Analyzing Strategic Gaps of Digital Divide Projects Based on the Balanced Scorecard

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Abstract. Academic researches, government reports, and international organization surveys have indicated that outcomes of many digital divide projects fail to accomplish their strategic goals, and so that more exertions of strategic management in the government project planning process are expected. In order to ensure the achievement of bridging digital divides, governments need to be aware of their absence and weakness in strategy formulation and implementation in addition to simply launching projects towards strategic visions and objectives. However, the literature shows little help for the governments to detect the shortcomings of their strategies and to identify gaps between strategic objectives and performance measures. The goal of this research is to propose generic strategic gaps models based on the balanced scorecard framework for identifying and analyzing the strategic gap situations. Both horizontal and vertical strategic gaps regarding project efforts for reducing digital divides will be determined and discussed. The proposed approach and analysis models are then applied to the case of Taiwan for demonstrating their feasibility and usefulness.

1 Introduction

Digital divide (DD) is the product under the fast development of information and communication technology (ICT) and the digitalized economy. The existence of DD

may reflect the loss of digital opportunities, the existence of poverty, the lack of fundamental and information literacy, the shortage in medical care system, as well as the encounter of other social problems [1]. Research findings, government reports and surveys conducted by well-known international organizations have indicated that the outcomes of projects for reducing digital divides are inconvincible and more exertions of strategic management in the project planning process are expected [1,2,3,4]. From the theoretical view of decision making, any strategic gaps between the strategic goals and actual project outcomes should be redeemed. Apparently, governments need to be aware of their absence and weakness in strategy formulation and performance measurement activities beyond simply initiating programs to bridging digital divides. Unfortunately, the literature shows little help for governments to detect the shortcomings of their strategies and to identify gaps between strategic objectives and performance measures.

Recognizing the facts that the links between strategic objectives (SO) and actual performance of DD-related strategies are weak, governments need a strategic framework and performance measurement tools for guiding and supporting DD strategy formulation as well as performance measurement tasks. The balance scorecard (BSC) and the strategy map (SM) introduced by Kaplan and Norton have been considered as effective approaches to specify strategic objectives and to measure performances in the public sector [5,6]. However, both Chan (2004) and Griffiths (2003) pointed out in their researches that as a fairly new management tool, more studies on the role of the BSC in the strategic planning and performance measurement of government projects are needed [7,8].

In light of the aforementioned problems and the needs to reveal DD strategic gaps, this paper aims at proposing generic strategic gaps models based on the BSC framework for identifying and analyzing strategic gaps of DD projects. Both horizontal and vertical strategic gaps regarding project efforts for reducing digital divides will be determined and discussed. In the following sections, we first illustrate in section 2 why it is appropriate to incorporate the strategic gap analysis into the development of the BSC. In section 3, steps of locating DD strategic gaps are explained. In section 4, four generic models of DD strategic gaps are proposed. A case study that investigates the DD strategic gaps in Taiwan is described in section 5 to demonstrate how a nation could utilize the generic models to determine its DD strategic gaps. The final section contains concluding remarks and the direction of future studies.

2 The Strategic Gap Analysis, the BSC and the Strategy Map

Initially, a strategic gap is the measure of the inadequate fit between the organization and its external environment. Strategic gaps are generally derived from the gap analysis which depicts the imbalance situations between an organization's goals and capabilities, as well as threats and opportunities [9]. Strategies are determined in the strategic planning stage which focuses on setting objectives, allocating resources, generating alternatives, as well as evaluating effectiveness against constraints and threats in the organizational environment [9,10]. Any inadequate fit in strategies should be located in advance and bridged during the planning and assessment phases.

In 1980s, the traditional strategic gap analysis focused mainly on extrapolating the differences between the desired future position of the organization and its current position [11]. Among various approaches, the SWOT (strength, weakness, opportunity, threat) analysis is a frequently adopted tool in the process of strategy formulation. However, it is found that the SWOT analysis does not serve sufficiently in detecting or diagnosing the logical links and strategic gaps between strategies; and very few firms adopt the SWOT analysis in their later stages of planning and analysis [10]. The balanced scorecard has been indicated as probably the most adopted tool in strategic management discipline in the last decade [12]. The BSC has evolved to become a performance measurement and strategic management tool for translating strategies into actions. The BSC aims at providing the precise and balanced information about four interrelated organizational perspectives including financial, customer, internal process, as well as learning and growth respectively. Strategies, being the core elements of the BSC, are generally viewed as a set or series of activities that will lead the organization to its expected future positions [6]. In every BSC perspective, strategies are illustrated in terms of strategic objectives and a set of performance indicators that are responsible for measuring the accomplishment of these objectives. However, some previous research findings suggest that the BSC alone cannot form a holistic strategic management system, and there is a significant need to connect the BSC concept to other management tools or systems for enhancing the BSC capabilities [10,13].

Previous research works have also suggested the need of a mechanism to show the path from strategies to visions, and to show the network of the interrelationships among strategies [6,12]. The strategy map by all means stands as the best choice since it clarifies the bond of present and future positions of an organization by illustrating the cause-and-effect relationships between strategies [5]. On the other hand, the BSC complements the strategy map by providing the targets, initiatives, and measures to gauge success on the strategic objectives [6]. The BSC and the SM are therefore constructive tools for organizations to conduct strategic planning, control and diagnosis. Nevertheless, in the literature, the quintessence of the strategy map has been constantly overlooked.

After learning the importance of identifying strategic gaps during the process of strategy formulation, it is expected that the strategy map and the BSC may provide guidelines for efficiently and effectively conducting the strategic gap analysis. And in turn, the strategic gap analysis may help the BSC to link objectives with performances more closely and successfully. Therefore, for improving the weaknesses of separate existing technologies, we illustrate in this paper a first attempt to incorporate the strategic gap analysis with the strategy map based on the BSC framework to determine strategic gaps in the strategy formulation process.

3 Steps of Locating Strategic Gaps from the Strategy Map

The gap analysis based on the strategic map will basically adhere to the BSC framework. By organizing the BSC perspectives in a top-down manner, all identified

strategies with strategic themes and strategic objectives within each perspective can be lined up horizontally. Under this arrangement, the strategic gap analyses can be performed both vertically (to examine the gaps between strategies across perspectives) and horizontally (to examine the gaps between strategies within each perspective) [14]. Determining strategic themes is the first major constituent of the BSC approach. There might be hundreds of strategies in relation to bridging digital divide; however, some of them may aim at the same purpose. Therefore, they can be rephrased by a few strategic themes that are simple and easy to understand [15]. Strategic objectives would then be listed to clarify the meaning and the purposes of a strategic theme. Furthermore, strategic objectives should be able to be translated into actual actions and the outcomes of these actions are measurable. The four steps to locate strategic gaps from the BSC-based strategy map are (1) identifying the strategic themes, (2) specifying the strategic objectives, (3) determining the horizontal gaps, and (4) determining the vertical gaps. In the first step, main strategies of a BSC perspective can be clarified through identifying three to five strategic themes [16]. The ideal strategic themes represent strategies that are critical to an organization to move toward its expected position. The current strategic themes, however, are the strategies the organization follows at present. In the second step, strategic objectives are extracted from the themes for specifying the intentions and expected gains to be derived from the strategies. Each strategic theme may imply more than one objective, meaning that it may need to take more than one action to successfully implement the strategies. Similarly, strategic objectives are separated into the ideal and the current ones. The ideal and the current strategic themes/objectives are all listed on one table for the convenience of horizontal comparisons. The third step is to review all the strategic themes (STs) and strategic objectives (SOs) so that the horizontal ST and SO gaps could be located. During the analysis, we could locate two types of horizontal ST gaps. If the integrity of current strategies can not efficiently lead an organization to its mission and vision or to reverse the inferior status, it implies the missing of some important strategic themes, then a TYPE I horizontal ST gap (HSTG-I) is marked. If a strategic theme is considered not clearly defined, a TYPE II horizontal ST gap (HSTG-II) should also be placed on the corresponding cell. For instance, if there is a TYPE I horizontal strategic theme gap in theme 2 of the perspective 2, HSTG-I-P2T2 is placed in the corresponding cell; otherwise, the current theme is accepted. If a strategic theme is proposed but some of its objectives are not clearly specified, and consequently, no actions can possibly be taken to accomplish these strategic objectives, then the corresponding horizontal SO gap (HSOG) is marked. The last step is to determine the vertical gaps that reveal the gaps between interrelated strategies across different perspectives. Before proceeding to the vertical strategic gaps analyses, two strategy maps should be constructed to demonstrate the logical links of the themes/objective across perspectives. Once a strategic theme/strategic objective is found not linked to the interrelated strategic themes/strategic objectives across different BSC perspectives, corresponding vertical strategic gaps are then marked. The vertical strategic gap shows that it would be difficult to streamline and connect strategy outcomes among perspectives. Accordingly, vertical gaps resulted from the broken links between strategic objectives in different perspectives will downgrade the effectiveness of the strategies.

Two types of vertical strategic theme gaps could be located as well. If a strategic theme in a perspective is found not linked to any strategic theme in the upper perspective, a path that could intensify the effects of this strategic theme and smooth the road to the vision is missing, this TYPE I gap is marked VSTG-I. It is then the government's responsibility to redeem the theme and initiate a new theme so that the broken link could be repaired. On the contrary, if a strategic theme is found not supported by any strategic theme from the lower level perspective, it may not get enough resources to continue the implementations of its action plans, a TYPE II gap is marked VSTG-II. It is important to note that once a ST gap is found, it indicates the need to add a new theme to the strategy map. The links to and from this new theme should be carefully established so that the logical path would not be broken again. In locating the vertical SO gaps, if the outcome of a strategic objective has too few or no effects on actions and/or outcomes of interrelated strategic objectives on the upper/lower level perspectives, then corresponding VSOGs are located.

4 The Generic Models for Determining the Strategic Gaps of DD

In this section, this research generates four generic models to pave the way for countries to locate and to determine the types of their own strategic gaps of DD. For measuring and evaluating DD, four dimensions selected include *ICT, Equal Opportunities, Information Society/E-Readiness* as well as *National Competitiveness* that were proved indispensable to measure and evaluate the status of DD [17]. By further incorporated the DD model with the BSC, a DD-BSC framework, containing four perspectives *Beneficiary, Governmental Functions and Process, Nation-Wide Learning and Growth,* and *Financial Perspective* respectively, is presented for guiding the strategy and performance management of DD [18]. In the initial stage, we first gathered critical strategies of reducing DD from countries that have been acknowledged by their efforts and performance on digital economy, ICT diffusion and information society readiness. These countries include Finland, Denmark, Sweden, United States and Japan. Strategies of South Korea were also referred for its strong attempt to convert DD into digital opportunities. In addition, DD related strategies suggested by well known international organizations (such as OECD, APEC, G8 and European Union) and famous research reports (such as Bridge.org, EIU, World Papers) were also collected. The strategies were then generalized and categorized. In the following, steps of determining the strategic gaps of DD are delineated in detail.

4.1 Determining the strategic themes and specifying strategic objectives.

Strategies collected from selected countries and organizations are compiled, and then generalized strategies are presented and grouped with associated strategic themes. Furthermore, strategic themes are mapped to the four BSC perspectives according to their characteristics. In summary, strategic themes that are in favor of people and the results of the actions are considered increasing the use of the ICTs, would be

classified into the Beneficiary perspective. In the Governmental Functions and Processes, strategic themes should focus on improving the performance of government by means of the construction of e-government. In the Nation-Wide Learning and Growth perspective, the purposes as well as the functions of strategic themes are recognized focusing on fostering the formulation of knowledge economy and on improving overall capabilities. Finally, strategic themes categorized in the Financial perspective are grouped due to their main duties for supporting and controlling all activities in other BSC perspectives. As a result, there are six strategic themes in the Beneficiary perspective, namely infrastructure, user satisfaction, new technology, information literacy, policy & regulation, and partnership. In the Governmental Functions and Processes, three themes extracted are E-Strategies, service and E-leadership. In the Nation-Wide Learning and Growth perspective, themes are awareness, capabilities and knowledge innovation. Themes in the Financial perspective include capital, resources and budgeting. The strategic objectives are extracted based on the original intentions of the strategies. They are listed if clearly defined and received a common view across countries.

The ideal themes/objectives listed in table 1 are extracted from selected countries, they suggest a unified approach for reducing DD and show potential means for leveraging performance on national competitiveness. The current themes/objectives however, are specific to some countries. Table 1 actually contains two generic horizontal gap models, the HSTG on the left half and the HSOG on the right.

4.2 Determining horizontal and vertical gaps.

To locate and to determine the types of HSTG/HSOG for a specific nation, the government or users should first collect the current strategies of the nation and placed them into a proper theme of a perspective. Or, the government or users could name a new theme that is unique to the nation. Two HSTG and three HSOG examples are shown in table 1. For a specific nation, assume that the strategic theme "E-Leadership" in perspective 2 is missing, implying that the nation is possibly not able to present any strategy of moving toward "E-Leadership", then TYPE I horizontal gap (HSTG-I-P2T3) is located. Since the missing theme will cause the absence of clearly defined objectives in reengineering governmental process, the horizontal SO gap is also determined and labeled with HSOG-P2T3O1. The second example indicates that the associated strategies could not clearly show the meaning or the functions of "Information Literacy", a TYPE II ST gap (HSTG-II-P1T4) is located. Apparently the existence of HSTG-II-P1T4 will also cause a gap in the objective, and the gap is marked HSOG-P1T4O1.

Before analyzing vertical DD strategic gaps, both ST and SO strategy maps are composed. Two generic BSC-SM models for locating DD-related ST and SO gaps are shown in figure 1 and figure 2. After the vertical trace of the strategic themes in BSC-SM, we located two vertical ST gaps in figure 1 based on two facts: firstly, the links between strategic objectives and performance measures of DD-related government strategies are weak, and secondly, no guidelines as well as benchmark exist for directing the strategic planning process. Apparently two new themes, including "Performance Evaluation" and "Benchmarking" should be added to the

BSC-SM. The OECD suggests that "Performance Evaluation" is to be conducted by the government and its objective is to "Establish measuring and monitoring system". "Performance Evaluation" should be determined as having both the type I and II vertical ST gaps because it is a new theme, and the government should link it to the themes at the upper level perspective so that the path to the vision will not be broken. In addition, the government should also locate enough support from the lower level perspective to signify this new theme, and should provide baselines for conducting the performance evaluation. Besides, these baselines should be amended periodically to ensure the growth and improvement. Hence, "Benchmarking" is placed in the Nation-wide Learning and Growth perspective and determined as having both the TYPE I and II vertical ST gaps. The objectives of "Benchmarking" are "Establish guidelines and standard" and "Retain competitiveness and capabilities". Figure 2 also demonstrates a VSOG which indicates that the outcomes of the strategic objective "Cultivate outstanding manpower" are not strong or efficient enough to

Table 1. The generic model of DD-BSC horizontal strategic theme/strategic objectives gaps

Strategic theme		Strategic objectives	
Ideal	Current	Ideal	Current
Beneficiary			
Infrastructure	Infrastructure	Foster ICT adoption	Foster ICT adoption
		Increase ICT usages	Increase ICT usages
Users Satisfaction	User Satisfaction	Meet universal needs	Meet universal needs
New Technology	New Technology	Increase ICT usages	Increase ICT usages
Information Literacy	HSTG-II-P1T4	Improve users' literacy	HSOG-P1T4O1
Policy and regulation	Policy and regulation	Remove all barriers	Remove all barriers
		Amend outmoded regulations	Amend outmoded regulations
		Build users' confidence	Build users' confidence
Partnership	Partnership	Form alliance	Form alliance
Governmental Functions and Processes			
E-Strategies	E-Strategies	Provide e-services	Provide e-services
Service-S	Service	Provide better qualities	Provide better qualities
		Improve government efficiency	Improve government efficiency
E-leadership	HSTG-I-P2T3	Reengineer governmental process	HSOG-P2T3O1
		Cultivate outstanding manpower	Cultivate outstanding manpower
Nation-wide Learning and Growth			

Awareness	Awareness	Analyze strength and weakness	Analyze strength and weakness
Capabilities	Capabilities	Upgrade R&D capabilities	Upgrade R&D capabilities
		Improve users literacy	HSOG- P3T2O2
Knowledge Innovation	Knowledge Innovation	Encourage new patent	Encourage new patent
		Inspire new ideas	Inspire new ideas
Financial			
Capital	Capital	Allure foreign capital	Allure foreign capital
		Establish incentive system	Establish incentive system
		Improve investment environment	Improve investment environment
Resources	Resources	Integrate all resources	Integrate all resources
Budgeting	Budgeting	Control budget	Control budgeting

support other objectives in the Beneficiary perspective. The government should review the actions taken and make admissible corrections.

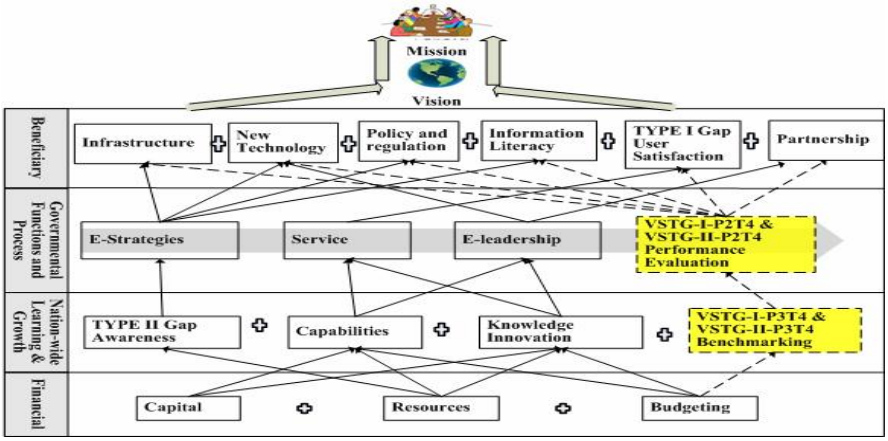

Fig. 1. The generic model of BSC-SM vertical strategic themes gaps

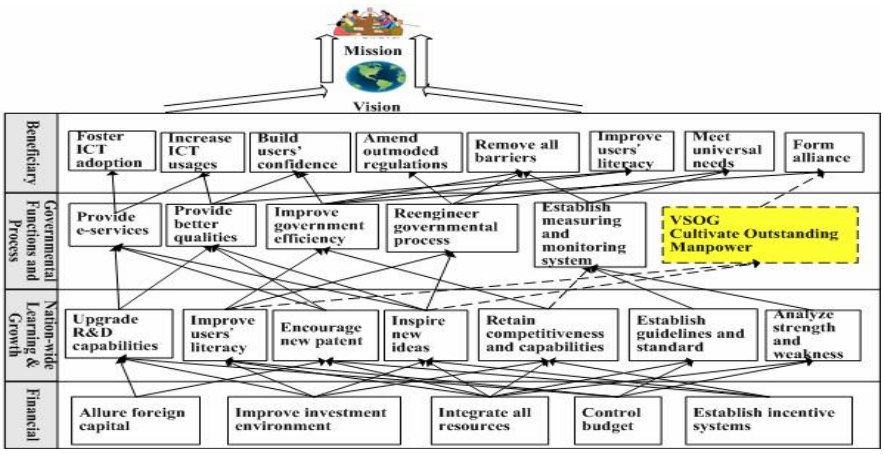

Fig. 2. The generic model of BSC-SM vertical strategic objectives gaps

5 Case Study – Analyze DD Strategic Gaps of Taiwan

In this section, we apply the four generic strategic gap models to Taiwan to demonstrate the utilization of the proposed models and approaches. Upon applying the generic models of strategic gaps to a specific nation, all the ideal themes and objectives listed in table 1, figure 1 and figure 2 are included to assure the completeness of the model. For extracting current strategic themes/objectives that are specific to Taiwan, we first gather strategies from all available resources including policies and strategies of various divisions in the central government, e-government white papers, resources on web pages of all levels of governments, the annual reports

Table 2. Horizontal DD strategic gaps of Taiwan

Perspective	Ideal ST	Current ST	Ideal SO	Current SO
Beneficiary	Infrastructure	Infrastructure	Foster ICT adoption	Foster ICT adoption
			Increase ICT usages	Increase ICT usages
	Users Satisfaction	HSTG-I-P1T2	Meet universal needs	HSOG-P1T2O1
	New Technology	New Technology	Increase ICT usages	Increase ICT usages
	Information Literacy	HSTG-II-P1T4	Improve users' literacy	HSOG-P1T4O1
	Policy and Regulation	Policy and regulation	Remove all barriers	Remove all barriers
			Amend outmoded regulations	Amend outmoded regulations
			Build users' confidence	HSOG –P1T5O3
	Partnership	Partnership	Form alliance	HSOG-P1T6O1
Governmental Functions and Processes	E-Strategies	E-Strategies	Provide e-services	Provide e-services
	Service	Service	Provide better qualities	Provide better qualities
			Improve government efficiency	HSOG-P2T3O2
	E-Leadership	HSTG-II-P2T3	Reengineer governmental process	HSOG-P2T3O1
			Cultivate outstanding manpower	Cultivate outstanding manpower
	Performance Evaluation	HSTG-I-P2T4	Establish measuring and monitoring system	HSOG-P2T4O1
Nation-wide Learning and Growth	Awareness	HSTG-I-P3T1	Analyze strength and weakness	HSOG-P3T1O1
	Capabilities	Capabilities	Upgrade R&D capabilities	Upgrade R&D capabilities
			Improve users' literacy	HSOG-P3T2O2
	Knowledge Innovation	Knowledge Creation	Encourage new patent	HSOG-P3T3O1
			Inspire new ideas	HSOG-P3T3O2
	Benchmarking	HSTG-I-P3T4	Retain competitiveness and capabilities	HSOG-P3T4O1
			Establish guidelines and standard	HSOG-P3T4O2
			Establish distinguishing features	HSOG-P3T4O3
Financial	Capital	Capital	Allure foreign capital	Allure foreign capital
			Improve investment environment	Improve investment environment
	Resources	HSTG-II-P4T2	Integrate all resources	HSOG-P4T2O1
			Promote cross-nation cooperation	HSOG-P4T2O2
	Budgeting	HSTG-II-P4T3	Control budget	HSOG- P4T3O1
			Establish incentive systems	Establish incentive systems

of the task force of digital divide, as well as the reports published by numerous DD-related seminars or colloquiums. After analyzing the strategic themes and strategic objectives of Taiwan, we have located four TYPE I and four TYPE II horizontal ST gaps, and seventeen HSOGs (as shown in table 2). In the table, "Users Satisfaction", "Performance Evaluation", "Awareness" and "Benchmarking" are indicated HSGT-I gaps due to that they are missing in the strategies collected. For "Information Literacy", "E-Leadership", "Resources" and "Budgeting", the meanings and the functions of these strategies are not clearly defined, and therefore HSTG-II gaps are placed. Taking "Information Literacy" as an example, the Ministry of the Interior and the Ministry of the Education are responsible for improving information literacy, however, according to the members in the task force of digital divide, the focuses of the related strategies are considered too narrow and the objectives focus mostly on improving the operations instead of solving problems. Therefore, HSTG-II-P1T4 and HSOG-P1T4O1 are placed in the corresponding cells. "Build users' confidence", "Form alliance", "Meet universal needs", "Improve government efficiency", "Reengineer governmental process", "Encourage new patent", "Inspire new ideas" and "Retain competitiveness and capabilities", "Establish measuring and monitoring system", "Analyze strength and weakness", "Establish guidelines and standard" as well as "Control budget" are marked the HSOGs due to the lack of explicit representation of relationships between themes and their objectives, and the lack of definite directions to accomplish the objectives. The objectives (with check mark) "Establish distinguishing features" and "Promote cross-nation cooperation" are important for Taiwan due to the geographical and economic situations, but the RDEC (Research, Development, and Evaluation Commission, Executive Yuan) report indicates the needs of more specified objectives and concrete actions. In addition, the results of "Integrating Resources", which are projects initiated by the Ministry of Transportation and Communications, are considered ineffective and the objectives need to be amended. Therefore, HSOGs are marked for these three strategic objectives. Although eight HSTGs are located in the case of Taiwan, no new theme has been added. The generic model of BSC-SM VSTG is transposed entirely to the case of Taiwan but no such gap is located.

Three VSOGs are determined as shown in figure 3. "Establish distinguishing features", "Promote cross-nation cooperation" are marked VSOGs for reminding the government of establishing logical links between Nation-wide Learning and Growth and Governmental Functions and Processes perspectives, as well as between Financial and Nation-wide Learning and Growth perspectives. "Integrate all resources" is marked a gap since the objective is not strong enough to support objectives in the upper level perspective.

6 Concluding Remarks and Future Studies

In this paper, four generic strategic gap models and steps for determining DD project-related strategic gaps based on the BSC and SM are proposed. Totally speaking, this research presents some important contributions in the following aspects: (1) delivering a guideline for understanding, conducting, and managing the strategy formulation process, (2) providing an adaptable method and procedure for locating horizontal and vertical strategic theme as well as strategic objective gaps, and (3) providing a generalized DD strategy framework for positioning a specific country and for comparing multiple countries regarding DD status and efforts. By adopting the proposed approach, the government will be able to comprehend weaknesses and shortcomings in strategy development via locating strategic gaps, and to go a step further by taking corrective actions. A case of Taiwan is used to test and validate the generic strategic gap models and the strategic gap analysis process. The result of the case study has proved the proposed BSC-SM based strategic gap analysis approach to be practically efficient and effective. In the future research works, more field experiments and validations will be conducted. In addition, gap analysis issues and methods focusing on determining gaps between strategic objectives, performance indicators, and actual outcomes will be further explored.

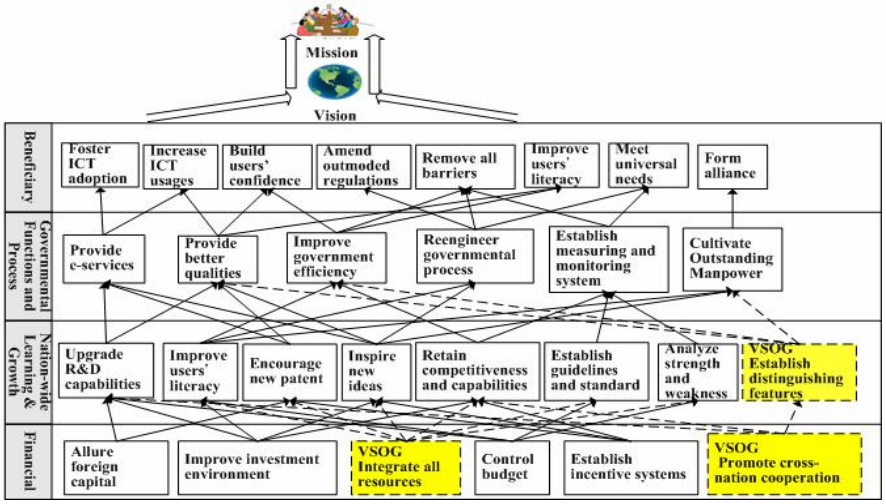

Fig. 3. The BSC-SM model of vertical strategic objectives gaps of Taiwan

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