Infusion of e-procurement at Indonesian local government

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Abstract

This study examines information system (IS) Infusion Model of e-Procurement at the municipal government of Bengkulu. This study used 68 self-administered e-procurement's questionnaire. The data was further examined using Partial Least Square (PLS) tool. The results show that the opportunity appraisal, threat appraisal, and secondary appraisal have important role in improving the problem-focused adaptation and emotion-focused adaptation. However, only opportunity appraisals have significant role in promoting problem-focused adaptation. Also, only problem-focused adaptation predicts IS infusion. Implication for stakeholder and further research are discussed.

Keywords: problem-focus adaptation, emotion-focus adaptation, IS infusion, e-procurement, SPSE, local government.

1. Introduction

Electronic government (e-Government) system has several advantages in the process of implementing transparent, efficient, and effective public services. Government-based information technology (IT) system, presumably provides affordable services and expands the access to information easily for the community. One of the Indonesian government's efforts to create the public transparency is through President's Instruction (*Inpres*) No. 3/2003 regarding Policies and National Strategies Development of e-Government practice. The actual example of e-government itself is the electronic procurement (e-procurement).

The implementation of e-procurement begins with the issuance of Presidential Regulation No. 106/2007 about the Establishment of Government Procurement Policy Institution (EGPPI) which develops and formulates government procurement policies. The concrete manifestation of such good practice is the Regulation of EGPPI No. 2/2010 about Electronic Procurement Services which conveys that Local Government shall establish an e-Procurement system (LGEP) to facilitate Procurement Officer (PO) in implementing electronic procurement.

Moreover, the high corruption cases around Goods and Services Procurement (GSP) of government institutions motivate the importance of e-procurement. Indonesia Procurement Watch states that 70 percent of the total corruption cases are sourced from the GSP domain, both at the central and regional levels. The variation of cases is comprised of bribery, procurement of goods and services in the state administration, misuse of budgets and levies in public services, and licensing and money laundering cases (Corruption Eradication

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Commission (CEC), 2017) (see Table 1).

Table 1. The data of corruption by type and year 2004-2017 (March 31, 2017)

Cases	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Procurement	2	12	8	14	18	16	16	10	8	9	15	14	14	7
Licensing	0	0	5	1	3	1	0	0	0	3	5	1	1	1
Bribery	0	7	2	4	13	12	19	25	34	50	20	38	79	16
Charges	0	0	7	2	3	0	0	0	0	1	6	1	1	0
Misappropriation of budget	0	0	5	3	10	8	5	4	3	0	4	2	1	1
Money laundering	0	0	0	0	0	0	0	0	2	7	5	1	3	2
Blocking the KPK process	0	0	0	0	0	0	0	0	2	0	3	0	0	0
Amount	2	19	27	24	47	37	40	39	49	70	58	57	99	27

Source: Anti Corruption Clearing House (ACCH)-CEC (May 30, 2017)

In addition, the Indonesian Corruption Watch (ICW) conducted a study by employing Potential Fraud Analysis (PFA) method. Their findings reveal that there are high possibilities of potential fraud at the Local government level. Take, for instance, Bengkulu Province is reported in the first rank (15.4 points), South Sumatera (15.1 points) in the second rank (www.pedomanbengkulu.com, 2017). Therefore, it is important to investigate e-procurement implementation at the local government level.

The implementation of a reliable e-procurement system must fulfill six pillars; people, process, technology, strategy, governance and organizational interface. Unfortunately, the development of human resource competencies at the Indonesian local government is not as extensive as technology and rules (CEC, 2017). Moreover, the digital divide issues become the main challenge in the infusion of e-procurement (Nightisabha, 2010), such as unwished IS usage (Jogiyanto and Abdillah, 2011). Therefore, it needs guidance in using IS, such as ability to adapt an IT events (Tyre and Orlikowski, 1994; Orlikowski, 1996; Beaudry and Pinsonneault, 2005; Fadel, 2012). Coping Theory is considered as a relevant concept to explain user behavior and adaptation outcomes. The conceptual model is called Coping Models of User Adaptation or CMUA (Beaudry and Pinsonneault, 2005; Lazarus and Folkman, 1984).

The previous empirical studies have examined the CMUA model (Fadel, 2012; Sigalotang et al., 2014; Astriana et al., 2015). However, there are limited studies examining the CMUA model in the context of local government institution. The CMUA model is deemed relevant to being re-examined in the context of the use of similar mandatory systems, such as in e-procurement systems. Thus, it is important to investigate e-procurement implementation by Indonesian local government using the CMUA model.

2. Theoretical development

The fundamental premise of CMUA is the introduction of a technology or a modification of an existing technology that can bring the perception of new changes (Louis and Sutton, 1991) and improve disturbances in the organizations (Lyytinen and Rose, 2003). By defining user adaptation as a coping problem, it can be learned various kinds of user responses including how users can restore emotional stability, modify tasks, reinvest, and adapt technology, or even reject it.

The process of coping can be done through two processes that constantly affect each other (Lazarus and Folkman, 1984). Both processes include process of assessing the consequences of an event that will result in a primary appraisal. Furthermore, individuals will take different actions to address the situation based on the results of the appraisal, called coping efforts. Individuals incline to combine the cognitive and behavioral efforts, both of which are also categorized as problem-focused or emotion-focused (Folkman, 1992; Lazarus and Folkman, 1984; Stone et al., 1992).

Opportunity appraisal is an appraisal of perceived IT events to have positive consequences. While problem-focused adaptation is directed to handle issues related to IT activities directly by adapting themselves, adapting their work, and adapting the technology. Furthermore, emotion-focused adaptations are oriented towards oneself and lead to a change in one's perceptions resulting from the consequences of an IT event or to reduce emotional tension.

The CMUA model implies that an IT event assessed as an opportunity tends to effect on problem-focused adaptation and emotion-focused adaptation behavior (Beaudry and Pinsonneault, 2005). Primary appraisal is a situation where the consequences perceived from technological event information rated as an opportunity, effects on benefits satisficing, which are the less adaptation problem-focused efforts were minimal and limited (Lazarus and Folkman, 1984). Challenge appraisal which is also a characteristic of positive judgment has a significant effect on problem-focused and emotion-focused adaptation (Fadel, 2012). Thus, Hypothesis 1 and Hypothesis 2 are developed as follows:

H1: Opportunity appraisal has a positive effect on problem-focused adaptation.
H2: Opportunity appraisal has a positive effect on emotion-focused adaptation.

Threat appraisal is an appraisal of IT events which is perceived to have negative consequences. Based on the CMUA model, Beaudry and Pinsonneault (2005) also concluded that when individuals assess the event of IT as a threat, their efforts will be largely oriented to reduce emotional distress and reduce the perceived negative consequences associated with the event. Thus, this research formulates Hypothesis 3 and Hypothesis 4 as follows:

H3: Threat appraisal has a negative effect on problem-focused adaptation.
H4: Threat appraisal has a positive effect on emotion-focused adaptation.

Secondary appraisal is the users' appraisal on how much control they have on IT event options for their adaptation to the specific resources that are available to them. In coping study, it shows that problem-focused adaptation attempts to affect when an individual feels that he or she can do something to change his or her situation, while emotionally focused adaptation has shown an effect when individual feel he or she has little or no control (Beaudry and Pinsonneault, 2005). This is what underlies Hypothesis 5 and Hypothesis 6 proposed as follows:

H5 : Secondary appraisal has a positive effect on problem-focused adaptation.
H6 : Secondary appraisal has a negative effect on emotion-focused adaptation.

Problem-focused adaptation is directed to address the issues related to IT events by adapting themselves, their work, and IT. The CMUA model predicts that users with problem-focused adaptations will be more easily achieving the effective and efficient results in the IS utilization. The empirical evidence of Fadel (2012) supports the model and find problem-focused adaptation behavior to be a single strong predictor of IS infusion. This is in line with the empirical results by Sigalotang et al. (2014) which found a significant positive effect of problem-focused adaptation on IS infusion. Thus, this research proposes Hypothesis 7 as follows:

H7: Problem-focused adaptation effects IS infusion.

Emotionally focused adaptation orients toward individual itself and leads to changes in one's perception as a result of the consequences of the IT event to reduce emotional tension. Emotion-focused adaptations minimize consequences of IT events, selective attention, positive comparisons (Lazarus and Folkman, 1984), and passive acceptance (Tyre and Orlikowski, 1994). Empirical results of Sigalotang et al. (2014) found positive effect of emotion-focused adaptation on IS infusion. Thus, Hypothesis 8 is formulated as follows:

H8: Emotionally focused adaptation has positive effect on IS infusion.

Figure 1. presents the proposed empirical model tested in this study.

Figure 1. Research model
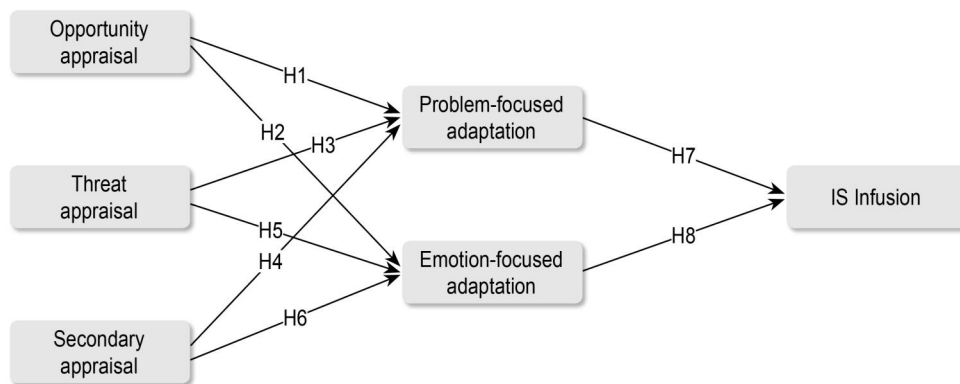
Source: The proposed model is adapted from Beaudry and Pinsonneault (2005), Fadel (2011), Fadel (2012) and Astriana et al. (2015).

3. Methods

This research is quantitative with survey questionnaire as the instrument of data collection. The measurement of opportunity appraisal uses five items of metrics (namely perception of opportunity to reduce stress, feeling gain, to increase information quality, to change better, and opportunity to improve knowledge about government system). Threat Appraisal uses five items of metrics (namely perception of worst, bad performance, feeling loss, feeling worry, and negative impact of e-procurement). Secondary uses four items (namely having own control, resources, knowledge, and e-procurement has differences with other systems). Problem-focused Adaptation uses five items (namely communicate with other team members, IT specialist, helpdesk and admin, initiate to know something, and searching several sources). Emotion-focused adaptation uses twelve items (namely ask moral support from partners, discuss with spouse of family members, discuss with superior, convince that e-procurement is an opportunity to improve knowledge and experience, etc) and IS infusion uses four items of metrics (namely use of e-procurement for support task and performance, use all e-procurement capability, e-procurement is the best way, and e-procurement has been integrated with tasks). All items are adapted from Beaudry and Pinsonneault (2005) and measured by using five Likert-scales (strongly disagree to strongly agree.)

The population is e-procurement users of the municipal government of Bengkulu Province, that are the committee procurement and vendors. All of vendors were selected as sample. Primary data is collected by self-administered questionnaires from January to May 2018. All data were examined using the Partial Least Square (PLS). The test is started by the evaluation of validity and reliability test. Furthermore, the test continues to structural analysis to empirically test the proposed hypotheses.

4. Results

The analysis is initiated by providing descriptive analysis output. 68 respondents in this study are individuals who are active users of e-procurement or SPSE (Sistem Pengadaan Secara Elektronik) application of Bengkulu City Government who served as a procurement committee of goods and services or members of the working group Procurement Unit (Unit Layanan Pengadaan/ULP) and winner vendor in e-tendering of Bengkulu City Government Year Budget 2017.

Table 2. Respondents' demography

Category	Number of Respondents	Percentage (%)
Gender		
Male	54	79
Female	14	21
Total	68	100
Last education		
High Education	9	13
Diploma	3	4
Undergraduate	50	74
Postgraduate	6	9
Total	68	100
Age		
25-30 Years	12	18
31-35 Years	20	29
36-40 Years	13	19
> 40 Years	23	34
Total	68	100
Position		
The working group of the procurement services unit (ULP)	17	25
Vendor of goods/services	51	75
Total	68	100
Period of using SPSE		
< 1 Year	3	4
1-3 Years	21	31
4-6 Years	31	46
> 6 Years	13	19
Total	68	100

Category	Number of Respondents	Percentage (%)
Conduct SPSE socialization		
Yes	57	84
Never	11	16
Total	68	100
Frequency of SPSE socialization		
1x	49	67
> 1x	19	33
Total	68	100

Source: Own elaboration (2018)

According to Table 2, it is obviously seen that the respondents are mostly dominated by male. This indicates that the heavy workload and pressure of various parties in the scope of work of the procurement process of government goods and services require the respondents to have a high intensity that causes women often feel reluctant for a career in the procurement of government goods and services. Also, this condition is triggered by the characteristics of works that are more technical and requires more technical capabilities owned by men.

Respondent's education indicates that respondents who are responsible for the operation of e-procurement application have adequate and sufficient formal education. Education is closely related to the abilities and skills as possessed by the respondents as a stock to be able to run the job well. While the age of respondents shows that the majority of respondents are in the productive age category, in which the respondents tendency is more familiar and responsive to a new technology adoption.

The use of SPSE shows that most of the respondents have long worked as procurement committee or vendor so that there is enough experience level in SPSE context. This is also supported by the majority of respondents (84%) that have followed the socialization, although the majority only one time.

4.1 Measurement model results

Measurement model in PLS technique is used to test the validity of the construct (convergent and discriminant) and the reliability of the research instrument (Abdillah and Jogiyanto, 2015; Tenenhaus et al., 2005).

Table 3. Output of measurement model

Variables	AVE	Composite Reliability	R-Square
Emotion-Focused Adaptation	0.614	0.889	0.461
Problem-Focused Adaptation	0.700	0.845	0.362
IS Infusion	0.702	0.823	0.217
Threat Appraisal	0.525	0.921	
Opportunity Appraisal	0.582	0.864	
Secondary Appraisal	0.618	0.874	

Source: SmartPLS Output, own elaboration (2018)

In order to meet convergent validity of the construct, first, we dropped some indicators that do not meet the minimum cut-off of outer loadings (item loading < 0.5). These items are PK1, PS4, AM6, AM7, AE1, AE3, AE4, AE5, AE7, AE3, AE4, AE5, AE5, AE7, AE3, and IS3. After the deletion, then, we further proceeded to the AVE value output. As seen in Table 3, AVE values of each construct are greater than the threshold level (0.5) (Henseler et al, 2009), meaning that AVE value > 0.5 convey the sufficient variance for the indicators to converge into a single construct. The information of AVE values has presumably shown sufficient convergent validity for the proposed construct (see Table 3).

Table 4. Cross value indicators with constructions in model

Indicator	Emotion-Focused Adaptation	Problem-Focused Adaptation	IS Infusion	Threat Appraisal	Opportunity Appraisal	Secondary Appraisal
AE10	0.914	0.049	-0.124	0.586	-0,227	-0.352
AE12	0.690	0.006	-0.096	0.537	-0.155	-0,019
AE2	0.572	0.248	0.029	0.407	-0,095	-0.153
AE6	0.538	0.124	0.084	0.221	0.055	-0.164
AE8	0.864	0.037	0.078	0.427	-0,053	-0.154
AE9	0.903	0.211	0.124	0.511	0.004	-0,251
AM1	-0.038	0.614	0.185	0.059	0.404	-0.024
AM2	0.049	0.799	0.353	0.061	0.486	0.237
AM3	0.202	0.760	0.371	0.063	0.309	0.096
AM4	0.185	0.774	0.295	0.042	0.301	0.029
AM5	0.125	0.657	0.431	-0,055	0.438	0.060
IS1	0.016	0,500	0.910	-0,170	0.570	0.208
IS2	-0,026	0.319	0.851	-0.179	0.583	0.309
IS4	0.063	0.141	0.549	0.024	0.345	0.339
PA1	0.591	0.095	-0,040	0.843	-0.260	0.082
PA2	0.340	0.075	-0.069	0.705	-0.291	0.150
PA3	0.465	0.028	-0.177	0.870	-0.230	-0.002
PA4	0.555	0.162	-0.105	0.897	-0.192	-0.109
PA5	0.537	-0.184	-0.338	0.856	-0.370	-0.123
PK2	-0.039	0.449	0.558	-0.261	0.804	0.263
PK3	-0.152	0.460	0.493	-0.207	0.804	0.317
PK4	0.003	0.424	0.587	-0,300	0.805	0.338
PK5	-0.177	0.381	0.387	-0,227	0.718	0.131
PS1	-0.148	0.105	0.482	-0,057	0.425	0.699
PS2	-0.298	0.116	0.137	-0.006	0.207	0.938
PS3	-0.097	0.068	0.283	0.048	0.299	0.858

Source: SmartPLS Output, own elaboration (2018)

As the next step of convergent validity, discriminant validity is conducted. This procedure has been done through the structural analysis using SmartPLS. It can be observed that in Table 4, the values of cross-loading indicators are higher in constructs than cross-loading in other constructs. Indicating that variables and the indicators used in the study are fit to be used in the structural model. Also, the higher cross loading value of indicators compared with the cross-loading value in other construct has shown an evidence that the model has sufficient discriminant validity. To further convince the discriminant validity output, in an un-tabulated Table we report that the square root of AVE value is higher than the inter-correlation among the proposed construct. Additionally to construct validity test, validation of measurement model, reliability testing is done by composite reliability method. The results in Table 3 show that all constructs are reliable with the criterion of reliability test value> 0.7.

4.2 Structural model results

The hypothesis testing in this study using inner model with 95% confidence level and error analysis (α) = 5%. The test was performed using bootstrapping method in SmartPLS 3.2.7 software to obtain path coefficients (β). Based on the coefficient value of each path in Table 5, four out of eight hypotheses are supported.

Table 5. Structural model results

Path		Original Sample	T-Statistics	P Value	Conclusion
PK	AM	0,661	6,209	0,000	Accepted
PK	AE	0,198	1,043	0,298	Rejected
PA	AM	0,251	1,656	0,098	Rejected
PA	AE	0,667	2,605	0,009	Accepted
PS	AM	-0,099	0,657	0,511	Rejected
PS	AE	-0,312	2,302	0,022	Accepted
AM	IS	0,471	4,611	0,000	Accepted
AE	IS	-0,057	0,346	0,729	Rejected

Source: SmartPLS Output, Data Processing (2017)

5. Discussions

The findings of this study uncover that the opportunity appraisal positively affects problem-focused adaptation. This finding indicates that the ability of the SPSE system to provide positive consequences, such as supporting user tasks. Internet-based SPSE system causes faster process and delivery of information in the form of *aanwijzing*[4] media and online clarification can be accelerating response to questions and clarification of auctions. SPSE placement also reduces user and vendor fees for goods or services because the auction requirement of hard copy is only requested to the winner at the end of the auction process.

According to CMUA, users are firstly involved in a primary appraisal when users assess whether an IT event is deemed as an opportunity or a threat. IS becomes an opportunity appraisal arising from belief that the IS will bring positive consequences (Beaudry and Pinsonneault, 2005). If the users view the IS positively, then

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4) Government process tender which specifications are provided after procurement offer.

the users incline to conduct an adaptive behavioral attempt to deal with the situation, particularly by anticipating the need to learn new skills, overcoming difficulties, and adaptation to working procedures.

Adaptive users behavior to face situation due to the implementation of this SPSE system is a problem-focused adaptation effort. The problem-focused adaptation behavior aims to manage disturbing events by altering the external aspects of situations such as environmental stress, constraints, resources, or procedures (Lazarus and Folkman, 1984). Efforts made by procurement committee and vendor transform external aspects of situation due to SPSE implementation to realize user's expected benefits of IS, for example, attempts to change work adapted habits to the procedures that must be done in following e-procurement. Thus, this problem-focused adaptation behavior can lead actions to improve the efficiency and effectiveness in using IS, which tend to positively affect the user's performance.

The results also show that there is no positive effect of opportunity appraisal on emotion-focused adaptation. This result indicates that users who evaluate a positive SPSE is less likely require drastic adaptive responses, such as less engagement either restoring emotional stability or altering the environment. Emotion-focused adaptation behavior is carried out through positive reappraisal by means of users having to accept the SPSE system as an opportunity to gain a better profit when compared to the manual system. User adaptation efforts are directed at restoring to emotional stability and reducing the tensions caused by IT events, tending to ask for social support from spouses or family members. This situation indicates that users have limited control of SPSE as a mandatory system, with less choice and necessity to understand the procedures in operating SPSE electronically. Otherwise, users are less likely to agree with the consequences of implementing the SPSE system and reduce their involvement in work.

This result does not support Coping Theory (Lazarus and Folkman, 1984; Fadel, 2012). The combination of problems and effort to cope with user's emotions depends on the appraisal of the situation due to the implementation of the SPSE. Logically, positively assessed events are more likely to require problem-focused adaptation rather than emotion-focused adaptations because there is no threat to emotional stability. These results indicate that SPSE's rating system does not affect emotion-focused adaptations, which means that if the system is qualified, then users will continuously use the system (Seddon and Kiew, 1996). Referring to that opinion, it is presumably important to maintain and improve the quality of SPSE so that users are not reluctant to interact with SPSE. Thus, it is expected that improvements made to the quality of the SPSE will be able to improve emotionally focused adaptation users of SPSE System.

This research also found that threat opportunity has no effect on problem-focus adaptation. It indicates that the average users are productive, experienced, and have participated in SPSE socialization. This means that the capabilities of the SPSE users will be able to overcome the perceived negative consequences associated with IT events. However, a problem-focused adaptation can address issues related to IT activities directly, such as developing new standards of behavior, increasing interest in using IT, and seeking training for self-improvement.

According to Fadel and Brown (2010), threat perceptions are strongly influenced by the extent to which users perceive IS to be difficult to use. This means that LPSE can reduce threat perception by ensuring support to help users to cope with IS problems. In addition, it should periodically monitor system and coordinate with developers in Central LKPP to anticipate the existence of anomalies and various threats. It is thus expected that efforts to overcome difficulties in the use of the SPSE system will affect problem-focused adaptation efforts.

This study also found that threat appraisal has a positive effect on emotion-focused adaptation. User's perceived SPSE has several advantages in the process of procurement such as ease of use, saving the cost of procurement administration and cost of use of consumables (e.g. stationery), and speed up the procurement process. However, users also feel the application of the SPSE system as a threat when certain parties want to

take advantage of the SPSE system for a particular interest. Therefore, LPSE should foster employees's responsibilities for managing the SPSE through clear procedures of recruitment, transfer and dismissal, training, and paying attention to unsatisfied employees with the organization which may lead to negative actions.

This study also found that secondary appraisal had no positive effect on the problem-focused adaptation. It indicates that users generally had sufficient IT capabilities but insufficient ability to perform tasks related to electronic auctions, starting from registration, procurement documents, and uploading bidding documents. This finding also indicates users have job autonomy in but less control on technology features and functions of e-procurement as mandatory system.

Furthermore, this study found a negative effect of secondary appraisal on emotion-focused adaptation. Procurement committees and vendor are not able to deny the existence of a dilemma in the procurement process that will affect their emotions. Thus, bidding in the auction must be ensured in accordance with requirements as outlined in the auction document as a specification or technical requirement. In order to achieve these objectives, it must be ensured that the vendor will be able to complete the work according to the contract, such as vendors should have appropriate experience, financial and personnel capabilities adequate, so that work can be done according to the contract. Both technical requirements and qualification requirements must be equally fulfilled.

Furthermore, this study found that problem-focused adaptation has a positive effect on IS infusion. It indicates that users' maturity level (e.g., experience) is considered as capability in managing disturbing events due to SPSE implementation by changing the external aspects, such as environmental stresses, obstacles, resources, or procedures. This finding supports Coping Theory which shows the form of user adaptation as a problem-solving in response to disturbing events occurring in the environment (Lazarus and Folkman, 1984). The CMUA model predicts users who have problem-focused adaptations will more easily achieve effective and efficient results on deep system utilization.

Finally, this study found that emotion-focused adaptation has no effect on IS infusion. It indicates that even though users perceive dissatisfied regarding to technically disadvantage of e-procurement as mandatory system, users are quite capable to adapt the IT events consequences by attempting to reduce emotional tensions. User initiates efforts by soliciting moral support from colleagues, family members and superiors, further motivating oneself with positive thinking towards e-procurement. Thus, it is important to improve user's perceived benefits of e-procurement by increasing user's emotion-focused adaptation.

6. Conclusions

This study found that opportunity appraisal, threat appraisal, and secondary appraisal have an important role in improving problem-focused adaptation and emotion-focused adaptation. However, only opportunity appraisal has an important role in improving problem-focused adaptation. Furthermore, both problems-focused and emotion-focused adaptation play an important role in increasing IS infusion. Problem-focused adaptation is the most dominant variable in influencing IS infusion. These findings are meaningful when problem-focused adaptation and emotion-focused adaptation improved, it will increase e-procurement infusion. Theoretically, this study confirms the role of the CMUA model and Coping Theory in explaining the IS infusion process in the context of local government organizations.

Practically, these findings underscore the need for stakeholders to continuously develop user capabilities (problem-focus adaptation) for handling technical disturbances and optimize organizational control through separation of duties and responsibilities. Also, regarding to security issues, local governments should involve

users in IS development process due to improve users's ownership and provide sufficient job autonomy. Moreover, methodologically, further researches need to expand generalization in the context of other Government agencies, such as ministries and institutions. Also, nonprobabilistic sampling needs to deepen the research context by exploring the research subjects better.

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