IT INVESTMENT EVALUATION PRACTICE: USING A.N.T FOR ANALYSIS IN MALAYSIAN LOCAL AUTHORITIES.

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ABSTRACT

This research is to understand how evaluation is being used in managing IT investment. IT investment evaluation is an area to investigate mainly in the rise of computerized information system usage that rapidly growing with the support of latest technology, customer's demand and investment by the organization. In fact, it is not completely understood and valued by organization or government. In order to be competent, the evaluation should be assessed and justified. However, its implementation is hazy yet few organizations are aware of such evaluation implementation. Evaluation research is inadequate in public sectors and hardly reported especially in Malaysia. Actor Network Theory (ANT) is used to study the agents involved in IT evaluation practices and determine the influence of evaluation practices in local authority in Malaysia. In addition, this research will identify the impact of evaluation methodology employment towards the current issues from the ANT perspectives. This qualitative study approach was conducted in local authorities, focusing on pre and post evaluation of information system invested. ANT offered heterogeneity in describing and understanding the interrelationship of socio-technical aspect in IT investment evaluation analysis for Malaysian local authority. The findings revealed that lack of formal IT investment evaluation, low awareness level on the importance of evaluation, less exposure on the evaluation methodology and inappropriate appraisals of the proposed IT investment projects caused certain local authorities unable to deliver the benefits expected. With lack of formal IT evaluation, organization loses benefits and waste resources.

Keywords: Actor Network Theory, IT Investment, Information system, Malaysia Local Authorities

INTRODUCTION

Information technology has evolved its application and usage. Many organizations have used IT to improve customer service and product delivery, increase flexibility and facilitate innovation (Al-Yaseen et al, 2010). IT has proven to deliver such good benefits to the organization and many firms are investing and have become dependent on IT.

Gyampho-Vidogah, (1999) mentioned if companies are strategically acquiring the full potential of IT, they must evaluate its direct and indirect benefits and cost prior to its implementation, as investment in IT can form a considerable part of a company's capital expenditure. This has shown that evaluation is significance for the growth of an organization.

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The issues of evaluation has been identified such as participant, power issue (Cordoba J. et al., 2003), measurement (Hubbard,2010), political game during evaluation, lack of concentration of social and organizational factors (Blackler and Brown,1988) and failure to have mutual agreement within organization or partner involved (Keen, 2010).

Evaluation practice is significance for the growth of organization. The purposes of IT evaluation are typically as a basis for decision-making, control or accountability, legitimizations of a decision already taken (Marthandan, 2010). These leads to the importance of evaluation practice in organization.

THEORETICAL BACKGROUND: THE ACTOR NETWORK THEORY

The actor-network theory supposes everything to be an actor, where elements of any kind hold together such as humans, technological artifacts, organizations and institutions. It is does not differentiate between or delegate a priority of any kind (Hanseth, 2004; Walsham,1997). To analyse the actor-network, every actor or element should be treated with the same analytical vocabulary. The concept of translation focuses on the continuity of the displacements and transformation that happen in the story. Displacement happens at every stage (Callon, 1986a). Hence, translation is the mechanism of progressive temporary social orders, or the transformation from one order to another through changes in the alignment of interests in a heterogeneous network (Sarker et al., 2006). Callon (1986b) describes that the sociology of translation is composed of four moments, namely problematization, interessement, enrolment and mobilization.

Problematization

Problematization is the first moment of translation, which relates to the process of a focal actor striving to become indispensable to the other actors by defining the problem, motivating them in the network, and suggesting that the problem would be resolved if the actors negotiated the "obligatory passage point (OPP)". It is describes a product of alliances, or associations between actors by identifying what they want (Callon, 1986). OPP refers to a process in which a focal actor convinces all other actors to accept the proposal of a network. Also, it is refers to a process in which a focal actor shows an interest in all the actors who accept the proposed network.

Interessement

Interessement is the second moment of translation relates to a series of processes where a focal actor attempts to lock other actors into a position that they have been offered in the network. It is also means the group of actions by which the focal actor aims to impose and stabilise the other actors' identity. These actions are defined through the problematization process.

Enrollment

Enrolment is the third moment of translation refers to a set of strategies in which a focal actor attempts to define and inter-relate the various roles that allow other actors to enroll. The process of enrolment involves "group multilateral negotiations, trials of strength and tricks that accompany the interessements and enable them to succeed" (Callon, 1986). When the negotiation between actors has been achieved, the inscription appears. The inscription is a process of artefact creation that ensures the protection of some interests (Sarker et al., 2006). In brief, an enrolment relates to acceptance from the other actors of the interests defined by a focal actor through the process of bargaining and making concessions (Sarker et al., 2006).

Mobilization

Mobilization is the final moment of translation relates to a set of manners utilised by a focal actor to ensure that all actors have legitimate speakers to represent them in the groups, and avoid betrayal by various collectives from the latter (Callon, 1986).

RESEARCH METHODOLOGY

This study is presented in a qualitative nature and its attempt is to know the IT evaluation investment practice in local authority by following priory approach as stated by Strauss (1998), qualitative research can be seen as interpretive research. Case study method is chosen for this research. This study constructed, classified the element involves and identified the relationship in attempt to explain what has been investigated and analyzed based on ANT.

Open interview has been identified and chosen as the most suitable method in data collection as the researcher can probe for additional information and feedback as well as motivate the respondent to answer the question freely and openly. The researcher has done preliminary literature search in identifying research problem hence formulated the question based on the literature search activities conducted previously. It is essential due to the problem can be narrow down from broad area of study towards defining the issue more clearly and precisely. The main interviewee involves from two case studies are from Local Authority 1 (LA1) holds the responsible as the Head of IT Division (P1), IT Officer for Application Operation and support (P2) and IT Officer for Application Development (P3). For the second case study Local Authority 2 (LA2); the interviewee holds the position of IT officer (Q1). The interview questions were mailed to the respective interviewee to enable them to go through and prepare themselves with the question before the interview session is taken place. Instead of face to face interview, the researcher also interacts with interviewee through an e-mail in discussing in details about data collection gathered previously. Interview session with interviewee was held iteratively in ensuring in depth understanding and accuracy of data collection.

ANALYSIS FINDINGS

Case Study Organisations

Two local authorities were selected in this study to investigate the IT investment evaluation practice implemented. The selections were based on the IT projects handled and managed by both. Head of IT Division and IT Officer from Application Operation and Application Development were interviewed for data collection.

Local Authority 1 (LA 1)

LA1 started to invest in IT in 1996 when computers and other IT facilities were brought into the organization to help the management in doing their work. Since then, the spending on IT keeps on increasing from one year to another due to high workloads, current needs and demand by other departments that required them to utilize IT. The main focus was more towards gaining the satisfaction of the public who deal with the council. In the mid of 1997, LA1 took a serious investment in IT with the introduction of a new system (refer as S1) that aimed to assist the council in operating their daily jobs. However, S1 was not successful during its implementation and the expenditure was about 3.5 million and many complaints were received from the system users.

Finally, in May 2001, LA1 has decided that the non-flexible S1 was not worth to maintain and need to be replaced. A new comprehensive system, refers as System 2 (S2) was

introduced as a solution that covers almost all core functions managed by the organization. This system is considered as LA1 major system where it comprised 22 modules altogether to support almost all main functions and used by few department in LA1.

Realizing big expenditure for their new project and learning from their previous mistakes, LA1 has appointed local agency as their external consultant to help them study the weaknesses of the old system and produce a better flow of requirements for the new system as preventive steps to avoid future failure. LA1 has taken an aggressive action to prevent failure in their IT project by ensuring that every stage of system life cycle is being monitored by the appointed officers from IT division. Since then, the investment of IT projects comes from the budget that has been reserved for each department.

Local Authority 2 (LA2)

Local Authority 2 was guided by the allocation of budget dedicated by the government's five-year blueprint in planning their 5 years investment in IT. This shows that LA2 is more strategic in IT investment arrangement compared to LA1. In order to suit the government's budget with their own IT financial planning, they will then decide on which IT projects that best to be align with their five years plan and come out with their own IT strategic planning.

For the case study of LA2, an enforcement system (refer as S3) is considered as total solution that subsequently used by few departments in LA2 starting from December 2006. The idea of S3 solution began when Parking Department complained that they have insufficient man power to handle manual compounds issued by the enforcement officers of the department. The core functions are to enforce laws related to vehicles and compound management including the arrangement, payment, public complaints as well as preparation of reminder documents.

Throughout that time, compound was issued manually to the public. Having limited staff, Parking Department faces with difficulty to handle those administrative works efficiently. Realizing these issues will affect productivity of the staff, IT department has taken the initiative to outsource the solution for their enforcement administration.

Starting from this point, IT department has taken a step to open a tender to invite companies that have ability in providing the solution. The evaluation of this new solution dealt with concerns on all aspects of the requirements set for departments that used to issue different kinds of compounds. It is also considered on the integration part with other systems used in LA2.

The total solution of S3 was developed by the most experienced vendor with 2 major components; web based backend system and handheld front end system. After almost 2 years, S3 solution was acknowledge a success implementation project in LA2.

FINDINGS

Local Authority 1 (LA1)

Lacking formal IT evaluation practice with standard and rules made LA1 follows the standard provided by the state government which subject to change based on the requirement of local authority with respect to system involved. With the help of local agency, the participation of evaluation is involved by IT department, local agency and vendor. The evaluation happens during feasibility phase (project selection) and post implementation (User Acceptance Test). This is conducted in a meeting basis where every result is records in a documentation which later kept and distributed by the stakeholder. The project selection meeting is dividing into two groups which are Steering Committee (StanCo) and Morning Meeting. Different participation needed for different group of meeting due to the different objective that need to be achieved.

Throughout feasibility phase of project selection, LA1 will expose the quotation to notify vendor on the current project. The selected vendors which will be evaluated through forms that

distributed among StanCo. The evaluation is done by checking the criteria whether the vendor fulfils the criteria listed by LA1 on the form. This evaluation is more of a qualitative nature where the vendor will be evaluated through the description of their potential rather than determine by numeric value. The stakeholders involved in project selection are divided into two groups which are Evaluation Board and Technical Board. This board will evaluate the vendor from the perspective of the criteria and technical specification provided by the vendor. The selection criteria in supporting IT evaluation practice are divided into two which depends on the budget stated. For budget that greater than the amount stated, the project will be open for tender. The selection process will be similar to any local authority that bounded by government criteria. For those less, the selection is done by LA1 itself which consist of two phases; vendor selection and IT project approval. In vendor selection, the IT project is open and a letter of information will be submitted to inform the importance of the project to the organization. The tender will be choosing based on the benchmark and form. Further investigation is done to ensure the qualified vendors to avoid future risk involved. This process is followed by IT project approval meeting to approve the selected project.

Post implementation evaluation is implementing in LA1 through User Acceptance Test (UAT) in monitoring the system usage and performance. In this practice, the vendor will be ranked based on the fulfilment criteria required by user. UAT evaluation practice is conduct in UAT meeting attended by steering committee involving the system user, IT department and vendors. The outcome of the meeting is documented and disseminated to other stakeholder for reference. There is no standard practice and benchmark involve in this UAT meeting. The practice is based on comments given by system users of IT department. The changes of requirement may incurs additional cost allocated by vendors, however LA1 perform cost control action for changes of requirement by holding the payment if the vendors fail to follow user requirement and agreement.

Local Authority 2 (LA2)

Different perspective and understanding of IT evaluation practice is being implemented in LA2. The IT evaluation practice is claim by LA2 as a formal practice due to the standard documentation and forms involves during the process. The IT evaluation practice which done by LA2 consists of feasibility evaluation known as vendor selection and post implementation known as User Acceptance Test.

The feasibility evaluation (vendor selection) objective is to identify which vendor is suitable to perform the project and gives the most return to LA2. The evaluation guidelines exist since 1997 and few portions were amended to suit the evaluation practice. The vendor selection process is executed in three stages; proposal, tender amendment and decision making of IT project approval. There are benchmark and form used in this process.

The proposal stages begin from the user concerning proposal review, requirement accuracy checking, proposal meeting and final decision of proposal. The next stage; tender amendment is a stage where certain portion of the tender will be amended to suit the system specification or requirement needed. The evaluation of the vendor will be performing by the evaluation panel to determine the winner through the evaluation of company stability status and technical specification needed by the project. The final stage of feasibility evaluation involving decision making of IT project approval is then taken place to approve the selected project. The IT project selection criteria is identify as similar as LA1 which base on the budget allocated for the project and the selection will be done internally for the amount agreed and vice versa.

This feasibility evaluation is conducted through two phases of steering committee meeting known as Full Board Meeting and Morning Meeting. The different participation of the stakeholder involvement in each meeting is due to the different objectives that need to be achieved by each meeting. Documentation has played a major role in record keeping and

distribution of information from one phase to another. The documentation consists of IT Project Report, Initial IT Project Report, IT Project Evaluation Report and Financial Evaluation Report.

Similar to LA1, the post implementation evaluation is practice in LA2 through User Acceptance Test. The objectives are to monitor the system usage and to understand the acceptance of user with the system created. The implementation practice is more on system demonstration that conducted in a meeting. The UAT meeting is attended by the system user, IT department staff and vendors. In the completion of UAT process, the documentation is used and prepared by vendor.

DISCUSSION

Lack Of Formal IT Investment Evaluation Methodology In Organization.

Evaluation approach and documentation.

Both local authorities conduct IT evaluation in the organization but practice it differently even though the guideline was given by the state government. The study found that LA1 understand feasibility evaluation as project selection whereby LA2 understand feasibility evaluation as vendor selection. Project selection approach may not similar to vendor selection but both mentioned that is evaluation practice. This shows the existing in conflict of understanding about evaluation by these local authorities.

Documentation was identified as an important record keeping method and distribution of information after each meeting. The documentation practice in IT evaluation by both local authorities showed both have contradicted understanding. LA1 mentioned that having documentation cannot be considered as formal evaluation practice. However LA2 mention oppositely. From the finding, documentation practice is similar for both since the guideline comes from the same source which is the State Government. The difference is LA2 have proper structure of documentation compared to LA1 due to little changes made by the officers to suit with the practice. Even though the documentation originates from the same source, both mentioned the evaluation practice in opposite way as mentioned by Hallikainen (2006) that there are conflicts of understanding in IT investment evaluation implementation due to different culture, industrial structure and organizational size.

Organization Did Not Aware or Acknowledge On The Evaluation Methodology

The awareness of evaluation methodology means the organization understands on the idea of evaluation methodology and the implementation of evaluation methodology in the organization. This study identified LA1 confess that they do not aware on the availability of evaluation methodologies and do not know what evaluation methodology is. Any problem arise will be solve in their own way which is conducted in a meeting with the people involved. LA2 has different understanding of IT evaluation methodology when they claim an evaluation is as similar as using an evaluation methodology. However, the evaluation methodology practice is referred as having documentation and necessary forms in supporting the evaluation practice. It is found that both local authorities are neither clear nor aware of existing evaluation methodology practices. Based on misunderstanding of evaluation methodology somehow will let local authorities to reiterate the same mistake in future and lesser the opportunity to improve evaluation practice which could lead to the local authority selecting the wrong project. Without the awareness of evaluation, an organization has limitation to expose and implement a proper evaluation practice thus leads to lower benefits to the organization.

Organizations Did Not Understand On The Importance Of Evaluation In Achieving Business Objectives.

Both local authorities understood the importance of IT evaluation in achieving business objectives. However it is found that the approaches by both local authorities are different. LA1 conducted the evaluation based on needs, where else LA2 conduct the evaluation practices guided by the State Government guideline and must be followed by the vendor.

Appraisals or Evaluation of the Proposed IT Investment Projects.

An appraisal refers to the agreement agreed between local authority and the vendor. Inappropriate appraisals in vendors evaluation is identify as a contribution factor for failures in vendors evaluation. Vendors evaluation conducted by both local authorities to evaluate vendors on their capabilities in executing the system based on user needs. This study identify in LA1 that there are vendors who claimed for their high capability in produce the needed system and successfully wins the feasibility evaluation but fails in producing the system needed by user. Inappropriate appraisals conduct by LA1 had given them trouble and show the appraisal weaknesses.

LA2 on the other side claims they have a proper evaluation implementation practice. It can be summarized that both conduct feasibility evaluation as their appraisal in early evaluation for project but in a different approach during feasibility evaluation and different participant of committee involved. It can be seen that both practices aim to get the best IT project or the best vendor from feasibility evaluation.

Evaluation Measurement Instrument as A Way to Measure Evaluation Practice.

The practice of evaluation measurement to measuring IT evaluation is an issue to be raised as there are many types of evaluation measurement can be used. Neither LA1 nor LA2 has proper evaluation measurement and different implementation of evaluation measurement conducts by both .LA1 claimed they did not have evaluation measurement purposely to measure the system in numeric figure but the practice is based on description of internal system condition. LA2 on the other hand used form checklist during post implementation evaluation to confirm the system follow user requirement.

The impact motivated both local authorities to overcome the issue. LA1 improve the evaluation measurement practice by implementing Audit Department to monitor every system resource and budget flow where else LA2 did not mention to improve the practice.

Lack of Manpower

Lack of manpower was identified as a contribution factor in conducting IT evaluation and its implementation in the organization. This is due to many systems need to be handled and monitored by the staff at the same time hence ignoring the evaluation practice. Besides, there are many crucial tasks to do rather than concentrating in evaluation practice itself. Different scenario happens for LA2 as they claimed that they do not have lack of manpower issue due to the number of system monitored by LA2 is not as many as LA1. This leads them to practice a better structure of IT evaluation compared to LA1.

The ANT Perspectives

The fist moment: Problematisation

The understanding of IT evaluation investment from both local authorities is hazy because there are lacks of understanding and improper practice of evaluation. From this findings, it can be seen that the problem continually exist between human and non-human components (actants) due to poor relationship, understanding and implementation of IT investment evaluation.

The findings distinguish such problems occurs caused by the unawareness of the importance of evaluation in achieving business objectives by actors. Hence, local authorities are unable to produce proper appraisal or agreement between local authorities and vendors. The result leads to serious problems in the tendency of trapping the actors (local authorities and vendors) in the agreement. Consequently, the project is in risky situation where the uncertainty for the project to be successfully implemented is low (Keen, 2011). This is understood as serious condition as the project requires high expenditure yet it return zero values to the organization because of the problem mentioned.

From the human components perspective, the lack of manpower is seen as a problem and cause by no actions taken from the top management to hired new staff in monitoring current staff in performing their task. This will cause the maximization of staff's workloads which intent to save the cost of operation. From this situation, the shortage of manpower in the actor-network formation is also identified as a problem thus leads to improper practice of IT investment evaluation.

The second moment: Interessement

It is desirable to encourage local authorities to have a clear guideline, standard and practice in IT evaluation practice for the benefits of organization. However, for both local authorities current implementation is meeting which recorded in documentation and forms to ensure the evaluation information is keep and distribute among stakeholder. In addition, the documentation is passed over among actors as a method of communication and information transfer.

The method from these local authorities created a relationship of interest among actor-networks where the approaches able to attract actor-network to participate and related to each other. Meeting is a method where all stakeholders assembles and participate in exchanging and creating new ideas. By having a meeting, the information can be easily transferred and exchanged among actor-network. The information is then recorded and the information will remain for future use.

The third moment: Enrollment

In this study, the process of enrollment involves in implementation of power to the hierarchy of stakeholder. The power own by upper level actor (stakeholder) ensures the policy and rules to be followed by lower level actor. However, the decision made by the upper level is bounded by the rules govern by State Government.

The policy enforcement applies between actors such as project agreement, type of meeting conducted, frequency of meeting, meetings record and documentation, stakeholder involvement and budget allocated. Each of these has its own role and is important for all actors to understand and have the ability to execute the role in performing their task.

From the local authorities study above, it can be concluded that human stakeholder realize on the role take place between human and nonhuman actors in this network. This happen because of the authority and roles of power exist between them.

The fourth moment: Mobilization

The final translation which is mobilization or the spokesperson representative occurs when the local authority proposed to undergo training in "Institut Tadbir Awam" INTAN to improve their project management and evaluation practice. Besides that, the local authority also projected a solution to have an audit department which will monitor the resource and audit the performance of every department including IT division. This solution is seen by LA1 as a suitable method to evaluate IT project lifecycle of feasibility and post implementation. However this is still in planning process during the accomplishment of this study.

CONCLUSION

There are limited researches conducted in government organization focusing local authority in Malaysia. Most evaluation studies is conducted in UK and Australia (Lin et al., 2000) and not many is reported to be in Malaysia. This research has contributed in extending the knowledge (Creswell, 2011) of understanding of IT evaluation practice. Through ANT the interrelationship of socio technical aspect is analyzed. This research is significant in understanding the practices of evaluation. It is concluded from the findings that IT evaluation practice is still unclear and not understood. To understand the holistic picture of Malaysia IT evaluation behaviour in the public sector, further study is needed by extending the analysis to more local authorities.

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