Creating Community Commons: A Systems-Approach to

Re-vitalize Declined Rural Towns

Toshiyuki Yasui[1*] Seiko Shirasaka[2] Naohiko Kohtake[2] Akiko Tsutsuki[2]

[1]Keio University Advanced Research Center, Keio University, Yokohama City, Japan

[2]Graduate School of System Design and Management, Keio University, Yokohama City, Japan

[*] E-mail: t.yasui@z2.keio.jp

ABSTRACT

This paper proposes a new methodology to design a public policy for re-vitalizing declined rural towns by using a systems-approach to visualize and quantify the residents' preferences on community-building. The new methodology, named the Interactive Social Design Model (ISDM), roots in the Vee model (Forsberg *et al*.[1]), a standard framework to describe the life-cycle of systems developments, and Ostrom [2]'s commons theory. The ISDM provides a new perspective for the regional policy since enhanced social capitals with stimulated social interactions are mobilized as the real engines for regional economic growth and employments. This paper selected the Akita City, a core city in the north-eastern region of Japan now in decay, as the social research field to validate this new methodology. The collected data there and our analysis proved well that the ISDM is effective to accomplish the policy goal for regional re-vitalization.

KEYWORDS: Commons; Regional Policy; Policy Design; Systems-Approach; Vee Model.

1. INTRODUCTION

Downtown commercial area (DCA) in devastation has been a central policy issue for decades among industrialized countries. For responding to this challenge, academic contributions were made mainly from two directions.

One approach is from the policy analysis originated from the systems analysis and the urban development (e.g., Dunn [3], Hopkins [4]). The policy analysis is characterized as the 'top-down' design approach. The framework for design is preset; policy alternatives for the problem are proposed by not stakeholders of the problem but only by policy analysts.

Another approach is from the social capital theory (e.g., Gratz [5], Putnam [6]). This approach values the inherent forces to sustain the community emerged from the social capital, which are the deliverables of diversified social networks and their interactions. The social capital theory is characterized as the 'bottom-up' design approach. The design for a problem-solving is spontaneous and style-free; policy alternatives for the problem may occasionally come from the community stakeholders, but they are not easily applicable to other communities.

Both approach offer partial solutions for the DCA problems. Neither 'top-down' approach nor 'bottom-up' approach can provide the theoretical platform to solve the DCA problems with the holistic view. We need the two-way and interactive methodology to visualize the stakeholders' preferences for re-vitalizing devastated DCA so that it can formulate the creative class (Florida [7]) of the targeted DCA to create both grass-rooted and commonly applicable policy alternatives with the preset design framework, by local residents themselves.

Unbalanced development among regions and

social poverty particularly in decaying rural DCA remain pivotal policy challenges. These problems may significantly affect the sustainable economic growth and the competitiveness of industries. Thus the US industry executives recently pay great attentions to the regional development issues (Council on Competitiveness [8] [9]).

In Japan, the declined DCA in rural regions have been also serious policy problems for both central and local governments since 1960's (Kimura *et al*. [10]). The above-mentioned debate on two contrastive approaches, namely the policy analysis ('top-down') school vs. the social capital ('bottom-up') school toward the rural DCA problem is just mirrored to domestic debates in japan how to re-vitalize the rural DCA, most of which fell into decay.

Both the top-down and the bottom-up approach to visualize and to quantify stakeholders' requirements are embedded in the ISDM, the new systems-approach proposed in this paper, in order to transcend the partiality of either approach.

2. ISDM: BASIC FEATURES

In this section, we describe the basic features and theoretical roots of the ISDM.

2.1 Sequential and Co-Creative Framework

The ISDM has the same structure and sequence for analysis which the Vee model has. The policy creations phases are sequenced from the first phase for collecting and analyzing voice of stakeholders, to the second phase for architecting and design policy alternatives to solve the problem, to the third phase for quantitative verification, to the fourth phase for actual implementation of the selected policy alternative, and to the fifth phase for validating the implemented alternative (Fig.1).

Tools for analysis, architecting, design, verification and validation used on each stage of the ISDM are selected from previous studies and practices of the active learning education for social designs, named as the Active Learning Project Sequence (ALPS) and other studies, practiced in the Graduate School of Systems Design and Management of Keio University since April 2008 (Ishii et al. [11]). The Table 1 illustrates a tool-box of the ISDM.

The ISDM assigns stakeholders of the problem the co-creating role with the policy analysts throughout the design process. Collective creativity (Sanders and Stappers [12]) of the stakeholders produces policy alternatives. They visualize their own preferences for problem-solving with quantitative methods and co-designs solutions by themselves with preset and sequential tools as the co-creation process (Rawaswamy and Gouillart [13]). Xie *et al*.'s 'prosume' model [14] validated the effectiveness of this co-creation approach.
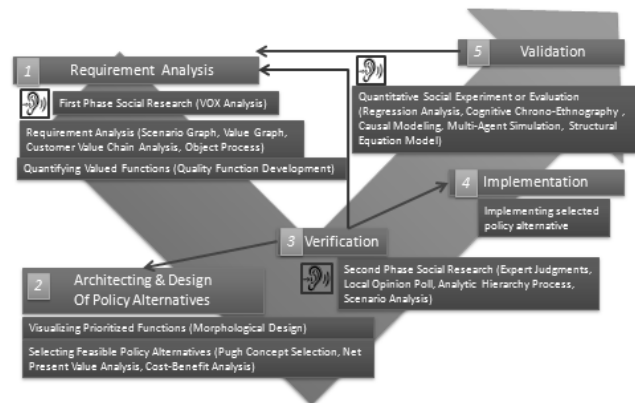

Fig.1. ISDM: Five Sequential Phases

Table 1. Toolbox of ISDM

Phase	Tools (samples)
1. Requirement Analysis	Brain-Storming, KJ Method, Vox Analysis, Scenerio Graph, Value Graph, Customer Chain Value Analysis, Quality Function Deployment, Object Process Methodology
2. Architecting & Design	Morphological Design, Prototyping Rapidly, Pugh Concept Selection, Net Present Value Analysis, Cost-Benefit Analysis
3. Verification	Experts Judgements, Local Opinion Poll, Analytic Hierarchy Process, Scenario Analysis
4. Implementation	(Policy Implementation)
5. Validation	Regression Analysis, Cognitive Chorono-Ethnography, Causal Modeling, Multi-Agent Simulation, Structural Equation Model

2.2 Commons Approach

The commons theory is the underlying theory of the ISDM, the practicable systems-approach for problem-solving. A community inherently holds

the power as the commons, which are collective actions and knowledge management of the sustainable community, to sustain the community-development and growth by using self-learning and self-organizing capabilities of the commons themselves (Poteete *et al*. [15]). The ISDM helps to get the potentials of the commons emerged as collective intelligence, which is often lost from devastated local communities including decaying DCA.

3. CASE STUDY: AKITA CITY DCA

3.1 Reason to Select the Akita City

This paper selected the policy design for re-vitalizing the Akita city DCA as the first case study for the ISDM. The reason why Akita is selected is that it well represents tough situations that the decaying DCA in Japan face today.

The Akita city, the prefectural capitol of the Akita Prefecture with the population of 323 thousand, is one of administrative and commercial centers of the north-east region of Japan. However, the Akita city DCA has suffered constant declines for three decades. Social and economic indicators of Akita show severe conditions of the Akita city DCA residents.

Table 2. Selected Social and Economic Indicators of the Akita Prefecture and the Akita city DCA

Indicators	Ranks/Numbers	Data Source
Victims by Suicides	Top among 47 prefectures (2003)	MHLW [16]
Patients of Mental Diseases	6th among 47 prefectures (2008)	Social Data Website [17]
Degree of Happiness	37th among 47 prefectures (2008)	Yamane *et al*. [18]
DCA Annual Commercial Sales	- 49% (1993 to 2004)	Akita City [19]

3.2 ISDM for the Akita City DCA

The ISDM for the Akita City DCA with local residents was conducted from March 16th to May 22, 2011. Since this time was the first and trial experiment, the authors implemented this case study only from the Phase I (requirement analysis), to the Phase II (architecting & design), and finally to the Phase III (verification).

3.3 Phase I: Requirement Analysis

The authors chose seven tools listed in the ISDM toolbox (Table 1.) for the requirement analysis; the Brain-Storming, the KJ Method, the Local Poll, the Scenario Graph, the Customer Value Chain Analysis, the Value Graph, and the Quality Function Deployment.

First, the focus group meeting (n=21) was held to have the brain-storming, and then to group important requirements for re-vitalizing their DCA by the KJ method as the standard project management procedure (PMI [20]). 21 participants, who represented two of the Akita city DCA shopping mall unions (SMUs), the Akita city-government officials and other two other stakeholder groups respectively, joined the meeting with one of the authors who played the role of a facilitator of the brain-storming and the KJ grouping work (Fig. 2).

Fig. 2. Focus Group Meeting
(At the Akita city DCA, March 16, 2011)

Second, the grouped requirements raised from the focus group meeting were re-organized as the form of the comprehensive questionnaire. Based upon this questionnaire, the authors conducted the local poll (Fig.3) to ask residents in and commuters to the DCA about priorities for re-vitalizing.

Fig. 3. Local Poll Meeting
(At the Akita city DCA, March 27, 2011)

According to the result of the local poll (n=91) with the weighted pointing method, the authors drew the scenario graph (Kim and Ishii [21]) for re-vitalizing the Akita city DCA. It is noted that stakeholders of the Akita city collectively chose the scenario related to the social capital for the community rebuilding. The selected scenario was that the young generation daily comes to the meeting places in the DCA for the exciting events and shopping for interactive social exchanges (Fig.4).

The CVCA analysis for this case study endorsed the result of the local poll. Since the locations of stakeholders may significantly affect the outcome of the analysis, the authors newly extended the CVCA to the Community-Based CVCA (C²VCA) for this paper. The C²VCA adds the analysis for geographical analysis of stakeholders on top of the traditional CVCA. The C²VCA for the Akita city DCA well described the lack of commercial and social magnates inside the Akita city DCA (Fig.5).
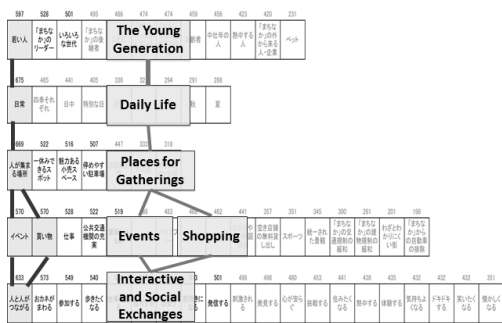

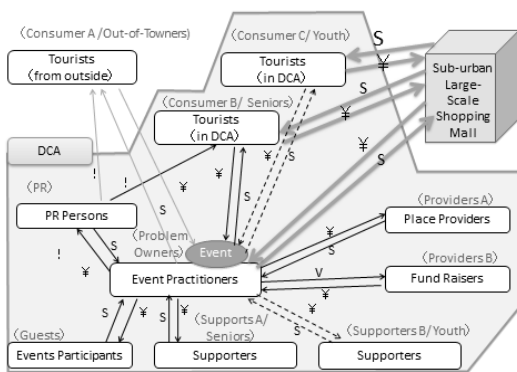**Fig**. 4. Scenario Graph:
Re-vitalizing the Akita city DCA

Fig. 5. C²VCA : Re-vitalizing the Akita city DCA

After conducting the Scenario Graph and the C²VCA analysis, the value graph was written to identify the required values by the DCA stakeholders, social/economic indicators to measure achievements of values, and functions and/or actions to satisfy these indicators. Illustrated ideal

scenario in Fig.4 was then succeeded to the two-fold Quality Function Deployment to select the prioritized functions essentially needed for re-vitalizing solutions (Fig.6). These methods are all along with tools proposed by Ishii and Iino [22].

The two-fold QFD extracted six essential functions/actions (F/As) necessary for re-vitalizing the Akita city DCA.

F/A#1. Raising quality of goods and services (30%)
F/A#2. Planning attractive events (16%)
F/A#3. Increasing the commercial sales (16%)
F/A#4. Gathering the young generation (15%)
F/A#5. Making the public transportation system more convenient (14%)
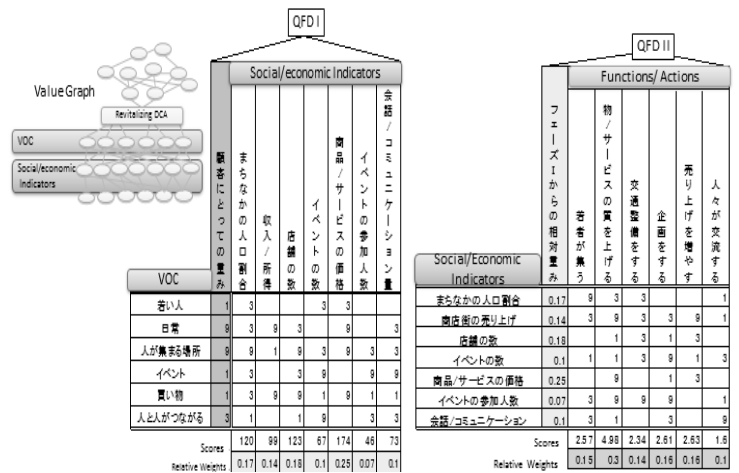F/A#6. Enhancing person-to-person exchanges (10%)

Fig. 6. Two-Fold QFD:
Re-vitalizing the Akita city DCA

3.4 Phase II: Architecting and Design

For architecting and design, the authors picked up three tools from the ISDM toolbox (Table 1.); the Morphological Analysis (Zwicky [23]), the Prototyping Rapidly (PMI [24]), and the Pugh Concept Selection (Pugh [25]).

First, the authors spontaneously developed morphological images (Fig.7) to satisfy six essential F/As extracted in the previous sub-section. Then, various images were re-organized and combined into six policy alternatives (Table 3.).
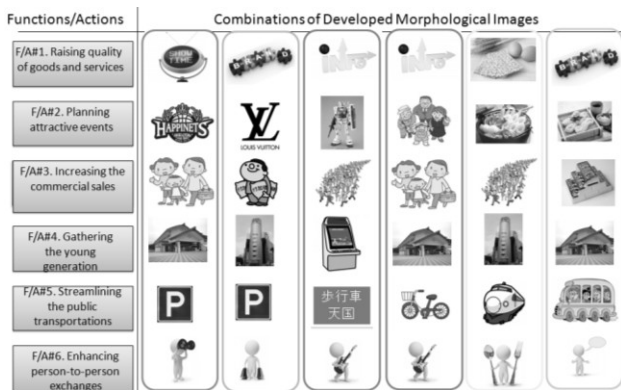
Fig. 7. Morphological Analysis:
Re-vitalizing the Akita city DCA

Table 3. Six Policy Alternatives: the Akita DCA Case

Alternatives	Proposed Contents
1. the DCA Professional Sports	Constructing the indoor stadium and inviting the professional basketball team to the DCA
2. the DCA Brand Shopping Outlet Mall	Converting the DCA into the world premium outlet mall
3. the DCA 'Maniac *Otaku'* Exhibitions	Holding exhibitions to attract niche and core funs of Japan's soft-power (e.g. *Anime*, Computer Games)
4. the DCA Youth Community Spaces for Fun	Offering DCA empty shops for the youth flea markets and social entrepreneurs' events
5. the DCA Gourmet Tour	Organizing the gourmet tour to eat around the local slow-foods of Akita
6. the DCA Community-Branding Open University	Opening the classes to learn the community-branding methodology about Akita in community colleges

After the Morphological Analysis, the authors asked an active-learning expert to shape the mock-ups of all six alternatives by using the educational toys for creation (Fig.8). This work was to facilitate the selection process of the Pugh Concept Selection and the Analytic Hierarchy Process.

Finally, the authors implemented the Pugh Concept Selections to select three alternatives to better satisfy the DCA residents' requirements listed in the Fig.4. Consequently, experts selected by using the Pugh Concept Selection the Alternative 1 (the DCA Professional Sports), the Alternative 2 (the DCA Brand Shopping Outlet Mall), and the Alternative 4 (the DCA Youth Community Spaces for Fun) (Fig.9).

Fig. 8. Example of the Prototyping Rapidly:
Re-vitalizing the Akita city DCA

Requirements	Solution1	Solution2	Solution3	Solution4	Solution5	Solution6
The Young Generation	++	+	D	+++	--	-
Daily Life	+	++	A	+++	S	++
Places for Gathering	+++	++	T	++	++	S
Events	S	-	U	-	S	-
Shopping	-	++	M	--	+	---
Interactive & Social Exchanges	S	-	M	++	-	+++
	5+2S1-	7+2-		10+3-	3+2S3-	5+1S5-
Rank	3	2	4	1	4	4

Fig. 9. Pugh Concept Selection:
Re-vitalizing the Akita city DCA

3.5 Phase III: Verification

The authors selected the Analytic Hierarchy Process (AHP) (Saaty [26]) for the verification from the ISDM toolbox (Table 1.).

The authors visited with six posters of mock-ups made in the previous sub-section and organized the local briefing meeting to let the DCA stakeholders consider them (Fig.10). Participants to the meeting were asked to fill in the AHP survey sheet to quantify their preferences on the proposed three alternatives which experts recommended previously.

The AHP analysis (n=20) showed that the DCA stakeholders preferred the Alternative 4 (the DCA Youth Community Spaces for Fun) the most. They also raised the sustainability as the most important reason throughout for all three alternatives when they made a choice of the DCA re-vitalizing policies (Fig.11).

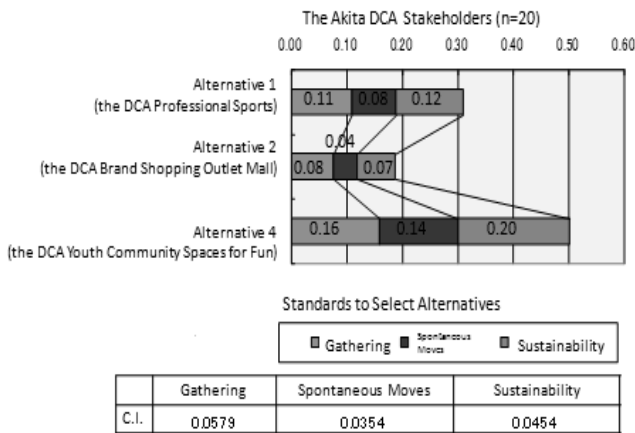**Fig**. 10. Local Briefing Meeting
(At the Akita city DCA, May 22, 2011)

The Akita DCA Stakeholders (n=20)

	Gathering	Spontaneous Moves	Sustainability
C.I.	0.0579	0.0354	0.0454

Fig. 11. Results of AHP:
Re-vitalizing the Akita city DCA

4. DISCUSSION

4.1 Effectiveness of ISDM

As part of the local briefing meeting referred in the subsection 3.5, the authors implemented the poll survey with the important local stakeholders for asking the effectiveness of the ISDM as the methodology for the policy-design to re-vitalize the decaying DCA. The result of the poll was quite favorable; 42% of respondents answered 'very useful'; 58% of respondents answered 'useful'; 0% of respondents answered 'not useful' or 'not at all useful' (n=20).

4.2 Departure from the mainstream policy

The AHP survey conducted in the subsection 3.5 showed that the local stakeholders of the Akita city DCA supported the daily sports entertainments and socio-entrepreneurial exchanges for the policy to boost the decaying DCA. They raised the sustainability as the most important factor when they considered the urban re-vitalization policy in the rural cities.

At least the Akita city DCA stakeholders no longer support the mainstream policy addressed to the decaying DCA since 1995 by the Government of Japan; boosting retail shops and sales services to attract shoppers to the decaying DCA. The judgment made by the Akita stakeholders may imply the major turning-point to depart from the unpopular DCA policy of the Government, which is currently planned and implemented mostly with the top-down approach.

5. CONCLUSIONS

The ISDM, the new methodology to visualize the preferences of local stakeholders by themselves in accordance with the preset sequences of the Vee Model, was proved to work effectively to address to the policy challenges of re-vitalizing a urban community in the rural region by creating the commons for policy design. The stakeholders also significantly supported the ISDM as the useful methodology for the public policy design.

The ISDM has the potentials to be widely applicable to other social problems as the problem-solving and design methodology of the public policy issues.

For further research agenda, the ISDM will have to be practiced in other public policy domains than the regional policy planning. Besides, the ISDM practitioners will be encouraged to increase the local stakeholders' involvements on every phase of the ISDM in actual implementations. In the light of the collective creation theory, enhanced local involvements are expected to raise the performances and the effectiveness of the ISDM.

ACKNOWLEDGEMENTS

the Akita Professional Basketball Company, and the Watcha Project.

REFERENCES

1. Forsberg, K., Mooz.H., Cotterman, H., *Visualizing Project Management*, Third Edition, Chapter 7, pp.108-115, Hoboken, New Jersey, John Wiley and Sons, Inc., 2005.

2. Ostrom, E., *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge, Massachusetts, Cambridge University Press, 1990.

3. Dunn, W., *Public Policy Analysis: Introduction*, 4th Edition, Chapter 4, pp.128-200, Pearson Education, Upper Saddle River, New Jersey, 2008.

4. Hopkins, L., *Urban Development: The Logic of Making Plans,* Washington, DC, Island Press, 2001.

5. Gratz, R., *The Living City*, New York, Simon & Schuster, 1989.

6. Putnam, R., *Bowling Alone: The Collapse and Revival of American Community*, New York, Simon & Schuster, 2000.

7. Florida, R., *Cities and the Creative Class*, Chapters 2, pp.27-45, London, Routledge, 2005.

8. Council on Competitiveness, *Engage; A Practitioner's Guide for Effective Engagement of Business Leaders in Regional Development,* Washington, DC, October 2008, 2008, (http://www.compete.org/publications/detail/593/engage/) (accessed on July 30th, 2011).

9. Council on Competitiveness, *Collaborate; Leading Regional Innovative Clusters*, Washington, DC, June 2010, 2010, (http://www.compete.org/publications/detail/1384/leading-regional-innovation-clusters) (accessed on July 30th, 2011).

10. Kimura, T., Tomita, J., Ohkami, Y., "Using Revitalization Approach Using Strategic System Design", *Tenth Global Conference on Flexible Systems Management* (Yokohama), 2010.

11. Ishii, K., de Wick, O., Haruyama, S., Maeno, T., Kim, S., Fowler, W., "Active Learning Project Sequence: Capstone Experience for Multi-Disciplinary System Design and Management Education", *International Conference on Engineering Design, ICED '09*, 24-27 August 2009, Stanford University, Stanford, California, USA, 10-57～10-68, 2009.

12. Sanders, E. B., Stappers, P.J., "Co-Creation and the New Landscapes of Design", *CoDesign*, Vol.4, No.1, March 2008, pp.5-18, 2008.

13. Rawaswamy, V. and Gouillart, F., *The Power of Co-Creation: Built It With Them to Boost Growth, Productivity, and Profits*, New York, Free Press, 2010.

14. Xie, C., Bagozzi, R.P., Troye, S.V., "Trying to Prosume: Toward a Theory of Consumers as Co-Creators of Value", *Journal of the Academic Marketing Science*, 36:109-122, 2008.

15. Poteete, A., Janssen, M., Ostrom, E., *Working Together: Collective Actions, The Commons, and Multiple Methods in Practice,* Chapter 9, pp.215-245, Princeton, New Jersey, Princeton University Press, 2010.

16. Ministry of Health, Labor and Welfare of Japan Website (in Japanese) (http://www.mhlw.go.jp/toukei/saikin/hw/jinkou/tokusyu/suicide04/#top) (Accessed on May 7th, 2011).

17. Social Data Website (Syakai Jitsujo Data Zuroku) (in Japanese) (http://www2.ttcn.ne.jp/~honkawa/2155.html)) (Accessed on May 7th, 2011).

18. Yamane C., Yamane, S., Tsutsui, Y., "Regional Gap Measured by Felt Happiness", *Osaka University, GCOE Discussion Paper Series Human Behavior and Socioeconomic Dynamics, Global COE Program Human Discussion Paper No.7*, September 2008 (in Japanese) (http://www.iser.osaka-u.ac.jp/coe/dp/pdf/no.7_dp.pdf) (Accessed on January 24, 2011).

19. Akita City-Government, *Akita City DCA Re-Vitalizing Basic Plan (Chushin Shigaichi Kasseika Kihon Keikaku)*, Akita City-Government, (in Japanese) July 2009.

20. Project Management Institute (PMI), *PMBoK Guide*, Japanese 4th Edition, pp.107-108, Tokyo, Project Management Institute, 2008.

21. Kim, Sun K., Ishii, K., "Scenario Graph: Discovering New Business Opportunities and Failure Mode", Technical paper, California, Stanford University, pp.1-8, 2007.

22. Ishii, K. and Iino, K., *Value Creation Design (Kachi Zukuri Sekkei)* (in Japanese), pp.27-50, Tokyo, Yoken-Do, 2008.

23. Zwicky, F., *Discovery, Invention, Research through the Morphological Approach*, New York, McMillan, 1969.

24. Project Management Institute, *PMBoK Guide*, Japanese 4th Edition, pp.303-304, Tokyo, Project Management Institute, 2008.

25. Pugh, S., *Total Design: Integrated Methods for Successful Product Engineering*, Reading, Massachusetts, Addison-Wesley Publication, 1991.

26. Saaty, T., *The Analytic Network Process: Decision Making with Dependence and Feedback,* Second Edition, Pittsburgh, Pennsylvania, RWS Publications, 2001.