

Evidence Management Strategy Related to Security of Electricity Generating Authority of Thailand

Arnada Wanittak¹, Nich Wongsongja², Narong Kulnides³

^{1,2,3} Susan Sunandha Rajabhat University

¹530883@gat.co.th, ²nich.wo@ssru.ac.th, ³narong.ku@ssru.ac.th

ABSTRACT

The knowledge of forensic science leadsto the new form of evidence management strategy of safety and security work. The research has proposed to study the relationship of evidence, innovation, information technology, communication, and monitoring security system that affected evidence management related to the security of the Electricity Generation Authority of Thailand and the development of strategy form related to the security of Electricity Generating Authority of Thailand. The process to do quantitative research and qualitative research. The sample of quantitative research is a staff of the Electricity Generating Authority of Thailand who works in the security sector for 340 persons by using the questionnaire. The sample of qualitative research is the expertise of security work for 11 persons by in-depth interview method and analyzed by using descriptive statistic and structural equation model. The result shows that 1) the relationship of evidence, innovation, information technology, and security testing system effect to strategy in evidence management agree in more level. 2) The variable that has influenced including monitoring security system that shows in-out to an area must be defined new strategy form that has the technology and new biometric innovation of personal identity information is a technology for identifying that combined biotechnology and medical technology with computer technology together. This research result has new knowledge of forensic science that benefits to evidence management strategy related to the security of Electricity Generating Authority of Thailand

Keywords

Forensic Science; Security; Biometrics

Introduction

The forensic science evidence consider as the most important roles to safety and security work of Electricity Generating Authority of Thailand (EGAT) to encourage more effective safety and security work by applying forensic science and applying technology development to support work is one of the mechanism of Electricity Generating Authority of Thailand. Which this will support national development according to government policy and according to National Strategic plan of 20 years. That the plan has foreseen the important of applying digital technology to elevate the safety and security work of government organization to be more up to date, promptly and accuracy of evidence and information. In case there is criminality case that effected to assets, places, documents and the visitors who visit government organization. This policy will able to bring this important device to facilitate all concerned as well as enhance the abilities of safety and security work to be more stable and sustainable (Barrett D, 2013).

From the vision of Electricity Generating Authority of Thailand (GAT) in 2019 that has set all department fields to have same vision for clear practice and go to the same common goal. "GAT is Innovation Power Solution for a Better Life" which safety and security department has apply to set as the work strategy.

The researcher has studied and analyzed more about the chance of criminality (Best-Rowden L, Han H, Otto C, Klare B, Jain AK., 2014) threats and terrorism that possible to occur in many ways. So this is very necessary that safety and security department of GAT need to adjust their usual work to be more proactive integration work by applying forensic science method to find the facts such as evidence, innovation, information technology, communication and

monitoring security system to support effectiveness of safety and security work (Neumann C, Evett IE, Skerrett J., 2012). The applying of forensic science role and applying technology development to support in working is one of the device of Electricity Generating Authority of Thailand which is supporting national development according to government policy and according to National Strategic of Plan 20 years that foreseen the important of applying digital technology to elevate safety and security work of government organization to be more up to date, promptly, evidence accuracy and information. In case of criminality that effect to assets, places, documents and the visitors who visit government organization will able to apply this mechanism to facilitate all concerned as well as enhancing the ability of safety and security work to be more stable and sustainable.

Research Objectives

1. To study the opinions level of evidence, innovation, information and communication technology and monitoring security system that affects to the strategy in evidence management that concern with security of Electricity Generating Authority of Thailand.

2. To study the relationship factors of evidence, innovation, information and communication technology and monitoring security system that affects to strategy in evidence management of Electricity Generating Authority of Thailand.

Research method

This research use technique of combining two research method including quantitative research and qualitative research that has details of each process as follows.

Process 1 the determination of population and sample group - quantitative research select population for 18,882 persons and set the sample group around 20 times of variables in each model. There are total 17 variables so that need sample group 20 times of variables that is staff of Electricity Generating Authority of Thailand who working concerned in safety and security with specific selective for 350 persons. The qualitative research has select sample group from keys information's which are the management level and division staff who working and responsible to security of Electricity Generating Authority of Thailand with specific selective for 11 persons.

Process 2 the determination of variable used in the research - 1) Independent Variable such as Evidence: EVID, Innovation: INNO, Information and Communication Technology: ICTE and Monitoring Security System: SYST and 2) Dependent Variables such as Evidence Management Strategy: STRA.

Process 3 the determination of tools use in researching

3.1 The tools use in qualitative research is questionnaire. The researcher use the main topic in the research to create lists of the questions which can be divide into 2 items such as 1 general information questionnaire which is the questionnaire that the researcher has created to have character as check list such as sec, ages, education, position and experiences, opinion questionnaire of the respondents is the questionnaire that the researcher has created as check list and opinions score at level 1-5 scores with several questions issues from the model relationship structure between dependent variables and independent variables which can be divided into 5 main issues 1) Evidence Management Strategy: STRA, Monitoring Security System: SYST, Information and Communication Technology: ICTE, Innovation: INNO and Evidence: EVID.

3.2 the tools use in quality research is interview form which including 7 main parts such as 1) personal factors 2) evidence information 3) innovation information 4) technology and communication technology information 5) monitoring security service information 6) evidence management strategy information 7) opinions and suggestions.

Process 4 statistic use in information analysis

4.1 The quantitative information analysis to apply those gaining information and change to code number in order to analyze the information by using descriptive statistic. The researcher use finished statistic program to clarify the attributes of the studied populations by analyze to show the data characteristic of sample group and distribution characteristic of variables by using descriptive statistic including frequency, percentage, mean, standard deviation coefficient of variation of variable that notices as the continuous variable and analyze the percentage for canonical variable that are the basis information of sample group. There is the presentation with table and descriptions of Bis correlation analysis to find the relationship between empirical variables and latent variable by using finished statistic program. The analog relationship between every

dependent variables and independent variables and relationship among dependent variables in order to analyze the consistency between research model and empirical data to answer all the defined hypothesis.

4.2 The quantitative data analysis. The researcher has apply the results as mentioned above to process data analysis by using systematic analysis method and apply information from the studied to develop theoretical knowledge which is the open-ended information. The researcher then apply to do content analysis to present descriptively.

Results

Objectives1 - opinions level of the evidence, innovation, information and communication technology, monitoring security system that effect to evidence management strategy that concern with security of Electricity Generating Authority of Thailand.

The analysis results of personal factors of the respondents found that majority of sample group working under security field of Electricity Generating Authority of Thailand. There are male ages between 51-60 years, graduated bachelor degree, position in 6-8 level and working duration or experience between 26-30 years by the researcher has present opinions level of latent variables by using mean and standard deviation as follow.

Table 1 the analysis results opinions level of variables.

Order	Latent Variables	Mean	S.D.	Level
1	Evidence	3.82	0.76	5
2	Innovation	3.91	0.78	3
3	Information and Communication Technology	3.89	0.81	4
4	Monitoring Security System	3.98	0.73	1
5	Evidence Management Strategy	3.97	0.76	2
	Overall	3.91	0.76	

From the table 1 found that in overall the opinions level of monitoring security system show Mean = 3.98, S.D. = 0.73. The evidence management strategy show Mean = 3.97, S.D. = 0.76. Innovation show Mean = 3.91, S.D. = 0.78. Information and communication technology show Mean = 3.89, S.D. = 0.81 also in the high level of opinions. The evidence show Mean = 3.82, S.D. = 0.76 in the high level of opinions as well and for the part of standard deviation found average lower than 1. This is show that the information distribution of every variables are in appropriate opinions level. That is mean the sample group have similar or not too different opinions.

Objectives 2 - relationship factors of the evidence, innovation, information and communication technology and monitoring security system that have an effect on evidence management strategy of Electricity Generating Authority of Thailand.

2.1 The results of relationship analysis between empirical variables.

The result of relationship analysis between every variables that use to analyze found no high relationship among dependent variables also found that relationship rate between empirical variables has statistical significant relationship. By found that most of the variables have statistical significant relationship in level .01. And can be

explain details that evidence management strategy has relationship with innovation, information and communication technology and monitoring security system also found that the relationship in evidence management strategy that consist of empirical variables is awareness, perception, practicing and attitude have the statistical significant relationship also the latent variables evidence which consist of empirical variables that is the personal finger print, documents signatures, evidence collection and evidence keeping that has statistical significant relationship also innovation variables that consist of empirical variables are newness, development and creativity that has statistical significant relationship. Also latent variables of information and communication technology which consist of empirical variables are information and communication technology statistical significant relationship. Moreover, the latent of monitoring security system which consist of the empirical variables are screening people, accessibility to authorize area and monitoring has statistical significant relationship.

2.2 The model comparison results according to hypothesis and alternative model.

Table 2 the model comparison results according to hypothesis and alternative model.

Lists	Statistic	Hypothesis Model	Alternative Model
1. Chi-Square Statistics	+Less than0	566.37	89.97
	+Equal todf	109	74
Relative Chi-Square	Quotient bydf < 2	5.197	1.216
2. GFI	> 90	0.84	0.97
3. AGFI	> 90	0.77	0.94
4. RMR	Nearly to0	0.066	0.036
5. RMSEA	< 05	0.111	0.025
6. CFI	> 0.1	0.92	1.00
7. CN	> 200	60.74	388.37

From the table 2 the model comparison results according to hypothesis and alternative model found that alternative model has the goodness of fit index value of the created model with the covariance metric of population found that the model has concordance with empirical data in the good level and found that size of critical sample is the good enough represent for the data. But the concordance level after adjust the model to have concordance with empirical data will be in the good level. By the part of correlation index of the sample group is in the nearly good level. Therefor regarded as alternative model is the good model according to the standard and able to apply to use better than hypothesis model and appropriate enough to be the composition model that effecting to the evidence examination.

2.3 The analysis results of the total relationship path, direct and indirect relationship.

Table 3 the analysis results of the total relationship path, direct and indirect relationship.

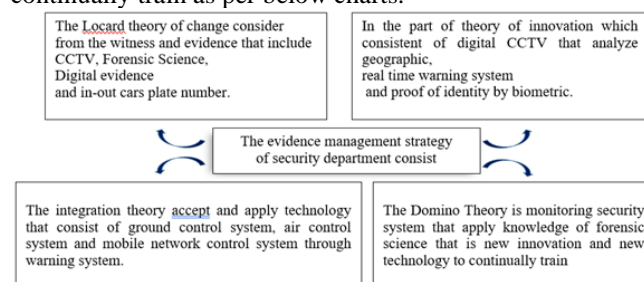
Dependent Variables	Relationship	Independent Variables			
		EVID	INNO	ICTE	SYST
INNO	DE	0.57	-	-	0.35
	IE	-	-	-	0.22
	TE	0.57	-	-	0.57
ICTE	DE	0.34	0.57	-	0.28
	IE	0.33	-	-	0.11
	TE	0.67	0.57	-	0.39
SYST	DE	0.24	0.22	0.35	0.13
	IE	0.36	0.20	-	-
	TE	0.60	0.42	0.35	0.13
STRA	DE	0.26	0.35	0.28	-
	IE	0.47	0.22	0.11	-
	TE	0.73	0.57	0.39	-

Dependent Variables	Relationship	Independent Variables			
		EVID	INNO	ICTE	SYST
	Chi-Square=8997	Df=74 RMSEA=0.025	GFI=0.97 CFI=1.00	AGFI=0.94 CN=388.37	RMR=0.036
Note:		DE=Direct Effects	IE=Indirect Effects	TE=Total Effects	

From the table 3 the analysis results of the total relationship path, direct and indirect relationship can be concluded that variables has influence to evidence management strategy the most including monitoring security system the overall analysis results found that the measurement of concordance index value has consistent with empirical data that has standard in good level.

Objectives 3 - To present the evidence management strategy of security department of Electricity Generating Authority of Thailand.

The evidence management strategy of security department consist of Locard theory of change consider from the witness and evidence that include CCTV, Forensic Science, Digital evidence and in-out cars plate number. In the part of theory of innovation which consist of digital CCTV that analyze geographic, real time warning system and proof of identity by biometric. The integration theory accept and apply technology that consist of ground control system, air control system and mobile network control system through warning system. The final theory is Domino Theory is monitoring security system that apply knowledge of forensic science that is new innovation and new technology to continually train as per below charts.



Picture 2 the evidence management strategy of security department.

Discussion

1. The opinions level of the evidence management strategy in evidence aspect that concern with the security of Electricity Generating Authority of Thailand. Thai found that there is the consistency with the result of quantitative research that found document-signature, witness and evidence protection, personal fingerprints and the keeping of evidence have the opinions level in very agree level. The innovation aspect found that there is the consistency with the result of

quantitative research that found newness, development and creativity have opinions level in the very agree level. The information and communication technology found that there is the consistency with the result of quantitative research that found information and communication technology have the opinions level in very agree level and the monitoring security system aspect found that there is the consistency with the result of quantitative research that found the transparency of in-out to the area, screening and follow up have opinions level in very agree as well. By the innovation has consistent with Clayton Christensen (Theory of Disruptive Innovation).

By the Theory of Disruptive Innovation is the process that lead into changes that create sustainability growth to business organization with reply on using innovation and create the different from the leader no matter about technology (Christensen, C. M. & Raynor, M., 2003) and about information technology to consistent with the principle of Unified Theory of Acceptance and Use of Technology: UTAUT by Venkatesh and the group who has studied about the combination of various theory that concern with the acceptance of main theory (Venkatesh, V., Morris, 2003) such as technology acceptant theory of the user as measure of success of the technology use development, Technology Acceptance Model: TAM as such.

In the result of qualitative research from the in-depth interview turn to found that must reconsider the management strategy and develop to adjust the strategy to consist with the change that take place (Dror IE, Wertheim K, Fraser-Mackenzie P, Walajtys J., 2012). Must have the strategy determination both proactive and reactive. The forensic science is new thing for the staff who working in the safety and security division. The staff must get train both forensic science knowledge and must continuous and consistency to have rehearsal of duty plan about problem solving with consciously in order to practice work efficiency according to safety and security policy, occupational health and working environment of Electricity Generating Authority of Thailand.

The strengthen and integration information connectivity including evidence, innovation, information and communication technology and monitoring security system and the development of evidence management strategy that concern with safety and security to have forensic science knowledge and suitability in all dimensions (Gelb A, Clark J., 2013). Endowed with vision and principle of Forensic science to have determination of measure to supporting appropriate work of safety and security and consistent with current situation and future, also are the enhancement of modern safety and security work and has international standard. Luandee S and Suebpong Siri, (2018) indicate in the supporting way to the studied result above. When there is the evidence variable in case of wound assessment of forensic accompanying the case, will cause the rate of convict in case about offenses related to body and life increase to 7.797 times.

2. The factors of relationship between Evidence, Innovation, Information and Communication Technology and monitoring system that effected to evidence management strategy of Electricity Generating Authority of Thailand. The rate of relationship between empirical variables has

statistical significant relationship. The variables that has most influence to evidence management strategy is monitoring security system. The results of picture analysis in overall found that fit index rate consistent with empirical data and follow the standard that show consistent of model and empirical data that has standard in the good level. The comparison of model follow hypothesis and alternative model found that alternative model has fit index of created form with metric of co-variable of population found that the form has fit index with empirical data in good level.

3. Evidence Management Strategy of safety and security division of Electricity Generating Authority of Thailand found that evidence management strategy of safety and security division that consistent with theory of change of Locard to consider with evidence that are CCTV, Forensic Science, Digital Evidence and In-out car plate number. In the part of Theory Innovation which included Digital CCTV analyze in geographic, Real-time alarm system and Identity proof by Biometric. The integration theory of acceptance and use of technology including of Ground Control System, Air Control System, Mobile Network Control System, and Alarm System. The last theory is The Domino Theory is the monitoring security system that use the knowledge of forensic science, new innovation and modern technology to continue training in the same direction with Joseph L. Peterson et al. (2013) about using of forensic science evidence in solving the criminal case that happened in The United State of America found that forensic science evidence is the success evidence in solving the case by effect to working in every process starting from arrest process, police process, attorney process and court hearings process.

Conclusion

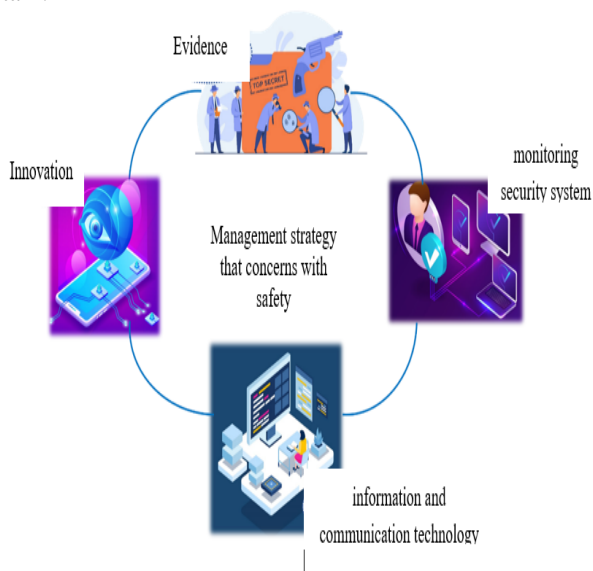
From the research result found that 1) The relationship between the Evidence, Innovation, Information and Communication Technology and Monitoring Security System that effected to evidence management theory have agree in more level. 2) The influential variable including Monitoring Security System. By in-out to area must have set of new strategy that have technology and new innovation. Biometric of personal identity document is the technology for verify the identity of person that combine bio-technology and medical to computer technology together. The analysis results in overall found that fit index consistent with empirical data according to the standard that show the consistency of model and empirical data that has standard in the very good level.

This result has benefits to Electricity Generating Authority of Thailand. EGAT is the government organization that induce the work procedure to achieve the vision of "Thailand has Stability Wealthy Sustainability" lead to be the development country according to the "Philosophy of Sufficiency Economy" as per the plan of National Strategy 20 year that use in the planning of Country Development Model (2018-2037). This is the first strategy of Thailand according to the constitution of Thailand which include 6 national strategies 1) National Strategy of Security 2) National Strategy of Competitiveness 3) National Strategy of Enhancement Human Capital

Development and Strengthening 4) National Strategy of Social Cohesion and Just Society 5) National Strategy of Sustainable Development and Growth and 6) National Strategy of Good Governance.

New Knowledge

The research found that the evidence management strategy that concern with safety and security should have connection of integration work of document and evidence, innovation, information and communication technology and monitoring security system through technology and innovation. From the applied statistic and analysis in forensic science dimension of safety and security department to increase work efficiency able to help decrease and prevent possibilities of threats and also is the model organization of government division to continue stable and sustain.



Picture 1 Knowledge from the research

Suggestion

From the results, the researcher has suggestion as follow.

1. The suggestions from research results.

1.1 The benefits to staff who working in safety and security department are the benefits about administration management and applying of forensic science in safety and security to increase work efficiency including the adaptation to familiar with working in digital and technology age and new innovation (Meuwly D, Veldhuis R.,2012) which happened all the time.

1.2 The benefits to government organization that emphasize in safety and security management strategy are the benefits in guideline development or important safety and security project in the form of system management in the same standard with EGAT. Also including human resources development which should get the support to have training according to the standard of professional.

1.3 The benefits to social and environment to be the organization model of sustainability are beneficial to society (Mnookin JL, et al.,2011) that will create relationship

to surround society to have cooperation in model organization development of green energy and environmental due to the reducing paper use in organization by using technology and innovation replace in work operation.

The suggestion for next research

2.1 Should have study about evidence management with safety and security work of Electricity Generating Authority of Thailand from the new technology on the world of digital.

2.2 Should have the system development about applying the forensic science to use more in working operation.

2.3 Should have arrange the training project development to provide forensic science knowledge that concern with safety and security work within the organization.

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