Emerald Insight

International Journal of Organizational Analysis

Fostering innovation in public organizations in Thailand

Patthera Suwannathat Pasu Decharin Anupap Somboonsavatdee

Article information:

To cite this document:
Patthera Suwannathat Pasu Decharin Anupap Somboonsavatdee , (2015),"Fostering innovation in public organizations in Thailand", International Journal of Organizational Analysis, Vol. 23 Iss 4 pp. 528 - 544
Permanent link to this document:
http://dx.doi.org/10.1108/IJOA-03-2012-0563

Downloaded on: 10 November 2016, At: 02:41 (PT)
References: this document contains references to 58 other documents.
To copy this document: permissions@emeraldinsight.com
The fulltext of this document has been downloaded 353 times since 2015*

Users who downloaded this article also downloaded:

(2002),"Leadership and innovation in the public sector", Leadership & Organization Development Journal, Vol. 23 Iss 8 pp. 467-476 http://dx.doi.org/10.1108/01437730210449357

(2015),"Constructing a typology of culture in organizational behavior", International Journal of Organizational Analysis, Vol. 23 Iss 4 pp. 506-527 http://dx.doi.org/10.1108/IJOA-03-2013-0650

Access to this document was granted through an Emerald subscription provided by emerald-srm:563821 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

The current issue and full text archive of this journal is available on Emerald Insight at:
www.emeraldinsight.com/1934-8835.htm

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Fostering innovation in public organizations in Thailand

Patthera Suwannathat
Technopreneurship and Innovation Management Program, Chulalongkorn University, Bangkok, Thailand
Pasu Decharin
Department of Commerce, Chulalongkorn Business School, Chulalongkorn University, Bangkok, Thailand, and
Anupap Somboonsavatdee
Department of Statistics, Chulalongkorn Business School, Chulalongkorn University, Bangkok, Thailand

Abstract

Purpose – The purpose of this paper is to bring together the mutual perspectives of the "employee" and "client" dimensions of the factors that contribute to innovation in public organizations.

Design/methodology/approach – The potential factors in nurturing innovation in public organizations are identified through the literature review. Structural equation modeling (SEM) was used to develop the models. Data collection and quantitative analysis were used to explore and understand each determinant. The models were evaluated at the managerial level by both "employee" and "client".

Findings – Findings reveal that management commitment is the essential factor that drives strategic orientation to boost innovation. This can be explained using three finalized models.

Research limitations/implications – This paper explores only the domestic factors of the classifications. The results may not be generalizable to other countries in the region.

Practical implications – Thoroughly understanding the factors influencing successful innovation in public organizations contributes to greater satisfaction of the needs and requirements of citizens.

Originality/value – This paper offers novel models of the organizational culture of public organizations seeking innovative policy solutions.

Keywords Public sector, Innovation, Government, Public sector organizations, Thailand, Organization

Paper type Research paper

Introduction

Public organizations are often considered synonymous with inefficiency and a lack of motivation to be innovative. Theorizing about the management of public organizations presents a unique set of restrictions and demands. This study presents a two-year effort to study the critical factors in nurturing innovation in public organizations from the

International Journal of Organizational Analysis
Vol. 23 No. 4, 2015
pp. 528-544
© Emerald Group Publishing Limited
1934-8835
DOI 10.1108/IJOA-03-2012-0563

This research has been supported by a grant from the 90th anniversary of Chulalongkorn university fund (Ratchadaphiseksomphot Endowment Fund). We would like to thank Vunnaporn Devahastin Suthapreda and Narongsak Poomsrisaard for their helpful suggestions and comments in conducting this research and data analysis.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

viewpoint of employees, leaders and citizens. The paper develops the causes and consequences of innovation in public organizations as perceived by employees and clients. Structural equation modeling (SEM) is used to examine two theoretical models and four alternative models. Management commitment and strategic orientation are the most important factors of innovation in public organizations. The factor of assets and capabilities is also vital for innovation development in public organizations. The paper concludes with a discussion of theoretical and practical implications.

Literature review

This section provides a brief background concerning literature related to drivers, inhibitors and outcomes of innovation.

Innovation (INNOVATION)

Damanpour (1987) defines innovation as adoption of a change that is new to an organization and to the relevant environment. Lawson and Samson (2001) argue that innovation capability refers to a firm's ability to continuously transform knowledge and ideas into new products, processes, systems and outcomes for the benefit of the firm. Innovation may occur in every aspect of an organization's operations and can therefore be classified by organizational function. Bessant and Tidd (2007) classify innovation in four dimensions: production innovation, process innovation, position innovation and paradigm innovation. Some authors have attempted to make a distinction between innovations that are technical (new technologies, products and services) and administrative (new procedures, policies and organizational forms) (Van De Ven, 1986). In this study, three innovation types (product, service and process innovation) were adapted and revised from previous studies to measure innovation in public organizations.

The proposed model development

The research model was developed by drawing on literature linking innovation systems. Figure 1 shows the proposed framework which hypothesizes that innovation can be influenced by various factors from integrative studies. Previous studies in the area of innovation suggest a variety of factors that can have an important impact in

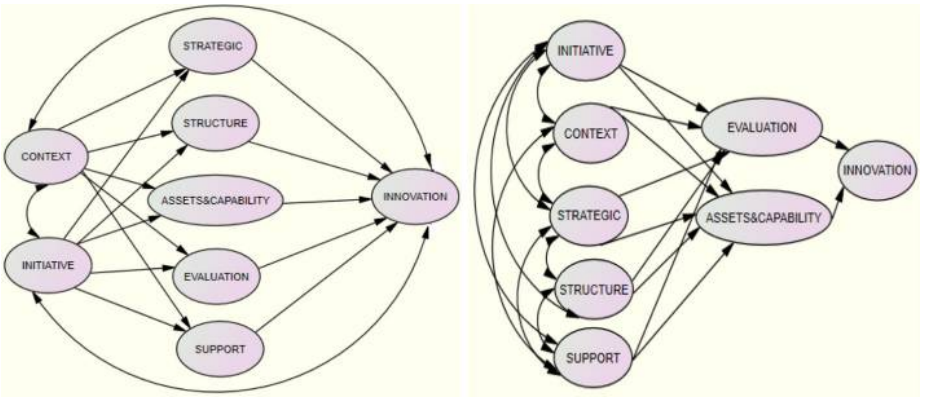


Figure 1.
Proposed framework models: A (left), and B (right)

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

fostering innovation. However, the arguments were based mainly on evidence from private organizations. It is crucial for innovation creation in organization that all following constructs have been developed by exploring in the context of public organization. The models are the result of synthesizing knowledge found in a diverse range of literature related to innovation. The models consist of eight constructs. Each of the eight constructs comprises a set of closely related key concepts. The relation of the eight constructs are observed from a combination of literature review and in-depth interviews from the nine principal advisors in Thailand (Patthera, 2010):

(1) *Primary or initiation factors (INITIATIVE):* Positive cultural characteristics provide an organization with the necessary ingredients to innovate (Ahmed, 1998). Schneider *et al.* (1996) argue that climate and culture are linked: employees' values and beliefs (culture) influence their interpretations of organizational policies, practices and procedures (climate). According to Ahmed (1998), culture has many characteristics that enhance or inhibit innovation. Johannessen *et al.* (1999) explain that innovative organizations are proactive, take risks, create commitment and initiate change. Martins and Terblanche (2003) have developed a model to describe organization culture based on the ideal organization and the importance of leadership in creating an ideal organizational culture.

(2) *External orientation factors (CONTEXT):* Intra-organization factors alone are not sufficient to address innovation and its evolution in the modern world. Information concerning the external environment, "context", can be obtained through this study. Context emanates from an external environment that emphasizes economic competition. The relationship between external orientation and internal systems is rather elusive. Because there is no consensus concerning this relationship, the context and initiative factors have been placed together at the same input level in this research. The external orientation of an organization also influences its ability to innovate successfully. Citizens are also demanding more personalized services in the modern era. Contact with outside sources, namely, citizens or client can be a fertile source of critical innovation in the public organizations effectively.

(3) *Strategic orientation (STRATEGIC):* An organization that has incorporated innovation as a part of its mission is more likely to be innovative. It is necessary to plan and choose projects that focus on the customer and lead to novel product strategies, missions and goals (Cooper, 1999; Griffin and Hauser, 1996). Moreover, top management must prescribe a set of strategic goals while allowing personal freedom within the context of those goals. The essence of a leader's commitment is to develop visions for an organization to effectively recognize strategic opportunities as they arise and successfully seek new capabilities or policies necessary to capture opportunities.

(4) *Organizational structure and boundaries of the firm (STRUCTURE):* Both public and private organizations are affected by their respective incentive structures. However, the private sector may focus on one-dimensional structure to increase revenues and returns on investments, whereas public organizations may focus on more complex and multi-faceted structures to serve a diversity of citizens' requirements. To understand innovation in public organizations, this

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

should be seen in close connection to the incentive structure of the public organization. According to literature concerning organizational structure, to build up innovation usually means to specify organizational design characteristics that lead to innovation. According to Arad *et al.* (1997), a flat structure consisting of small autonomous structures and focusing on team work best promotes innovation. In contrast, structures that are more formal and centralized inhibit innovation.

(5) *Essential skills for public officers (SKILL):* Competence (agility, attitude and intelligence) may differ between types of organizations and include a range of skills, such as creativity and opportunity recognition plus specific technical skills (Roos *et al.*, 1997). From the perspective of competence, a consistently strong relationship between a learning organization culture and innovation suggests that innovative firms are learning oriented (Roffe, 1999). Employees are also more likely to be creative when they are empowered to take initiative for solving problems (Leonard-Barton, 1995). For an organization to innovate, both creativity-related skills and domain-related knowledge are necessary. Boyett (1996) describes the need for strong leadership interaction between public organizations and their entrepreneurial leader for taking risks.

(6) *Essential resources in public organization conductive to innovation (RESOURCE):* Dess and Beard (1983) suggest that capacity and resource munificence play a large role in determining whether or not an organization will choose to implement a new program or policy. If resources are plentiful, the rules to adapt new projects, programs or policies become more relaxed, meaning that potential innovative programs are more likely to be accepted. Essential resources may be drawn from both internal and external environments (Rainey, 2003). This relationship suggests a causal linkage between context and the other four internal factors (initiative, structure, evaluation and support factors) to asset and capability factor of proposed framework Model B (Figure 1).

(7) *Factors associated with support mechanisms (SUPPORT):* Intrinsic rewards such as increased autonomy and improved opportunities for personal and professional growth may support the innovation process. It is important to reward individuals as well as teams, particularly on specific projects relevant to innovation (Tushman *et al.*, 1997). Information and communication technologies are particularly attractive for policy-makers, as they hold the promise of reducing, processing and analyzing information plus implementing policy decisions much more rapidly (Rothwell, 1992).

(8) *Performance evaluation (EVALUATION):* Performance of an organization is the result of managerial decision-making. Decision-making is also significantly influenced by evaluation mechanisms. An evaluation mechanism is used to assess whether the conditions necessary to implement innovation are appropriate and the degree to which practice is best used. The use of innovation evaluation provides an overall assessment of the practices adopted and enables decision-makers to identify whether or not the required managerial processes and practices are in place (Chiesa *et al.*, 1996). The Office of the Public Development Commission (OPDC) routinely awards public organizations in Thailand that excel in the area of quality of services and innovation based on the

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

principle of total quality management (TQM). In this paper, the criteria for innovation evaluation are based on a combination of criteria from Chiesa *et al.* (1996) and the OPDC (briefly described in Appendix 1).

Research methodology

This paper examines potential factors that are conducive to innovation in public organizations in Thailand from the perspectives of employees and citizens. The proposed models are shown in Figure 1. This study reviews literature in the fields of innovation, innovative organization, innovation management, public value and new public management. The proposed framework has been tested and validated using the structural equation modeling (SEM) technique. The results from each model have been reviewed to explore the mutual development of the public offices and clients of public organizations. In-depth interviews have been used to validate the models from two principle advisors; Vunnaporn Devahastin Suthapreda, Director of Innovation Development Department from OPDC, and Narongsak Poomsrisaard, Assistant Vice President at CP All Public Co., Ltd.

Statistical methodology

A SEM technique has been used to capture the causal influences (regression effects) of the variables and the causal influences of variables on one another. The research steps and methods include instrument development, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and testing of the model. Measurement items in the questionnaire have been developed to identify the factors of engendering innovation in public organizations.

The survey was piloted with 30 staff members in public organizations and 30 customers in Thailand. Some of the questionnaire items have been revised to avoid technical jargon. The main survey was conducted from March to November, 2011. A total of 1,600 questionnaires were distributed among 112 public organizations. Among those organizations, 38 had won recognition for service innovation from OPDC in Thailand in 2010 and 2011. The questionnaires were directly delivered to clients to maximize participants' commitment and to provide them with confidence that the data they provided would be used properly.

EFA was used to determine the number of latent variables that underlie the complete set of items. This technique is useful in early stages of empirical analysis where the basic purpose is exploration. However, this technique does not assess unidimensionality (Segar, 1997). Several researchers have recommended the use of CFA with a multiple-indicator measurement model to assess unidimensionality (Anderson, 1987; Segar, 1997). Convergent validity was assessed by examining the significance of individual items. The overall fit of a hypothesized model can be tested by considering maximum likelihood. This research has used a wide range of measurements, including chi-square over degree of freedom (CMIN/df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), the root mean square error of approximation (RMSEA) and standardized residual. Recommendation of a suitable sample size can be considered from the HOELTER level (should be more than 200). To assess the fit of the model to the data of the study, CMIN/DF, GFI, AGFI, CFI and RMSEA have been computed. R. Kline (1998) recommends goodness-of-fit (GOF) indices as shown in Table I.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Sampling techniques

The sample for this study was drawn from the Thai Government Electronic Directory Services. The questionnaires were sent to 112 organizations such as department of education, general public service and economics based on the Classification of the Functions of Government (COFOG) defined by the United Nations Statistics Division. The initial mailing elicited 296 usable responses. Follow-up phone calls were made and mails were sent one month after the initial mail. An additional 20 usable responses were returned. The low response rate was solved by using a direct survey instead of questionnaires. The total usable number of responses was 1,143. The overall response rate for this study was 61.18 per cent. It is important to deal with the potential problem of non-response bias. To address this issue, a comparison of early (those responding to the first mail) and late (those responding to the second mail and direct distribution) respondents (mixed mode survey) is recommended by Dillman (1991).

Results and discussion

Input of raw data was stored in AMOS version 18.0. SEM was performed using the maximum likelihood method. Respondents rated the 50 questions (Appendix 1) using a five-point scale where 1 = strongly disagree and 5 = strongly agree.

Respondents

The summary of the respondents' background is shown in Tables II-III. The survey involved 1,600 people at government offices in Thailand (1,100 employees and 500 direct customers of the respective public organization). Of those asked, 1,116 people completed the questionnaire (69.75 per cent). Eventually, 1,049 questionnaires were usable for analysis. Of those, 429 were completed by males (37.90 per cent) and 687 by females (61.55 per cent). Their ages ranged from 21 to 60 years.

Factor analysis

EFA was first conducted to identify potentially problematic items and to yield a preliminary indication of unidimensionality, discrimination and convergent validity. The items concerned innovation facilitators and interpretability of the seven factors. The factors include leadership and raising innovation; external orientation; strategic exploration and exploitation; organizational task and structure design; skills of public officers; assets and capabilities; information and communication; plus performance evaluation of each factor. Only one item that was originally considered in the structure factor had to be moved to the strategy factor (Strategy 5 from Appendix 1).

Goodness-of-fit (GOF) indices	Recommended level of GOF
Chi-square/degree of freedom (CMIN/DF)	Acceptable < 3; ideal < 2 (Bagozzi and Yi, 1988)
Goodness-of-fit index (GFI)	0 (no fit)–1 (perfect fit)
Adjusted goodness-of-fit index (AGFI)	0 (no fit)–1 (perfect fit)
Root mean sq. error of approximation (RMSEA)	< 0.05 (very good)–0.1 (threshold)
Comparative fit index (CFI)	0 (no fit)–1 (perfect fit) (above 0.9 would be preferable)
PCLOSE	> 0.05
HOELTER	> 200

Table I.
Recommended level of GOF measures

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Position categories	Employee No.	Response rate	Missing values[a]	Customer No.	Response rate[b]
Government official: operation worker positions group	128	38.78	7	42	–
Government official: knowledge worker positions group	176	53.33	19	31	–
Government official: director level	27	49.01	5	7	–
Government official: executive level	28	50.90	4	128	–
Enterprise governor/outsourcing	314	95.15	21	233	–
Others	0	0	0	441	–
Total	673	61.18	66	443	88.60

Table II. Summary of respondents' backgrounds

Notes: [a] The study had 66 missing values for the employees; [b] all questionnaires were returned from the direct survey of customers

Geographic background	Description	Employee Frequency	(%)	Customer Frequency	(%)
Gender	Male	236	35.1	193	43.3
	Female	437	64.9	250	56.4
Age	≤ 25 year	57	8.5	109	24.6
	26-35 year	287	42.6	198	44.7
	36-45 year	157	23.3	99	22.3
	> 45 year	172	25.6	37	8.4
Education	Below undergraduate	48	7.1	67	15.1
	Undergraduate	373	55.4	314	70.9
	Master	230	34.2	61	13.8
	Doctoral	22	3.3	1	0.2
	Total	673	100.0	443	100.0

Table III. Summary of respondents' geographic backgrounds

The grouping of items from EFA closely resembles the groupings classified in the literature review.

The CFA on the individual scales resulted in all scales being satisfactory; no items needed to be deleted. The CFA on the overall measurement model yielded standardized loading results greater than 0.50, all of which are significant (p-value < 0.05) as shown in Table IV.

Model measurement

Two measurement models were constructed (Figure 1) based on related literature. AMOS version 18.0 was used as a statistical package. Models A and B show the linkage of latent variables as represented by ovals. The observed variables are listed in Appendix 1. A seven-factor measurement model of context (eight items), initiative (six items), strategic (five items), structure (five items), evaluation (seven items), assets and capabilities (eleven items) and support (eight items) has been developed.

The overall results are shown in Table V and the paths of all revised models are graphed in Figure 2. The results show that the revised structural models (A, B, C and D) have acceptable levels as determined by the chi-square over the degree of freedom index

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Employee	Probability level	CMIN/DF	AGFI	CFI	RMSEA	PCLOSE	HOETLER
Recommended GOF	> 0.05	1 to 3	1 (perfect fit)	1 (perfect fit)	< 0.05	> 0.05	> 200
CONTEXT	0.065	1.622	0.979	0.994	0.03	0.925	701
INITIATIVE	0.096	1.793	0.981	0.998	0.034	0.752	787
STRATEGIC	0.089	2.171	0.98	0.998	0.042	0.549	807
STRUCTURE	0.785	0.433	0.996	1	0	0.983	3,679
ASSETS&CAPABILITIES	0.069	1.458	0.974	0.997	0.026	0.99	700
SUPPORT	0.215	1.258	0.984	0.999	0.02	0.988	787
EVALUATION	0.312	1.171	0.986	1	0.16	0.952	1,113
CUSTOMER							
CONTEXT	0.244	1.225	0.975	0.996	0.023	0.928	602
INITIATIVE	0.667	0.679	0.989	1	0	0.954	1,367
STRATEGIC	0.069	2.18	0.971	0.989	0.052	0.406	481
STRUCTURE	0.126	1.906	0.975	0.998	0.045	0.47	605
ASSETS &CAPABILITIES	0.07	1.405	0.963	0.995	0.03	0.948	460
SUPPORT	0.15	1.363	0.973	0.995	0.029	0.89	534
EVALUATION	0.093	1.623	0.971	0.995	0.038	0.702	499

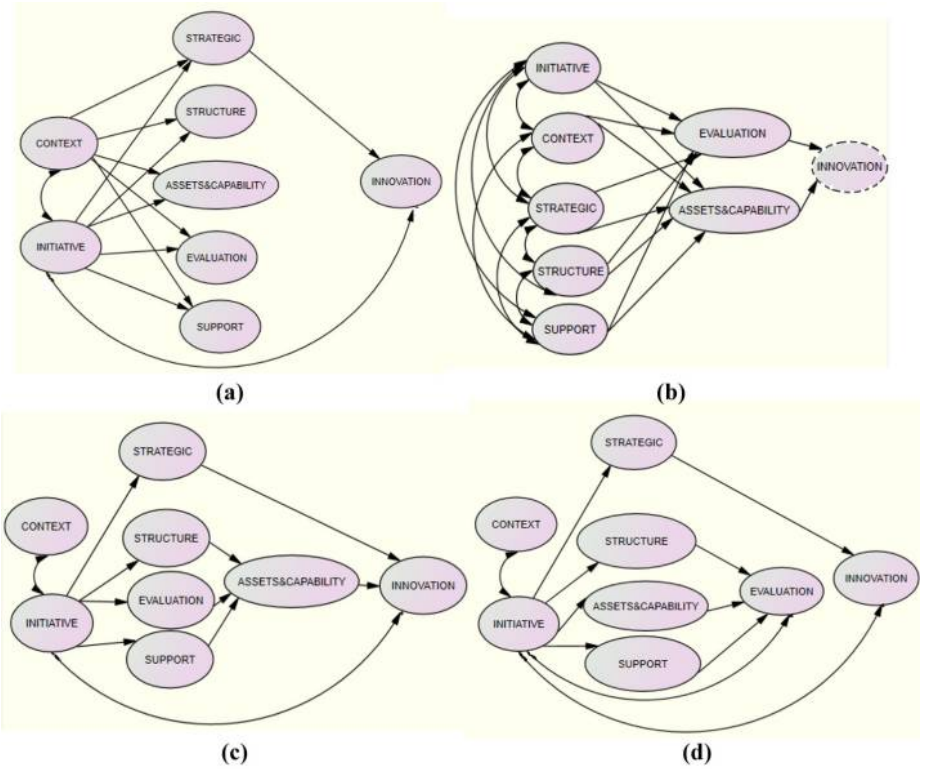
Table IV.
CFA result–analysis GOF for both employee and customer groups

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Table V.
Measurement results

Goodness-of-fit (GOF) indices	Proposed models A	Proposed models B	Revised models Revised A	Revised models Revised B	Revised models Revised C	Revised models Revised D
CMIN/df	2.854	2.540	2.022	1.911	2.037	1.968
AGFI	0.774	0.801	0.844	0.851	0.843	0.847
CFI	0.868	0.890	0.929	0.937	0.928	0.932
PCLOSE	0.000	0.361	1.000	1.000	1.000	1.000
RMSEA	0.055	0.050	0.041	0.039	0.041	0.040
HOELTER (0.05)	226	254	320	338	317	325
Standardized coefficient estimates[a]						
INNOVATION ← INITIATIVE	0.534	–	0.012	–	–	0.014
INNOVATION ← CONTEXT	0.453	–	–	–	–	–
INNOVATION ← STRATEGIC	0.377	0.061	0.011	0.062	0.040	0.013
INNOVATION ← STRUCTURE	0.786	–	–	–	–	–
INNOVATION ← ASSETS&CAPABILITIES	0.800	0.073	–	0.067	0.044	–
INNOVATION ← SUPPORT	0.235	–	–	–	–	–
INNOVATION ← EVALUATION	0.291	–	–	–	–	–

Note: [a]Shows only the latent paths



Notes: (a) Revised model A; (b) revised model B; (c) revised model C; (d) revised model D

Figure 2.
Revised frameworks

(CMIN/DF = 2.022, 1.911, 2.037 and 1.968 which are all less than 3 for revised models A, B, C and D, respectively). Other indices (AGFI, CFI, PCLOSE, RMSEA and HOELTER) exceeded their common acceptable levels, implying that the structural model portrays an acceptable fit to the data.

In addition to the GOF indices, the standardized coefficient estimates must also be considered for all paths. Model B demonstrates the best fit indices compared with the recommended level in Table I among all tested and proposed models. However, standardized coefficient estimates need to be checked for all paths. In the testing stage, the validity of the hypothesized paths was ascertained by checking the statistical significance of all the structural parameter values. Three models (A, C and D) achieved recommended levels, including standardized coefficient estimates. The results from those three models are very similar. However, revised Model C was chosen as the most appropriate model because all items are linked together and tend toward innovation. Results from all three revised models are discussed in the next section.

Discussion and implications for the analysis

Results from revised Models A, C and D lead to a conclusion that public organizations adapt to their surroundings. Further, as social, political and economic environments

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

shift (context factor), management responds by altering its strategies and processes. The results from all revised models show that the initiative and context factors are intimately related and serve as the primary factors. Although risk-taking decisions are not always desirable in the public sector, public organizations need to encourage risk-taking behavior, as their policy environment is never entirely predictable and stable.

The results shown in Table VI indicate 16 potential paths through innovation. Models A and D were found to have five paths that successfully progressed from the starter stage to successful innovation. Model C yielded 13 potential paths toward innovation, the highest number among all the models.

Of the ten possible strategies leading toward innovation, Path Number 4 was found to be most effective. This finding implies that organizations following Path 4 have the greatest potential for innovation. An example of an OPDC award-winning organization can clarify the relevance of each factor that occurs in Path 4. The Office of Transport and Traffic Policy and Planning creates real-time traffic alerts and traffic reports to view online interactive traffic maps for local road conditions. Their planning process begins with the context factor, namely, the need for Bangkokians to improve their quality of life by reducing traffic congestion at peak hours. Subsequently, the support stage involves support from the managerial commitment from the director of the transport office.

For Models A and D, the initiative factor (Path Number 1) shows a direct effect on innovation without any factors acting as the mediator. The reason is that senior executives influence innovation by creating a favorable culture and belief toward innovation. In public organizations, leaders' commitment manifests by promoting projects, seminars and discussions that foster the transfer of innovative programs. At higher levels of innovation, capability resource assets, such as an innovative workforce and collaborative relationships clearly present the potential to transform ideas into practical innovation outcomes.

Results for revised Model C, plus discussions with the principle advisors, indicate that interface between the four levels (Starter, Mediator 1, Mediator 2 and Mediator 3) within public organizations deserves explanation: the managerial level, including politicians, constitutes the top level that takes responsibility for citizens and their resources. The diagram of revised Model C shows that top management in organizations focus on innovation (initiative factor) and are also committed to well-organized structures, the evaluation system and the supporting system that induces innovation (the structure, the evaluation and the support factors) represent middle ground between asset and capability factor and initiative factor. This causal effect relationship implies that the top management from the initiative factor is committed to the structure, evaluation and support factors. The level of leadership in an organization can be used to predict the level of knowledge sharing in that organization. From the relationship of various factors mentioned above, knowledge management appears to be the most important requirement for the innovation process in public organizations. The origin of innovation from a top-down policy or bottom-up policy depends on the strategy of the leader to drive the whole process. The challenge is to integrate the work between government officers at the managerial level and the employees who directly provide public services. In Thailand, top-down policies are suggested when budgets are very limited. When action and responsibility are properly devolved, government officers are empowered to take action.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Path no.	Revised model	Starter	The achieved paths to innovation Mediator1	Mediator2	Mediator3
1	A, D	INITIATIVE	–	–	–
2	A, D	INITIATIVE	STRATEGIC	–	–
3	A, D	CONTEXT	INITIATIVE	–	–
4	A, C, D	CONTEXT	INITIATIVE	STRATEGIC	–
5	C	CONTEXT	SUPPORT	ASSETS&CAPABILITIES	–
6	C	CONTEXT	INITIATIVE	EVALUATION	ASSETS&CAPABILITIES
7	C	CONTEXT	INITIATIVE	SUPPORT	ASSETS&CAPABILITIES
8	C	CONTEXT	INITIATIVE	STRATEGIC	ASSETS&CAPABILITIES
9	C	INITIATIVE	EVALUATION	ASSETS&CAPABILITIES	–
10	C	INITIATIVE	SUPPORT	ASSETS&CAPABILITIES	–
11	C	INITIATIVE	STRATEGIC	ASSETS&CAPABILITIES	–
12	C	EVALUATION	ASSETS&CAPABILITIES	–	–
13	C	SUPPORT	ASSETS&CAPABILITIES	–	–
14	C	STRATEGIC	ASSETS&CAPABILITIES	–	–
15	C	ASSETS&CAPABILITIES	–	–	–
16	A, C, D	STRATEGIC	–	–	–

Table VI.
Summary of significant paths of revised models A, C, and D

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Revised Model D shows a link between three factors (support, structure and assets and capabilities), and evaluation factor was used as the performance measurement practice from a broad range of public organizations. Empirical evidence shows that the structure, support, assets and capabilities and initiative factors directly affect the evaluation factor, but do not affect innovation. Potential barriers may exist that prevent the diffusion of administrative innovation programs in organizations. This is particularly true in the design of internal control and auditing systems where barriers tend to be exacerbated. Barriers can arise due to political interests blocking the adoption process. Other barriers include a lack of compatibility between the social context of the organization and the change process, the relative absence of a new paradigm that articulates change and external threats from government regulation and competitors. The success or failure of an innovation implementation in public organization could not be measured like in private organization. The measurement mechanism of the public organization is composed of social (e.g. effectiveness within society) and public value (e.g. cost efficiency and money) (Graham *et al.*, 2007).

Academic contribution

Previous studies regularly report the government service design model applied in public organizations. For instance, Goldstein *et al.* (2002) describes the service model composed of service strategy, inputs, service delivery system, outputs and performance measures. Public officers or government agencies provide different levels of contact and interaction with citizens. This research clearly shows that the government service model can include innovation in two significant aspects that can be applied in Goldstein *et al.* (2002) as following:

- It emphasizes that the public officer and managerial levels provide different levels of contact and interaction with citizens. However, a complex relationship exists between authority and the discretion that needs to be balanced.
- It emphasizes the intimate relationship between the context and the initiative factors from our finding should be bundled in the policy-making process in the stage of the service strategy.

In terms of the innovation typology, most studies of innovation have been explored based on studies of technical innovations (Meeus and Edquist, 2006; Miles, 2005). Administrative innovations pertain to organizational structure, administrative processes and human resources (Gopalakrishnan and Damanpour, 1994; Walker, 2006). The innovations included in this study are the combination of the administrative and technical.

Conclusions and further research

All factors in Model C are linked together in important ways. This research has examined direct and moderated paths toward innovation in public organizations. The results reveal that the initiative factor is the starter factor in all models, as the role of top management is to create an environment with values, norms and positive motivation. Further, innovation strategies play a crucial role in building innovation as a novel product, policy or service to satisfy citizens. The findings show that the existence of only one factor cannot nurture innovation by itself. The mediator or the intermediate factors can act as co-evolution for generation of factors. To highlight the importance of distinguishing between each factor is the satisfactory requirement management

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

between managerial level of the organization who have "authority" and "end users". The findings point to the need to develop more robust theories of innovation to classify each typology of the function in organizations and a better understanding of the complex process of practical processes in public organizations.

Future studies could provide a richer understanding of the adoption of innovation over time. Although data from multiple sources were used in this study, future research could embrace a wider scope. The data represent Thai public organizations; caution should be applied regarding the external validity of the study to public organizations in other countries in the ASEAN region and later stages of the regional reform movement.

References

Ahmed, P.K. (1998), "Culture and climate for innovation", *European Journal of Innovation Management*, Vol. 1 No. 1, pp. 30-43.

Anderson, J.C. (1987), "An approach for confirmatory measurement and structural equation modeling of organizational properties", *Management Science*, Vol. 33 No. 4, pp. 525-541.

Arad, S., Hanson, M.A. and Schnieder, R.J. (1997), "A framework for the study of relationships between organizational characteristics and organizational innovation", *The Journal of Creative Behavior*, Vol. 31 No. 1, pp. 42-58.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation model", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Bessant, J. and Tidd, J. (2007), *Innovation and Entrepreneurship*, Wiley, NJ.

Boyett, I. (1996), "The public sector entrepreneur – a definition", *International Journal of Public Sector Management*, Vol. 9 No. 2, pp. 36-51.

Chiesa, V., Coughlan, P. and Voss, C.A. (1996), "Development of a technical innovation audit", *Journal of Product Innovation Management*, Vol. 13 No. 2, pp. 105-136.

Cooper, R.G. (1999), "From experience: the invisible success factors in product innovation", *Journal of Product Innovation Management*, Vol. 16 No. 2, pp. 115-133.

Damanpour, F. (1987), "The adoption of technological, administrative, and ancillary innovations: impact of organizational factors", *Journal of Management*, Vol. 13 No. 4, pp. 675-688.

Dess, G.G. and Beard, D.W. (1983), "Dimensions of organizational task environment", *Administrative Science Quarterly*, Vol. 29 No. 1, pp. 52-73.

Dillman, D.A. (1991), "The design and administration of mail surveys", *Annual Review of Sociology*, Vol. 17 No. 1, pp. 225-249.

Goldstein, S.M., Johnston, R., Duffy, J. and Rao, J. (2002), "The service concept: the missing link in service design research?", *Journal of Operations Management*, Vol. 20 No. 2, pp. 121-134.

Gopalakrishnan, S. and Damanpour, F. (1994), "Patterns of generation and adoption of innovations in organizations: contingency models of innovation attributes", *Journal of Engineering and Technology Management*, Vol. 11 No. 1, pp. 95-116.

Graham, O., Tony, E., Ah, L.K. and Rana, T. (2007), "Local government and social or innovation value", *Transforming Government: People, Process and Policy*, Vol. 1 No. 3, pp. 242-254.

Griffin, A. and Hauser, J.R. (1996), "Integrating R&D and marketing: a review and analysis of the literature", *Journal of Product Innovation Management*, Vol. 38 No. 1, pp. 360-373.

Johannessen, J., Olsen, B. and Olaisen, J. (1999), "Aspects of innovation theory based on knowledge management", *International Journal of Information Management*, Vol. 19 No. 2, pp. 121-139.

Kline, R. (1998), *Principles and Practice of Structural Equation Modeling*, Guilford Press, New York, NY.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Lawson, B. and Samson, D. (2001), "Developing innovation capability in organizations: a dynamic capabilities approach", *International Journal of Innovation Management*, Vol. 5 No. 3, pp. 377-400.

Leonard-Barton, D. (1995), *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*, Harvard Business School Press, Boston.

Martins, E.C. and Terblanche, F. (2003), "Building organizational culture that stimulates creativity and innovation", *European Journal of Innovation Management*, Vol. 6 No. 1, pp. 64-74.

Meeus, M.T.H. and Edquist, C. (2006), "Introduction to part I: product and process innovation", in Hage, J. and Meeus, M. (Eds), *Innovation, Science, and Institutional Change*, Oxford University Press, Oxford, pp. 23-37.

Miles, I. (2005), "Innovation in services", in Fagerberg, J., Mowery, D.C. and Nelson, R.R. (Eds), *The Oxford Handbook of Innovations*, Oxford University Press, Oxford, pp. 433-458.

Patthera, R. (2010), "Innovative organization in public sector", *Proceeding of 2010 International Conference on Asia Pacific Business Innovation & Technology Management*, *Pattaya*.

Rainey, H.G. (2003), *Understanding and Managing Public Organizations*, 3rd ed., Jossey-Bass, San Francisco, CA.

Roffe, I. (1999), "Innovation and creativity in organizations: a review of the implications for training and development", *Journal of European Industrial Training*, Vol. 23 Nos 4/5, pp. 224-237.

Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L. (1997), *Intellectual Capital: Navigating the New Business Landscape*, MacMillan Press, Basingstoke.

Rothwell, R. (1992), "Successful industrial innovation: critical factors for the 1990s", *R&D Management*, Vol. 22 No. 3, pp. 221-239.

Schneider, B., Brief, A.P. and Guzzo, R.A. (1996), "Creating a climate and culture for sustainable organizational change", *Organizational Dynamics*, Vol. 24 No. 4, pp. 7-18.

Segar, A. (1997), "Assessing the unidimensionality of measurement: a paradigm and illustration within the context of information systems research", *Omega*, Vol. 25 No. 1, pp. 107-121.

Tushman, M.L., Anderson, P.C. and O'Reilly, C. (1997), *Winning through Innovation: A Practical Guide to Lead Organizational Change and Renewal*, Harvard Business School Press, Boston, MA.

Van De Ven, A.H. (1986), "Central problems in the management of innovation", *Management Science*, Vol. 32 No. 5, pp. 590-607.

Walker, R.M. (2006), "Innovation type and diffusion: an empirical analysis of local government", *Public Administration*, Vol. 84 No. 2, pp. 311-335.

Further reading

Anderson, J.C., Gerbing, D.W. and Hunter, J.E. (1987), "On the assessment of unidimensional measurement: internal and external consistency, and overall consistency criteria", *Journal of Marketing Research*, Vol. 24 No. 4, pp. 432-437.

Arbuckle, J. and Wothke, W. (1999), *Amos 4.0 User's Guide*, Small Waters, Chicago, IL.

Bart, C.K. (1996), "The impact of mission on firm innovativeness", *International Journal of Technology Management*, Vol. 11 Nos 3/4, pp. 479-493.

Burns, T. and Stalker, G.M. (1961), *The Management of Innovation*, Tavistock, London.

Chandler, G.N., Keller, C. and Lyon, D.W. (2000), "Unraveling the determinants and consequences of an innovation-supportive organizational culture", *Entrepreneurship Theory and Practice*, Vol. 25 No. 1, p. 59.

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Chau, P.Y.K. (1997), "Reexamining a model for evaluating information centre success using a structural equation modeling approach", *Decision Sciences*, Vol. 28 No. 2, pp. 309-334.

Cooper, R.G. (1993), *Winning at New Products: Accelerating the Process from Idea to Launch*, Addison–Wesley, Reading, MA.

Cooper, R.G. (2000), "New product performance: what distinguishes the star products", *Australian Journal of Management*, Vol. 25 No. 1, pp. 17-45.

Damanpour, F. (1991), "Organizational innovation: a meta-analysis of effects of determinants and moderators", *Academy of Management Journal*, Vol. 34 No. 3, pp. 555-590.

Drucker, P.F. (1988), "The coming of the new organization", *Harvard Business Review*, Vol. 66 No. 1, pp. 45-53.

Eisenhardt, K.M. and Tabrizi, B.N. (1995), "Accelerating adaptive processes: product innovation in the global computer industry", *Administrative Science Quarterly*, Vol. 40 No. 1, pp. 84-110.

Hair, J.F., Black, W.C., Babin, B.A.J. and Anderson, R.E. (2010), *Multivariate Data Analysis*, Pearson Prentice Hall, London.

Henri, J.F. (2006), "Management control systems and strategy: a resource based perspective", *Accounting, Organizations and Society*, Vol. 31 No. 6, pp. 529-558.

Hult, G.T.M., Hurley, R.F. and Knight, G.A. (2004), "Innovativeness: its antecedents and impact on business performance", *Industrial Marketing Management*, Vol. 33 No. 1, pp. 429-438.

Hurley, R.F. and Hult, G.T.M. (1998), "Innovation, market orientation, and organizational learning: an integration and empirical examination", *Journal of Marketing*, Vol. 62 No. 3, pp. 42-54.

Inkpen, A.C. (1998), "Learning, knowledge acquisition and strategic alliances", *European Management Journal*, Vol. 6 No. 2, pp. 223-245.

Johannessen, J., Olsen, B. and Lumpkin, G.T. (2001), "Innovation as newness: what is new, how new, and new to whom?", *European Journal of Innovation Management*, Vol. 4 No. 1, pp. 20-31.

Love, P.E.D. and Gunasekaran, A. (1999), "Learning alliances: a customer-supplier focus for continuous improvement in manufacturing", *Industrial and Commercial Training*, Vol. 31 No. 3, pp. 88-96.

Mitchell, R.K., Busenitz, L., Lant, T., McDougall, P.P., Morse, E.A. and Smith, J.B. (2002), "Toward a theory of entrepreneurial cognition: rethinking the people side of entrepreneurship research", *Entrepreneurship Theory and Practice*, Vol. 26 No. 4, pp. 93-104.

Mone, M.A., McKinley, W. and Barker, V.L. III (1998), "Organizational decline and innovation: a contingency framework", *Academy of Management Review*, Vol. 23 No. 1, pp. 115-132.

Mulgan, G. and Albury, D. (2003), *Innovation in the Public Sector*, Ver 1.9 ed., Strategy Unit, London.

Roberts, E.B. and Fusfeld, A.R. (1981), "Staffing the innovative technology based organization", *Sloan Management Review*, Vol. 32 No. 4, pp. 19-34.

Rogers, E.M. (1983), *Diffusion of Innovation*, The Free Press, New York, NY.

Sabatier, P. (1986), "Top–down and bottom–up approaches to implementation research", *Journal of Public Policy*, Vol. 6 No. 1, pp. 21-48.

Twomey, D.F. and Harris, D.L. (2000), "From strategy to corporate outcomes: aligning human resource management systems with entrepreneurial intent", *International Journal of Commerce and Management*, Vol. 10 Nos 3/4, pp. 43-55.

United Nations (2000), "Statistical papers", available at: http://unstats.un.org/unsd/cr/registry/regdnld.asp?Lg=1 (accessed 13 May 2012).

Downloaded by TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES At 02:41 10 November 2016 (PT)

Appendix

Group	Key value
Initiative 1-6 (six items)	Belief, leadership, trust, positive motivation, norm, value
Context 1-8 (eight items)	Globalization, legal and restriction, global economic, social expectation, environment, people engagement, collaborative and public policy
Strategic 1-5 (five items)	Vision, mission, contingency plan, scenario planning and ambidextrous structure
Structure 1-5 (five items)	Project team are flexible and agile, freedom, corporate team, decentralized, cross-functional team
Resource1-6 (six items)	Knowledge management, resource-based perspective, risk management, diversity of staff, secondment or working rotation and innovation management process
Skill 1-5 (five items)	Interpersonal and communication skill, technical skill, psychological skill, creativity and taking risk
Support 1-8 (eight items)	Support to ignore resistance to change, an open communication, network, innovative champion, reward and recognition, technology/ socio-technical system, work environment and support the implementation of new idea, policy or service
Evaluation1-7 (seven items)	Evaluation mechanism and reward system, benchmarking, performance monitoring, improving implementation, documentation raising awareness and virtue team members are equipped with effective ICT tools for evaluation

Table AI.
A brief description of the survey list

About the authors

Patthera Suwannathat (2011-Present) is a Plan and Policy Analyst in Ministry of Industry, Thailand. Dr Suwannathat received her PhD degree in Technopreneurship and Innovation Management, Chulalongkorn University, Bangkok, Thailand.

Pasu Decharin (2011-Present) is an Associate Professor and is the Dean of Chulalongkorn Business School, Chulalongkorn University, Bangkok, Thailand. Dr Decharin has PhD degree in Management of Technology, School of Management, Asian Institute of Technology Pasu Decharin is the corresponding author and can be contacted at: pasu@cbs.chula.ac.th

Anupap Somboonsavatdee (2008-Present) is a Lecturer in Statistics at Chulalongkorn Business School, Chulalongkorn University, Bangkok, Thailand. Dr Somboonsavatdee received his PhD Degree in Statistics at University of Michigan-Ann Arbor.

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: **permissions@emeraldinsight.com**