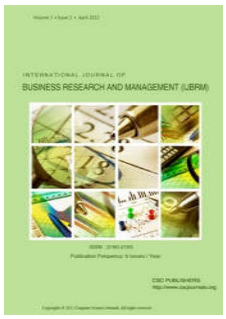

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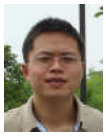

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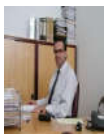

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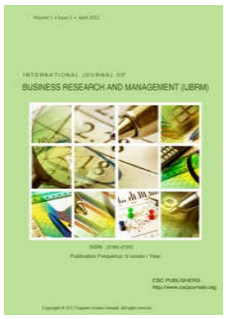

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The Adoption Of Tailor-made IT-based Accounting Systems Within Indonesian SMEs From Actor Network Theory Perspective

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ABSTRACT

This paper examines the adoption process of computer-based accounting information systems within Indonesian SMEs. The analysis was conducted using theoretical framework proposed by Slappendel [1] which is interactive process. Interactive process argues that adoption of innovation (IT in particular) should be viewed as an interactive process between individual member, organization, and its environment. One of the emerging theories within interactive process is Actor Network Theory (ANT) proposed by Latour, Callon, and Law[2-7]. ANT classified adoption process as four stages process, namely problematisation, interrestment, enrolment, and mobilization. We used qualitative approach to gather data, analyze and draw conclusion. As the result we come up with factors that influencing the adoption process along with the failure and success of such endeavour. We argues that ANT is better in explaining the adoption of IT compared to other model due its ability to identified not only the factors but also the process of adoption and explaining the success or failure of the process.

Keywords: Adoption, Computer-based AIS, Actor Network Theory, Indonesia, SMEs

1. INTRODUCTION

Small and Medium Enterprises (SMEs) arguably form a significant proportion of economic development in many countries including Indonesia [8-10]. In Indonesia, SMEs have been promoted as one of the tools to overcome the 1997 economic crisis [11]. We observed how Indonesian SMEs struggle to acquire and deploy Information Technology (IT)-based accounting systems solutions and how in some cases they have failed.

Typical adoption of innovation study such as this article used diffusion of innovation theory [12] to explain the phenomenon. Such approach have been heavily criticise due to pro innovation bias view and the tendency to focus more on factors (drivers and barriers) instead of the adoption process itself [13, 14]. We used Actor Network Theory [3, 7, 15] to explain the adoption of IT-based accounting systems due to its ability to explain the adoption phenomenon as an interactive process between organisations and its environment rather than focusing on individual factors that may affecting the adoption [1, 16].

We have been intrigued by the adoption of computer-based accounting information systems by some of Indonesian SMEs. Some of them succeed quiet well and yet some of them failed miserably. Some of them invested their IT budget wisely, while others became victims to irresponsible vendors.

The qualitative approach is deemed appropriate for this study since the use of a process-based perspective required a thorough analysis and understanding of the IT-based accounting systems adoption process [1, 17]. The qualitative approach with semi-structured interviews allowed us to explore in depth all the factors and the interaction of all stakeholders within an IT-based accounting systems adoption process [18-20]. We actually found the success and failure theme while we were analysing the data. Constant comparison based on grounded theory was conducted [21, 22]. We found pattern emerged that deemed important to be analysed and explored further.

On the next sections we will discuss the theoretical based of our study along with the methodology justification. We also reveal our respondents profile continued by our findings. At the end we present our conclusions along with possible future works.

2. ADOPTION OF IT WITHIN SMES

Studies of the adoption of IT can be considered as originating from the study of the diffusion of innovation (DOI) and more specifically diffusion of IT innovation [12, 14]. Within this paper, we shall consider three different terminologies: *diffusion, adoption*, and *IT innovation*. The notion of diffusion is often associated with the effort to spread innovation to a greater audience using communication channels, while adoption is often associated with the decision to accept and use the innovation [12, 23-26]. Innovation is associated with something new, such as ideas, artefacts or products [12]. In this paper new systems introduced into the organisation are considered as an innovation.

2.1. Definition of adoption

Basically there are three different definitions of adoption of innovation. The first refers to the Diffusion of Innovation (DOI) theory [12], in which adoption means decision to make physical acquisition of technical artefacts or a commitment to implement innovation with the emphasis being on the decision to adopt [27, 28]. The commitment to use the innovation is the result of a decision to make full use of an innovation or adoption [12]. Rogers's diffusion of innovation theory was drawn mainly from communication theory. Accordingly, its main idea was concerned with the process of communicating the idea of innovation to the potential adopters. The main objective is to convey the innovation message and encourage the potential adopters to accept the innovation. Adoption would be achieved in the adopter's mind and it is not important how the innovation is actually put into use by the adopter.

The second definition of adoption is from the works of Thong and Yap [29], where adoption of IT is defined as using IT to support business. This definition has similarities with the third definition of IT adoption, which is using innovations as intended by the designer [23]. The difference is that Bøving and Bødker [23] argued that modification of an innovation by a user in practice or by re-invention [12] was not supported by their findings, therefore it was concluded that not all use of innovation was equal and could be called adoption. Only a full use of innovation as intended by the designer without reinvention can be called adoption. On the other hand Thong and Yap [29] did not differentiate between full use and modified use of IT in their studies. Still, these two definitions argue that unless the innovation is put to use, it is not an adoption. This argument is in line with Zaltman et.al. [26], Damanpour [30], and Damanpour and Evan [31]; they considered a new idea as innovation when implemented.

Zaltman et.al. [26] divided the innovation adoption process into initiation and implementation stages. Palen and Grudin [32] furthermore supported this distinction by using the term adoption for the decision to begin using a technology and using the term deployment for making the technology available. For innovation adoption, in this paper, we argue that the definition of adoption should include the implementation stage. IT-based systems as innovation are not only ideas but also include artefacts. It is not enough that the use of IT-based system is only accepted or decided upon without any physical implementation. Rogers [12] noted that all activities until the decision is made to adopt innovation were mental activities and the implementation of the innovation required physical activities.

2.2. Interactive process perspective of adoption

There are three different approaches to study adoption of innovations, which are individualist, structuralist, and interactive process [1, 16, 17]. Individualist and structuralist approaches are focusing on individual actors and organizations as unit of study. Accordingly, the focus of studies is mainly on factors such as individual characteristics, size of organizations, leader's characteristics, and the structure of organizations. In real life, those factors are not sitting in a container and staying still, there are evidence of interactions between individuals, organizations, and their environment. Interactive approach, on the other hand, offers a more comprehensive view which covers the interactions.

It can be said that interactive processes offer more comprehensive perspectives of innovation within organisations. Individuals' actions and the structure of an organisation would determine the adoption of innovation. The interactive process acknowledges that individuals might act within the organisation and its structure, yet at the same time organisational characteristics and its environment would influence the individual's actions. Adoption of innovation is a process which involves the individual, the organisation, the environment, and the interactions between them [1]. Palen and Grudin [32]

investigated the adoption and deployment of calendaring application within organisation. The organisation deployed the calendar application and the process of individuals using the calendar began. Palen and Grudin called this discretionary adoption. Within interactive process perspectives, Actor Network Theory (ANT) is one of the emerging theories that attempts to explain adoption of innovation as a result of interaction process [33-35].

2.3. Actor Network Theory

ANT is often accredited as the work of Michel Callon, Bruno Latour, and John Law [2-5, 34-38]. ANT deals with [39]:

> *"… progressive constitution of a network in which both human and non-human actors assume identities according to prevailing strategies of interaction. Actors' identities and qualities are defined during negotiations between representatives of human and non-human actors. The most important of these negotiations is 'translation', a multi faced interaction in which actors: construct common definitions and meanings, define representatives, co-opt each other in the pursuit of individual and collective objectives."*

The translation process consist of four stages [2]:

1. ***Problematisation***. Key actors attempt to define the problem and roles of other actors to fit the proposed solution, which was made by the key actors. Key actors proposed solutions to the problems [40]. The key actors persuade the other actors that they all have the same interest and the answer to the problems is in the solutions proposed by key actors [7, 34]. The desired result would be the other actors would accept a set of specific conventions, rules, assumptions, and ways of operating defined by heterogeneous engineers which ultimately resulted in the formation of network [4, 5].

2. ***Interresment***. Processes that attempt to impose the identities and roles defined in problematisation on other actors. The key actors and other actors enrolled in the new created network try to lock other non enrolling actors. They gradually dissolve the existing networks and replacing them with new networks created by the enrolling actors [34, 35]. The enrolling actors try to stabilise the new identities for the other actors.

3. ***Enrolment***. A process where one set of actors (key actors) imposes their will on others. The other actors will be persuaded to follow the identities and roles defined by the key actors. This will then lead to the establishment of a stable network of alliances. The enrolment process includes among other things coercion, seduction, and voluntary participation [33].

4. ***Mobilisation***. This is where the proposed solutions gain wider acceptance. The network would grow larger with the involvement of other parties that were not involved previously. This growth is due to the influence of actors.

When using ANT to investigate IT adoption, a researcher would focus on issues such as network formation, human and non-human actors, alliance, and network build up [34, 38]. Stronger alliances would be likely to influence the decision to adopt or reject IT. In conclusion, ANT recognises that adoption of innovation is initiated by individuals who build a network of individuals (in the form of an organisation) and nonhumans (machine, tools, etc.) to adopt innovations. ANT is different from DOI in several ways:

- It breaks the communication into stages (of translation).
- It considers the details of "resistance" (anti-program).
- It treats non-humans as actors.
- It explains success and failure with the same model.

ANT was originally developed to explain the diffusion of science into society [for example the idea of pasteurisation in 5]. It is similar to Rogers's DOI. The difference is that Rogers's DOI viewed the adoption as merely a communication process, while ANT viewed adoption of innovation as involving a political game where an actor (who wants to spread the innovation) builds a network that will use the innovation.

Some other examples are the works of McMaster [13, 33] and Tatnall ([34, 35]. In those studies, the process of translation was believed to be richer and deeper in that it acknowledged the intertwining and inseparability of technical and social issues.

ANT is an example of a theory to explain how different stakeholders in an organisation try to spread their ideas to the other stakeholders and influence them to accept the ideas. From the ANT perspective, an actor would build a network of power to overcome other networks of power so he or she could win and impose their ideas [6, 15, 36]. At the end, the actors would use the network to achieve their own goals. In the context of adoption of innovation, the ANT perspective could be used to show how different actors spread their ideas (innovation) to be adopted by others through the development of a network [13, 14, 33]. When their ideas (innovation) are accepted by the other stakeholders (the development of a network), the actor could use the network to achieve his or her own goals. Non human actors could be 'act" in different way than intended or imposed by the key actors. Latour [5, 6] has shown how the Aramis failed to perform so it caused the abandonment of mass rapid transit project in Paris or how bacteria have been conquered by Pasteurization so it caused the jettison of Louis Pasteur into scientific stardom to show the role of non human actors.

In this light of ANT process, we will identify the actors and network they build, along with the process of network development (translation). We will draw from participants' own account of their adoption experience to explain the process. We mapped the participants' experiences into the translation's stages. We could also explain the success and failure of adoption using ANT.

2.4. Success and failure

Rogers [12] believed that adoption of innovation is about accepting the innovation, not whether the innovation works. With IT adoption, it is different since an IT solution often must be tailored to each SME. We would not necessarily say it was "adopted" until it was in use – (i.e. it had succeeded). Failure might be a combination of when the idea for IT is accepted, but the implementation is not. The acceptance of an innovation (in this article the innovation is IT) could be associated with the success of IS and rejection could be associated with failure of IS. This view is also supported by ANT, where ANT explains the success or failure of adoption of innovation is based on the interaction between networks.

IT adoption process could result in either IT being accepted and used to support the business (which might lead to further adoptions) or rejected [12]. The acceptance and usage of IT is often associated with the success and failure of implementation of IT as part of an Information System [41-43]. Adoption of IT could be closely associated with the success or failure of the initial implementation. On the other hand, the failure might be a slow process. The technology might seem to work well in the early stages, but then it may fail [44]. We are interested in the assessment of failure or success in the early stages of implementation, because the flaw (which may lead to failure in the later stage) might be detected and fixed, which may be able to prevent the ultimate failure.

2.4.1. IS Success

The concept of IS success is problematic and can be interpreted in different ways [45]. For example, Brabander and Thiers [46] defined IS success as related to the efficiency of the IS itself in meeting the requirements. IS success is also often associated with the benefits gained from the IS compared to the cost to acquire the IS [47]. However, cost–benefit analysis to measure IS success is difficult and previous studies were inconclusive in providing definitive evidence of benefits arising from IS or IT investment [48, 49]. Other measurements of IS success are related to its effectiveness, which is associated with the IS contribution toward achieving the organisation's goals and performance [50, 51]. However, measuring the impact of IS on organisational performance is also problematic, since it is difficult to isolate the impact of IS from other factors influencing organisational performance [43, 52].

In order to measure IS success, two surrogate measures in the form of two variables are often used: computer utilisation and user satisfaction [41, 42, 52]. Computer utilisation refers to the actual use of computers within organisation, which is shown by the frequency and length of use [42]. User satisfaction, according to some authors such as Raymond [41], emphasises factors that contribute to user satisfaction, including whether the applications were developed internally, usage of administrative applications, whether applications are interactive, the presence of high ranking MIS functions, and whether the organisation is situated in a less remote region. DeLone [42], on the other hand, argues that user satisfaction is shown by the actual usage of the applications by the user.

Looking at the different definitions and measures of IS success, we need to formulate a way to measure IS success. In this article, IS success is measured by:

- Computer usage by looking at the actual usage of computer (e.g. what the computer is used for, by whom, etc)
- Impact on the business measured by number of applications in used, perceived application importance, and perceived application success.

2.4.2. IS Failure

While most studies in IS success are interested in defining or measuring the success itself, there are also studies in IS failure that usually looked for factors or causes of the failure. Information systems (IS) failures have been documented extensively in the literature. Research literature in recent years has attempted to explain the reasons for and the impacts of an IS failure within organisations [eg. 53, 54, 55]. The problem with this type of research about IS failure is that it focuses mainly on the reasons for and impacts of the failure and little is revealed about what the organizations did to recover after the failure. Furthermore, most studies were conducted on larger corporations and only very few for SMEs [e.g. 56]. Arguably, the impact of IS failure within SMEs could be as significant as within larger companies or sometimes even worse due to the SMEs' limited resources [57, 58]. Accordingly, action taken after an IS failure could be a critical point for SMEs.

IS failure is a complex phenomenon that is difficult to define. There have been a number of efforts to adequately define the concept of IS failure since 1970 [53]. The term IS failure itself is often influenced by the perception of people who are involved in it [54, 59-61]. While one group of researchers perceive the notion of "failure" in IS as termination of a project due to an unbearable accumulation of flaws, others consider failure as the inability of an IS to meet its stakeholders' expectations [53]. A flaw is a condition that if accumulated might cause the system to fail, but it can be corrected at the later stage at a cost or accepted at a cost [53]. Accordingly, different organisations will behave differently when coping with IS failure within their organisations. Many of the definitions of IS failure assume that technology is neutral and unproblematic [62] as stated by one summary that defined IS failure as [63]:

> *'System failure is constituted by the system not working properly: it does not perform as expected, it is not operational at the specified time and it cannot be used in the way intended'.*

This definition, however, does not portray the full complexity of IS failure as a combination of technology and social issues.

Two approaches related IS failure to the social and organisational context [53], namely the concept of "*expectation failure*" [64] that was later broadened by Lyytinen [65] to distinguish between "*development failure*", and "*useage failure"* with the concept of "*termination failure*" [66].

Lyytinen and Hirschheim [64] identified four major categories of IS failure. Lyytinen [65] argued that stakeholder groups might recognise failure in either the development or the use phase. In the development phase, the stakeholders try to fit the IS development process to their interests, while in the use phase the stakeholders endeavour to align the IS with their ongoing concerns. Ewusi-Mensah and Przasnyski [67], while supporting Lyytinen's idea, argued that IS failure is better defined as failure in IS usage or operation, whereas failure in the development of IS should be called project abandonment. The project abandonment itself can be categorised into three different types:

- *Total abandonment* is where all project activities are terminated completely before implementation.
- *Substantial abandonment* is where major modification occurs to the project that makes it significantly different from the original specification before implementation.
- *Partial abandonment* is where the original specification is reduced without resulting in major changes before implementation.

Sauer [66] portrays IS development as an interaction of project organisation, supporters and IS arranged in a triangle shape. The project organisation depends on its supporters for the

provision of support. Supporters depend on IS for benefits, and IS depends on the effort and expertise of the project organisation to sustain it. In this model, the IS development process is open to flaws, defined as an undesired problem that needs to be solved. The flaws need to be corrected within an acceptable cost range. When flaws are not adequately dealt with, they might reduce the capacity of the IS to serve its supporters and might introduce new flaws into the systems. At some stage the accumulation of flaws might trigger a decision to stop support and terminate the project. Accordingly, IS cannot be deemed a failure until the development or operation ceases and the supporters are dissatisfied because the IS no longer serves their interests. This is what Sauer referred to as termination failure.

Sauer's definition of IS failure is somehow narrower than Lyytinen and Hirschheim's that the failure is caused by an unbearable accumulation of flaws as a result of interactions between the three components of Sauer's model. Even with a tolerable accumulation of flaws, IS failure still can occur when environment variables such as unfavourable government regulations or economic conditions influence the triangle interactions. Lyytinen and Hirschheim's definition on the other hand provides a wider understanding of IS failure.

The literature has shown the different definitions of failure and the stages where failures might occur [64-66, 68]. However, there is little coverage of how an organisation copes and recovers from failures, especially for SMEs. Failures in IS could have a considerable effect on SMEs due to their lack of resources. We believe that the issues of IS success and failure as the end result of IT adoption process and how the SMEs cope and recover from such failure need to be explored further.

3. RESEARCH METHOD

IT adoption within SMEs is a complex socio-technical phenomenon [1, 12-14]. SMEs consist of individuals and other resources that interact with each other in their daily operations. By introducing an innovation (in this case IT) the interaction both within an SME and between the SME and its environment will change. Such complexity needs to be explored in its fullness. Any effort to reduce such complexity into mere numbers and figures could obscure the real picture. A quantitative approach using tools such as surveys was considered but not adopted since the use of a survey tends to prejudge the outcome beforehand. In the end, the quantitative approach will either accept or reject the hypothesis. Instead of making an educated guess at the outcome, the qualitative approach used in this study will explore the phenomena. The outcome should provide a more complete picture drawn from the data collected by semi-structured interviews.

As discussed in the previous section, the qualitative approach allows the researcher to study the phenomenon in its context and with all its complexity [69]. It enables the adoption of IT within SMEs to be explored beyond just the factors influencing IT adoption by Indonesian SMEs and also allows an investigation of the complexity of adoption process experienced by Indonesian SMEs.

Establishing the research approach used in this study also establishes the selection of methods and tools to collect and analyse the data from research participants. As it is the intention of a qualitative research to study the phenomenon in its context, the methods used has to enable interaction with the research participants [19, 69]. In this study, the data comes from the participants' experience in adopting IT for their organisation. One method of collecting such data is the interview, which may be structured, semi-structured, or unstructured [18, 69-71]. A structured interview provides a set of questions prepared by the researcher and the participants are required to give answers to those questions [69, 70]. In a way, it is similar to delivering a survey orally and the data collector filling in the survey rather than asking the participants to fill the survey. Unstructured interviews do not have any detailed guidance on how the topic should be explored [69, 70]. The unstructured interview could get carried away from the main research topic and might not capture the required data. Therefore, the semi-structured interview with open-ended questions is selected as the method to collect data for this study. The semi-structured interview allows the researcher to explore participants' experiences of IT adoption and to focus on the main issues, yet at the same time allows the interviewer to explore participants' responses further or to clarify issues emerging during the interview [69, 70].

Once the data is collected, content analysis can be used as an analysis tool. Content analysis is used to identify patterns and themes within the data [69, 72, 73]. From the analysis, stages of the adoption of IT within the participant's organisation can be identified, along with other relevant information that may be important but does not directly relate to the adoption of IT. We mapped the result to 4 stages of ANT's translations.

4. PARTICIPANTS PROFILE

The participants were selected from a list of Indonesian SMEs in the furniture and handicraft industry and situated in the Yogyakarta and Surakarta regions in Central Java. The list was compiled from data provided by the Indonesian Yellow Pages and the Indonesian SMEs association (ASMINDO). The furniture and handicrafts industries were chosen because they are not obviously IT intensive. These SMEs usually do not have a dedicated IT department, yet they need to use IT in their day-to-day operations.

The chosen (adjacent) regions of Central Java are considered one of the main centres for furniture and handicrafts in Indonesia. As all the SMEs are from the same region, they face similar business environments (transportation, raw materials sources, export markets, etc.) We had been working with various SMEs prior to this research project as an IT consultant. Some of the SMEs we have been working in the past were in the furniture and handicrafts industry. Therefore, it was easier to initiate contact and invite the participants since we were known to them.

We managed to secure participations from more than 55 SMEs. However, only 12 are included for the purpose of this article since the rest were only using office package for general purpose and graphical design package for product design purpose. We assign R#, where # is sequential number as code for participants. We would like to protect participants' privacy and anonymity. Table 1 shows the profile of our participants with its original codes.

Participants	Developer	Status	Type of Apps.	Key Actor(s)
R01	Internal, Bespoken	Failed	Inventory and employee attendance	Manager
R02	External, Bespoken	Failed	Inventory	Manager/owner
R03	External, COTS	Failed	ERP	Owner & Vendor
R04	External, Bespoken	Failed	Accounting Package	Manager/owner
R05	External, Bespoken	Failed	Order/Sales Entry	Manager
R06	External, Bespoken	Failed	Order/Sales Entry	Owner/Vendor
R07	External, Bespoken	Failed	Accounting Package	Manager
R08	Internal, Bespoken	Succeed	Accounting Package	Manager & Staff
R09	Internal, Bespoken	Succeed	Accounting Package	Manager & Staff
R10	Internal, Bespoken	Succeed	Accounting Package	Manager
R11	External, Bespoken	Succeed	Inventory	Manager/Owner
R12	External, Bespoken	Succeed	Order/Sales Entry	Manager/Owner & Staff

Table 1. Participants' profile

External developer means that the system was built by external parties, while internal means the opposite. Failed means that the system was either failed to be finished or finished but abandoned [53, 62, 74]. Succeed means that the system was used as initially intended [42, 45]. Actor refers to the initial individual/parties who had the idea and initiate the adoption process. We differentiate manager from owner since the owner might be the manager or they would hire somebody else to run their business. Type of application refers to the software used to manage accounting systems. It was ranging from inventory management to full accounting package and even an ERP system. We also differentiate commercial-off-the-shelf to bespoken system, although only one using COTS systems.

5. TRANSLATION PROCESS

In this section, we will map the participants' experience to the stages of translation [2, 3]. Along the way, we will also present some quotes from our participants[1].

5.1. Problematisation

Key actors attempt to define the problem and roles of other actors to fit the proposed solution, which was made by the key actors. Problematisation means the actor who initiates adoption effort saw problems with their old system or opportunities for offering new system. The key actors also would like to see other actors subscribe to their view.

All but R03 and R06 had only internal key actors who initiated the system development effort. In R03 case, ERP consultant approached the owner to build their own ERP systems guided by the consultant. All the key actors (manager/owner, manager, staff, and vendor) perceived that the organisation have problems with their current accounting systems.

> *"We need more accurate inventory reports" R01 manager/owner*
>
> *"We need to integrate and share our accounting information" R03 manager*

The key actors then persuaded other to start adopting desired solutions which was building a new accounting system. The position as manager or owner certainly was favourable for the key actors to impose their proposal. The key actors would like to impose a set of new rules, assumptions, conventions, and operating procedure in form of a new accounting system.

> *"We want to be able to manage our production process from material requisition to sales." R03 manager*
>
> *"We want to reduce error in the administrative area" R02 manager/owner*

Yet, as seen in table 1, it did not necessarily translated into success or acceptance by the others.

5.2. Interresement

Processes that attempt to impose the identities and roles defined in problematisation on other actors.

In this stage, key actors then assigned other actors to start the development of new accounting systems. Key actors in seven participants[2] (R02, R04, R05, R06, R07, R11, and R12) have to bring external actors to develop the accounting systems since nobody within their organisation able or deemed able to assume the role of systems developer.

> *"I hired a programmer who happen to be my old colleague while I was working for a computer store" R11 manager/owner*

Others were utilising internal actors and even themselves as developer.

> *"I developed the new system myself" R01 manager*
>
> *"One of our staff have adequate programming skills to develop the application" R09 manager*

[1] The actual interviews were in Indonesian and Javanese language. The excerpts are translated and presented in English by the author.

[2] R03 is excluded since the origin of the new system development was from external parties in form of COTS. It was only natural that the developer would be external.

In this stage, non human actors in form of computers and applications are brought in to form a new network. The new network in this context is the new accounting systems. Key actors rallied other actors (human and non human) to form set of procedure and applications to manage accounting data.

> *"I did all the purchase, setup, and installation" R10 manager*
>
> *"The staff required computers to perform their duties" R08 manager/owner*

5.3. Enrolment

A process where one set of actors (including key actors) imposes their will on others. The other actors will be persuaded to follow the identities and roles defined by the key actors. This will then lead to the establishment of a stable network of alliances.

Once the network started to form, the key actors rallied support from other non enrolling actors. All enrolling actors made attempts to entice non enrolling actors to join the new network. The enrolling human actors would made attempts using communications channel.

> *"We started with the marketing department which need sales applications; we hoped that the other would see the benefit." R12 manager*

Enrolling non human actors in successfully doing what they intended to do, would demonstrate the "positive" aspects of the new network. Ultimately success or failure of the accounting systems would determine if the stabilisation of network formed. The failure of non human actors to perform had negative effects to the network formation. Non enrolling actors did not want to join the network due to the failure.

> *"The inventory system shown negative balance, I think the programmers were incapable!" R02 owner/manager.*
>
> *"The application build was not suitable for our business process, we had to made too many adjustments which were not desirable" R03 manager*

5.4. Mobilisation

This is where the proposed solutions gain wider acceptance. The network would grow larger with the involvement of other parties that were not involved previously. This growth is due to the influence of actors. The accounting system, either in development process or finished product, was accepted as sole solutions to the problems. The key success factors in this stage is two which are:

- Wide acceptance from other actors, especially non enrolling human actors.
- The ability of non human actors and enrolling human actors to perform their pre defined roles as intended. In other words, the accounting system is demonstrating its capabilities to solve the problems.

It is need to be noted that on R03 case, the ERP project eventually failed. However, the owner/manager have seen and convinced the benefit of an integrated accounting system (much like the doomed ERP project). The owner then hired the ERP consultant to be permanent employee and oversee the development of new accounting systems. The system was developed by internal staff from scratch which seemed suitable for the company.

6. DISCUSSION

Actor Network Theory with its four stages of translations arguably could better explain the adoption of IT-based accounting systems [13, 14, 34, 40]. By looking at the adoption process through translation, we could identify actors (both human and non-human). We also could observe how their action (or inaction) could lead to the successful or failure of adoption.

The key actors who initiated the development of new accounting systems mostly involved directly with the organisations' daily operations. R04 have external key actors. Yet the external actors able to rallied another key actors (the owner/manager) to subscribe to the idea. Although the key actors mostly a person with the highest possible authority in the organisation, it does not guarantee acceptance.

To gain acceptance, the new accounting systems need to be developed. In order to develop the accounting systems, the key actors rallied the assistance of other actors. It might be external developers (R01, R04, R05, R06, R07, R08, and R11) or internal developers and even themselves (R02, R03, R09, and 10). The key actors also include non human actors in form of computers and accounting systems applications. The key actors and their allies then try to entice non-enrolling human actors to join the network, which means accepting and using the accounting system.

The key success factors for non human actors are two. The first factor is wide acceptance from other actors, especially non enrolling human actors. The second factor is the ability of non human actors and enrolling human actors to perform their pre-defined roles as intended. In other words, the accounting system is demonstrating its capabilities to solve the problems.

R01, R02, R03, R04, R05, R06, and R07 were failed due to the inability of the accounting systems to accomplish their goals. All three accounting systems failed to functions properly. R02's inventory applications showed negative balance. R03 failed to deliver ERP systems. R07 simply failed to develop a standard accounting system.

R01, R05, and R06 failed to entice non enrolling human actors to join the network. R01 manager failed to convince other to use his inventory and time attendance recording system. The employee went to the owner and the owner veto the application. R06 and R07 were similar. The staff could not use the application even though they have been intensively trained. R06 cited the lack of discipline to use the accounting application, while R07 cited the lack of English language skills made them unable to use the order entry processing systems. R07's system was designed to handle overseas order, so English language skills were essentials.

7. CONCLUSIONS

We have demonstrated in this article how Actor Network Theory could provide a better picture on adoption of bespoke IT-based accounting systems within Indonesian SMEs. Conventional adoption of innovation research would focus more on drivers and barriers and the characteristics of innovations. Actor Network Theory provides a view where the adoption is a social process. A process where key actors try to impose their view on the problems and their version of the solutions to toher actors by building a network of human and non human actors. The network was in form of IT-based accounting systems where a set of roles, rules, and procedures was implemented. Actor Network Theory also looks at the success and failure of such endeavour.

The network formation will be success if the key actors could entice other actors either human or non human to join their new network. By forming new networks (new accounting system), the alliance dissolves the old network (the old accounting system). Non human actors need to perform their intended duties, otherwise the new network will crumble and failed to form. Some might say that the human actors responsible for making non human actors to perform yet we could see from time to time that for some reason a computer and its applications simply does not work. The fact was the system failed to perform and the network failed to gain wider acceptance.

The study was conducted using organisation as unit of study. Therefore the dynamic shown are on organisational level. We could gather more fact if we also looking at individual level. We also only interviewed key actors. We did not look at non key actors especially the external developers and non human actors. We might get a better understanding on what went wrong (or what went right for that matter) if we could study the failure of non human actors performance.

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