is a medium adopter of the new Information Technology; and accepted the ITO Tool. We have got an important feedback from him/her, namely, on the concept of reviewing risks, on the question and answering exercise instead of calculating the risks, and on the criteria, which were broad and could be used in different steps in the sourcing process. The only drawback was that the decision maker would have different risk profiles and might not mitigate certain risk depending on the sourcing case.

3.4 User Acceptance of Company D

The interviewee from the Company D thinks that the ITO Tool is a good help to structure the thoughts regarding decision making, and can be used as a check list, but the

risks could be assessed alone. Moreover, it was for the first time when the interviewee has seen such a decision tool, and he/she believes that it would help decision makers, if they start from the scratch. On the other hand, the interviewee does not like that; the ITO Tool had a mathematical decision model, considering it a too complicated design. The interviewee thinks the risks should be grouped to see which area of risks is under the assessment. Even if the Interviewee looking at the same risks in a group meeting, to see if the outsourcing process should continue or not, the number of 80 questions that have to be addressed in the tool seem to be too excessive and need to be considerably reduced.

The interviewee is a late adopter of new Information Technology, and does not want to accept the ITO Tool due to the fact that the interviewee was looking at the same risks but in another way, as we know from the best practises as well. On the other hand, the interviewee sees the potential in the tool and finds it useful and helpful for decision makers without any way of doing risk assessment. We think the reason of not accepting the ITO Tool by the interviewee was rather subjective one and depended on the personal perception and experience, and not on the quality of the ITO Tool itself.

4 Conclusions and Recommendations

First of all, for the purposes of the study we would refrain from any generalization, due to the small sample size, but we believe that our "lessons learned" of the user acceptance from our interviewees with executives from large Swedish companies experts in IT outsourcing, will contribute with usefully information whether a such ITO Tool will be accepted or not for decision makers in IT outsourcing.

4.1 In Which Way Can the ITO Tool Be Accepted for Some Decision Makers in IT Outsourcing in the Large Swedish Companies?

The Company A expressed itself for the tool to be divided in the following two parts: assessment of readiness and decision making - "yes", "go" and "not-to-go" for IT outsourcing. Due to the problem of a lack of a distinctive difference between readiness and decision making in the ITO Tool, it is also difficult to see if this tool covers all different criteria, and to see whether the questions are relevant to each other, let alone, ranking between important and less important questions. These deficiencies should be improved before the Company A will accept the ITO Tool in its work.

The Company B asked for mostly cosmetic changes to be able to accept the tool. We did not understand this position clear since, to our firm understanding, cosmetic change, as we think do not affect the decision making purposes of the tool, but we think that the perceived easiness of using the ITO Tool had effect on the acceptance of the tool by the said Company.

The Company C has accepted the tool as of the outset. In particular, it liked the way of assessing risks from a list, where various types must be reviewed to get a clear view. According to the company's the tool can also be used in communication with various stakeholders to create joint work and discussion around the risks.

The Company D noted the usefulness in the ITO Tool for the decision making, since the Company D has been practicing the risk assessment in the similar way in group meetings. At the same time, the Company D did not accept the tool, which, to our clear perception, was motivated by a personal attitude of the interviewee and, namely, his/her recent personal adoption of new information technology.

4.2 What Contribution Can Be Provided to the ITO Tool?

A contribution for the ITO Tool acceptance is a list of suggestions of new improvements in the user interface functionality, but also some new features in the ITO Tool.

Functionality

- Should be possible to customise the tool.
- The ITO Tool questionnaire should be divided into two parts. The first is readiness, - if you are ready or not, and the second part, given that you are ready, - go to outsource or not, then full stop
- Reduction of the number of questions.

User interface

- All questions should be displayed without scrolling, and it should be possible to view the answers straight away.
- The ITO Tool should in a more clear way cover all criteria, and to reflect the ranking between the most important questions and less important ones, as well as to show the interrelation between the questions.
- The output in a descript way should replace the digits and a summary like a virus scanning software, where the classification of how may high risks, medium risk, low risks.
- The question could be grouped by risk types, but the graphical result does not need to be grouped. The purpose of grouping risks is to find the problem area, but also as Company C suggested, use the ITO Tool as a communication tool, where you can use different parts from the tool, you can assess with different professions.

New features

- Want to compare own experience with the tool, to see if the taken risk was consider right or not. If this feature will increase the trustfulness to the ITO Tool, then it is needed to get higher opportunities for use acceptance.
- The tool would be extended with evaluations criteria for supplier selection.
- Type of Risk Profile will be introduced, having in mind that some risks cannot be mitigated and one has to accept certain risks.
- From best practises, check the suppliers financial stability, in supplier selection
- From best practises, it seems that selections of different type of relationships is part of the sourcing process, but maybe implement interdependencies between criteria that can make suggestions of what type of relationship should be selected.

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