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DEVELOPING STRATEGY MAPS FOR THE FORMULATION OF DIGITAL DIVIDES STRATEGIES

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ABSTRACT

Prior investigations commented that almost no country is completely ready to bridge digital divide due to the absence of the balance between strategizing, coordination and action. In the e-government sector, the links among strategic objectives, action plans, and performance measures related to strategies for reducing digital divides had been constantly overlooked. This paper aims at adopting and combining the concepts of strategy map and the balanced scorecard to fill up the absences. A generic model of digital divide strategy maps is presented and the steps of developing strategy maps are illustrated in detail as well.

INTRODUCTION

As the internet dominates most of the activities of human lives, governments and businesses have tried their best to take advantages of the advanced information and communication technology (ICT) to offer better services as well as to improve the service qualities. On the other hand, accompanying with the fast ICT development, side effects also emerge from phases of economic, social and even political developments and operations. Governmental policy towards digitalization might provide more opportunities for citizens to access digital equipments and contents, but in the meantime, it might also widen the digital gaps among social groups in accessing and utilizing ICT environment and applications [23]. The literatures have indicated that the development of digitalization and the generation of digital gaps are in the contrary manners [12][23][29][31][32]. For specifying digital gaps, the term Digital Divide (DD) refers to the inequality of each individual or party sharing the benefits from digitalization [25].

In fact, investigation commented that almost no country is completely ready to bridge DD due to the absence of the balance between strategizing, coordination and action [2][4][30]. Ambiguous strategies coupled with the independence of the strategies and actual actions will make the efforts towards reducing DD more difficult, and the success of converting digital divide into digital opportunity will surely be stalled. In order to mesh the objectives, actions and finally the performances with strategies, adopting or adapting suitable strategic management approach for directing the strategy formulation and performance evaluation processes is essential. Moreover, the lack of an appropriate strategic management methodology in the public sector is another reason why DD strategic efforts have often been hung back in practice.

Aiming at filling the literature absence, we adapted and integrated the balanced scorecard (BSC) and the strategy map methods to form an effective platform for DD strategic management. The balance scorecard has been considered as effective approaches for strategic management [9] and has emerged its successful implementations in the public sector [1][18][19][20]. To illustrate the logics of the strategies in a simple and understandable way, building the strategy map is the most significant step on developing the BSC, The BSC then complements the strategy maps by providing the targets, initiatives, and measures to gauge success on the strategic objectives [24].

The rest of this paper is organized as follows. Section 2 reviews the concept of strategic management, the BSC, and the strategy maps. In addition, we explain why the BSC and the strategy map are integrated to form the platform for redeeming DD strategies. Section 3 describes the steps for developing DD strategy maps. The models generated from each step are considered the generic models. In section four, the models are applied to Taiwan. The last section contains summaries and concluding remarks.

LITERATURE REVIEW

The Strategic Management

The purpose of strategic management is to harmonize all resources regardless of tangible or intangible, financial or non-financial, human or material assets. Strategic management should involve not only an effective strategic planning system but also strategic thinking [21], and strategic thinking should precede strategic planning [11]. Moreover, the actual implementation of strategies and the evaluation of strategy effectiveness are believed to be the momentum and passage a business/organization move toward achieving its goals [3]. Thus apparently, strategic management consists of four important phases including strategic thinking, strategic planning, the execution and the evaluation of strategy performances. Strategic thinking envisions the future and aims at discovering the paths that will lead to the future ends. Strategic thinker is always thought to be more inventive and creative. Whether a strategy is effective or not is determined by its relevance to the issues that are to be dealt with. To ensure the qualities and effectiveness of the strategies, the strategic thinker should probe into the issues omni-directionally. Basically the concept of strategic planning is to help management specifying strategic objectives effectively, formulating strategies, and allocating

resources for those formulated strategies. It was expected to improve the outcome of strategic thinking and to specify strategic objectives as well as to develop actionable plans [11].

Regarding the development of strategies for minimizing digital divide, the missions and activities of DD related strategic planning should be extended in several ways. First of all, the scopes and models of DD assessment should be fully specified, which was identified as one of the shortcomings in the previous DD research works [30]. Secondly, the perceptions and expectations of citizens, customers, employees, businesses, and government agencies, as well as the avenues to improve the organizational and national learning for reducing DD should all be considered. Thirdly, DD strategy planners should fully understand the actual objectives of each strategy and establish the cause-and-effect relationships among strategic objectives and action plans. In the final two steps, major tasks are to implement and to evaluate strategic plans.

Earlier strategic management techniques emerged different shortcomings. For example, Hoshin, developed in the mid-1960s and later evolved into total quality management (TQM), were either more financially or process oriented [8]. [22] indicated that the institutional research and radical learning approaches were lack of stability and cohesiveness in performance measurement; the multidimensional stakeholder approaches were not linked to long-term performance aspects and to strategic priorities and objectives as well. The SWOT (strength, weakness, opportunity and threat) focuses on the process of the formulation of strategies and does not serve sufficiently establishing the interrelationships among strategies.

The Balanced Scorecard

The BSC was first introduced by Kaplan and Norton in 1992. It then has been recognized by industries and governments as one of the most adopted tools in introducing process reengineering and pursuing organizational competitiveness [6][7][10][28]. The BSC, when used in the business domain, contains four controllable perspectives, including financial, customer, internal process, as well as learning and growth. In the beginning, the BSC was thought to be a new performance measurement system, only its views were multifaceted. Kaplan and Norton argued that the BSC is by no means a substitution for an organization's existing measurement system, but should be deemed a new strategic management tool for translating strategies into results [14].

Niven explained, and might be the most proper illustration, that the BSC was indeed covering three subjects, namely the measurement system, the strategy management system, and the communication tool respectively [24]. Moreover, the BSC is characterized by (1) its clarification of the strategies and consistence of agreement, (2) its opportunities to broadcast and communicate the vision of the organization, (3) its parallelism between the strategies and the organization or individuals goals, (4) its cooperation with the budget and non-financial goals of an organization, and (5) its valuable feedbacks obtained from a continuous reviewing process [26]. These characteristics are equally meaningful when the BSC is applied to the business or the public sectors.

Kaplan and Norton found in their research that, although most non-profit organizations or governments always documented their strategies well, they did not fully understand how and what they were able to achieve [16]. This same problem is also shown in the efforts of reducing digital divide. In other words, showing the links between strategic objectives, actions, and finally the performances of DD strategies remain as a challenge to all DD related policy makers and researchers.

The Strategy Maps

Strategies are in fact the hypotheses of causes and effects. Each strategy has its own objectives and the strategy is to be translated into real actions to accomplish these goals. As causalities are clearly explained, the strategies can be carried out smoothly [14]. The strategy map specifies cause-and-effect relationships between organization's present positions and desirable future positions [15]. It aims at linking all potential activities together to achieve the visions and missions of the organization [13]. The purpose and the imprints of strategic thinking can then be found upon developing strategy map. In addition, the effectiveness of strategic management is usually finalized by examining the outcomes of a performance measurement system. Adopting the strategy map can be expected to help ensuring the tightly relations between identified performance indicators and proposed strategies.

Although the applications of the BSC are varied in the literatures, the steps to develop strategy maps can be summarized as follows [17][24][27]:

1. Identifying visions and missions. The visions illustrate the future position of the organization. The missions indicate what the organization bears in order to achieve the visions.
2. Identifying key success factors (KSFs). Based on the visions and missions, the next process should then involve identifying critical success factors to guide the organization making proper endeavors, and to ensure the achievement of future organizational goals. The KSFs that aim at similar targets are further grouped together.
3. Defining BSC perspectives. Once the key success factors are identified, the BSC perspectives can then be determined, named and defined to match the classes of the KSFs as well as to fit the divergence of the contexts.
4. Modeling chains of cause-and-effect. Cause-and-effect links are a series of if-then statements that explore all possible activities towards achieving the strategic objectives. The links are to be identified first within and then between the BSC perspectives.
5. Design strategy maps to show the cause-and-effect links among strategies.
6. Reviewing and refining strategy maps. At this stage, we ask questions such as: Are the strategy maps complete? Are the links seemed logical? Will the links lead to achieving the objectives? Are the links too complicate to understand? etc.

DEVELOPING STRATEGY MAPS FOR REDUCING DD

Identifying Visions And Missions

In order to identify the generalized vision and missions for bridging DD, this research collected and analyzed the secondary data. Visions and missions that were documented in the research papers, official reports of well-known international institutions as well as white papers of the outstanding countries in terms of their performances in the DD efforts are collected.

Recall that mission explains why an organization exists and in the meantime, mission leads all activities toward a more definite direction. Vision is, on the other hand, a brief statement which confines the mid-to-long term objectives of an organization within the extent of reasonable and understandable [14]. After analyzing the collected data, we notice that the missions for reducing DD could be grouped into four categories. Firstly, all the chosen countries and the international organizations have recognized that the major responsibility to bridge DD is to ensure the potent infrastructure of ICTs. For example, APEC asserted that environment for infrastructure investment and technology development should be facilitated; World Summit of Information Society (WSIS) takes the improvement of the infrastructure as its first mission; Japan and Korea tried to establish their profile in the international information industry by galloping the development of ICTs. Secondly, the missions guarantee that the IT infrastructure would be spread to every corner and each individual would have the accessibility to ICTs. For example, the report of the Bridge.org emphasizes the empowerment of the underserved populations with ICT; WSIS pays attention to the requirements and the needs of all users; one of the missions of Infocomm Development Authority (IDA) of Singapore is to empower the disabled, etc. Thirdly, most countries and the organizations consider that constructing a well-formed information society is also an important mission to bridge digital divide. The missions include "enhance human capacity building and promote entrepreneurship" (Bridges.org), "create digitally literal Europe" (EU), "enhance the education of information" (WSIS), "upgrade to a more enabling environment" (Japan) and "create good environments for innovative practices" (Sweden). Finally, the mission of bridging digital divide is also set to improve the competitiveness of a nation. For instance, APEC advises its members to create an environment for strengthening of market structures and institutions; OECD encourages the sharing of members' experiences with the "new economy"; Korea wants to facilitate the market entry of tech companies in Southeast Asia; Demark promotes effective ICT markets via competition and innovation.

The four categories are in consistent with the integrated framework for analyzing domestic and international digital divide proposed by [30]. The framework consists of four dimensions namely ICT, equal opportunities, information society as well as national competitiveness, respectively [30]. In order to further categorize the missions into the four DD dimension, this research analyzes each of the mission. The approaches are first, each mission is parsed so that the mission statement is clearer and contains only one task. For example, the mission "Ensure consumer trust and strengthen social cohesion" is divided into two missions. We then compare the mission with the definitions as well as the criteria of the DD four dimensions.

By examining the missions compiled by this research, we notice that the governments are expected to utilize the ICTs in everyway to provide their people the equal opportunities to access to all the e-services, to benefit from digitalization and to leverage national capabilities and competitiveness. In conclusion, the missions of bridging digital divide are "to integrate ICT into society in an equal, effective, sustainable way to improve human lives, to advance the quality of the information society, and to gain more competitiveness". The four dimensions are explicitly stated in the mission statement.

Unlike the for-profit organizations, the determinants of governmental success are not solely related to profits but to the ability of innovation, the ability to compete with other countries, the potential to make progress, as well as the ability to provide people with minimum requirements of life and better quality of services. Finally, this research concludes that the vision of bridging DD is to "form an information society that provides the real access to information; that is built with knowledge; that is filled with digital opportunities; that captures the benefits of new emerging economy and utimately, the digital divide is bridged".

Identifying Key Successful Factors

To identify the KSFs, this research collects all the factors, which have been documented or suggested in the literatures, in regard to their critical impacts on the success or failure of bridging DD. Finding and gathering KSFs would provide a comprehensive structure to examine the performances of an organization [28] and is one of the important procedures in architecting strategy maps [6]. Once the KSFs are determined, the organization has more definite objectives and knows what strategies should be initiated. The strategies are translated into actual action, the KSFs will monitor if the actions are on the right track and in turn, the actions will always master the KSFs and magnify the impacts of the KSFs and furthermore, to achieve toward the objectives.

However, during the analysis, although the objectives are listed, the mappings between the objectives and the KSFs are not clear. To redress the shortcomings, the KSFs are further analyzed and compiled. To establish the logic links between the KSFs and the DD dimensions, we regroup the KSFs based on the criteria defined in the DD four dimensions. We further notice that the objectives of the collected DD strategies are compendium and are difficult to actually mesh with the KSFs. This research fills up this gap by analyzing the objectives, comparing them with the missions as well as the KSFs and elaborates the objectives.

Defining Proper Perspectives And Their Contents

To reduce digital divide, governments have to comprehend the following themes:

1. Which group(s) should own the opportunities to benefit from digitalization?
2. What actions should government takes to magnify the opportunities?
3. How would government do to strengthen itself, and in turn, to initiate more respectable actions and projects.
4. What and how resources government should be integrated in order to support all the programmes.

To answer the first question, apparently civilians, businesses as well as the governments themselves are the groups that will be benefited from digitalization. They are referred as the "Beneficiaries". The missions in this perspective indicate that the governments would take proper actions to advance the economy as well as to gain more competitiveness by taking advantages of the impacts of the development of ICTs. Secondly, the governments have to upgrade their functions and reengineer their processes to magnify the opportunities to succeed. Hence, the first purpose of the second perspective is to retain and excel governmental functions. The second purpose is to propose tactics that would promote and to leverage the performances of a government and in turn, to create advantages for beneficiaries to a better state [31]. This perspective is named "Governmental Functions and Processes". A nation needs uninterrupted learning to retain its competitiveness. The third perspective is named "Nation-Wide Learning and Growth" perspective. This perspective provides governments the chances to retrospect their national capabilities and functional productivities so that the qualities of the ICT and the literacy of the society would be improved. Finally, the "Financial" perspective is always necessary whatever the application is upon applying the BSC. To support all the projects that will be taken to reduce DD, the missions include seeking for new resources, looking for international opportunities and integrating all the resources.

In summary, this research proposes four perspectives namely Beneficiary, Governmental Functions and Processes, Nation-Wide Learning and Growth, and Financial. In the issue of reducing DD, the governments or international organizations bear more responsibilities [3]. Therefore, the BSC is adapted to fit non-profit organizations and public sectors. In the non-profit organizations or public sectors, to provide the best services and gain the most interests for their customers are more essential than making profits. Hence, unlike the traditional BSC, the "Beneficiary Perspective" is elevated to the first level.

The next step is to initiate effective strategies for each perspective. The strategies should be critical [17], meaning that once a strategy is selected, it is expected to create substantial values [24]. In addition, although there might be hundreds of strategies, most of the strategies aim at the same purpose. Therefore, most of the strategies can be rephrased by a few strategic themes that are simple and easy to understand [5] and the name of the strategic theme always consists of a verb and a noun [24]. Based on the rules, this research first collects the famous actions that have been actually implemented by the aforementioned countries and international organizations. The objectives of these actions are analyzed and compared with the missions, KSFs, as well as the objectives of the KSFs to determine the appropriate strategic themes and the strategic objectives.

Table 1 integrates the results from each step and form a complete DD-BSC. The missions, strategy themes, strategic objectives as well as the KSFs are homed into the proper grid. Each of the DD dimension carries it missions; the missions drive the initiation of the strategies; each strategy has its strategic objectives and the strategy is implemented by appropriate actions to achieve the objectives; the performances however, are evaluated by the critical success factors. To conform to the constitution of the BSC, the DD dimension will not be shown in the DD-BSC framework in the rest of the research, nevertheless, by following the steps proposed in this research, it is easier to trace back of what the strategies are and how they should be carried out and be evaluated.

Modeling Chains of Cause-And-Effect And Constructing The Strategy Map

As stated before, strategies are the hypotheses of causes and effects, and can be expressed by a series of if-then statements. The if-then logics should be established before making the strategy map, and furthermore, the logics are identified both within and between the perspectives. [30] indicates that in the integrated DD framework, ICTs lays the foundation of the other three dimensions; and once the ideal of equal opportunities have been reached and information society is well formed, a nation will own more competitive advantages. Therefore, in the strategy map, ICTs strategies are placed at the lowest level of each perspective in the DD-BSC framework and the logics between strategic themes will be established accordingly and easily. The if-then logics of strategies within and across each perspective are described below:

Beneficiary perspective: If users are satisfied with the advanced infrastructures and new technologies, the governments would then ensure the diffusion of ICTs; thereby, information literacy will be upgraded and information content will be improved. Furthermore, a nation will have more confidence and opportunities to cooperate with other countries and establish partnership.

Governmental functions and processes perspective: If governments put more efforts on impetus new technologies, providing diversify services and amending market-based policies, they would foster the equity among societies and promote their own capabilities. In turn, the governments will build stronger administration, to transform into a leader and gain more competitiveness.

Nation-wide learning and growth perspective: If governments continue optimizing ICTs infrastructures and industries, they would be aware of its potential and opportunities. In turn, it would be easier to set benchmarks and take proper actions to revitalize IT and social structures as well as to provide overall opportunities. Surely, the merits of multilateral co operations will be doubled.

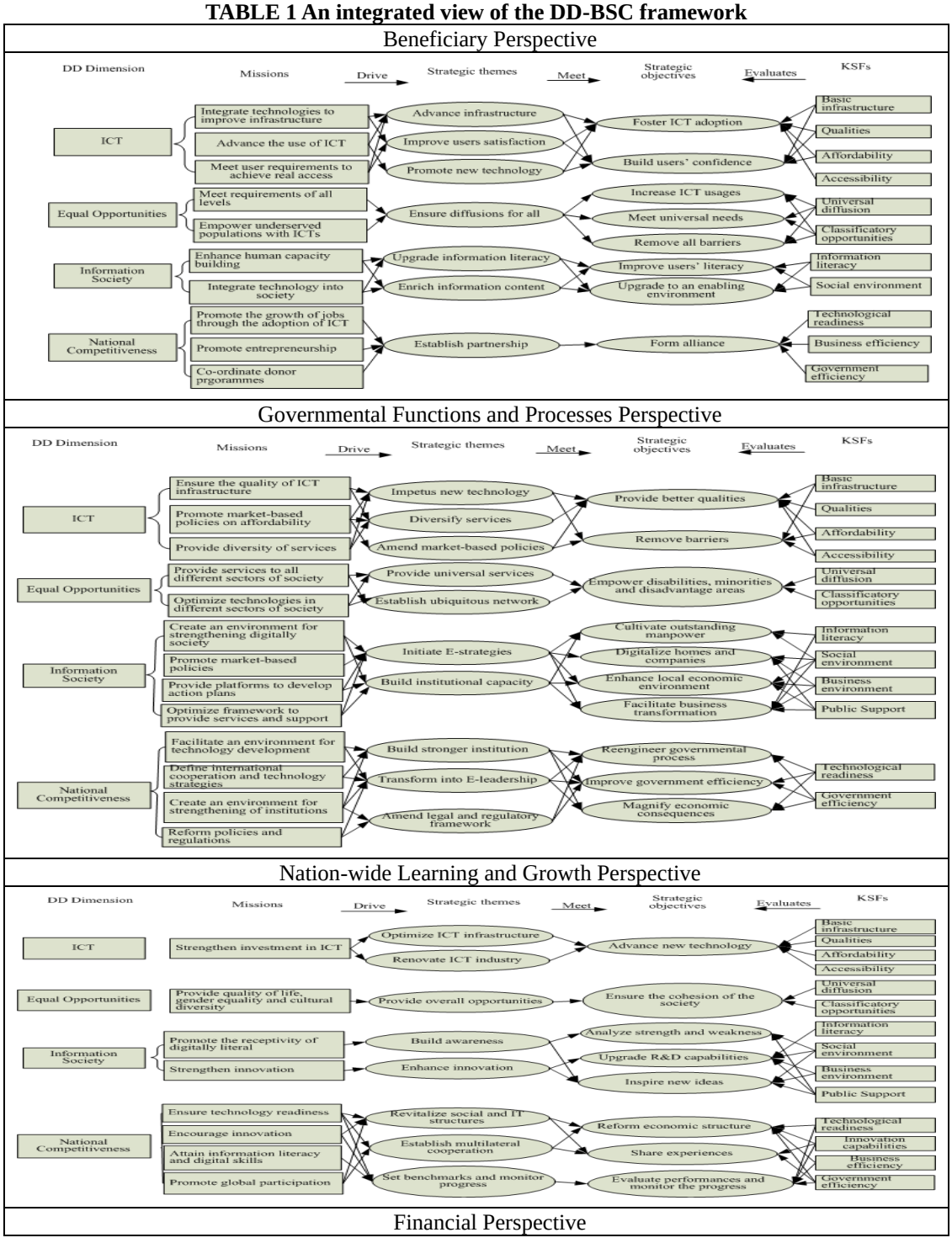
Financial perspective: If the governments could control budget and amend outmoded laws, it will smooth the promotion of and establishing incentive systems. They will also facilitate the implementation of reviewing pricing system, promoting international co operations and integrating resources. Eventually, the infrastructure would be upgraded to speed the entry to the market of the ICT industry and to accumulate the economic strength of the country.

Based on the if-then relationships, this research presents the strategy map as shown in figure 1. Figure 1 also demonstrates the if-then relationships across perspectives. Although we have referred to the four perspectives in the order of "Beneficiary", "Governmental Functions and Processes", "Nation-wide Learning and Growth" and "Financial", "Financial" perspective is the first perspective to be explained wile establishing the logical links between perspectives. Basically, all the strategies in each perspective certify the fulfillment of the missions of that perspective. The arrows at the right of each perspective indicate that if the strategies in a perspective are well performed, the perspective would support and smooth the implementations of the

strategies at the upper-level perspectives as well.

In addition, some of the strategies have direct effects on the implementations of the strategies at the upper-level perspectives. For example, if the outcomes of "Initiate E-strategies" and "Build institutional capacity" in the "Governmental Functions and Processes" perspective are superior, it will expand the opportunity to "Establish partnership". If "Impetus new technology", "Diversify services" and "Amend market-based policies" in the "Governmental Functions and Processes" perspective are well executed, they will provide more advantages for beneficiaries on adopting the ICTs. If the governments are aware of "Provide overall opportunities" would ensure the cohesion of the society, the efforts they put would then upgrade universal services and provide more chances to establish ubiquitous network. "Building awareness" as well as "Enhance innovation" in the "Nation-wide Learning and Growth" perspective will smooth the implementation of "Initiate E-strategies" and "Build institutional capacity". "Promote international cooperation" and "Reviewing pricing system" in the "Financial" perspective supply more power to implement "Provide overall opportunities" strategy in the "Nation-wide Learning and Growth" perspective as well.

TABLE 1 An integrated view of the DD-BSC framework



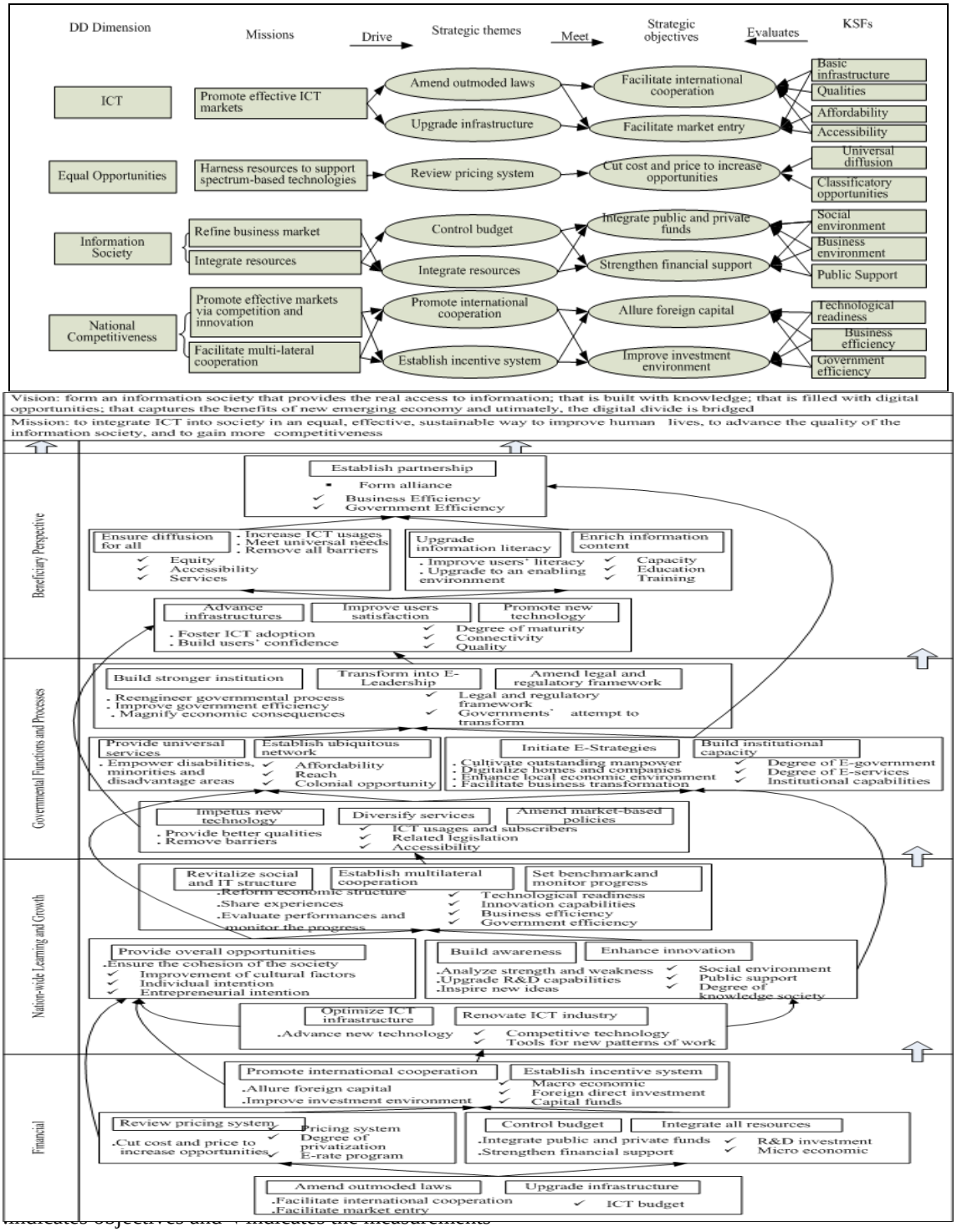


FIGURE 1 The generic model of DD-BSC strategy map

THE CASE OF TAIWAN

The outcomes generated from each step are considered general to all countries. A nation is suggested taking the generic models as the foundation and developing its own DD strategy maps. In the case of Taiwan, the four dimensions and the four perspectives in the DD-BSC framework are entirely applied to Taiwan. According to the Research, Development and Evaluation Commission (RDEC, Executive Yuan of Taiwan), the vision of bridging DD at Taiwan is to "Bridge digital divide, create digital opportunities". We notice that the vision is already covered in the generic model. The mission documented in RDEC is the same as what has stated in the generic model, i.e. "to integrate ICT into society in an equal, effective, sustainable way to improve human lives, to advance the quality of the information society, and to gain more competitiveness". Since the generic models are taken as the foundation, it is much easier to classify the strategies into a perspective. Figure 2 shows the links both within and between the perspectives. The oval indicates that the strategy "Evaluate performance" is specific to Taiwan and is not included in the generic model. After comparing the strategies, the objectives and the strategy maps of Taiwan with the generic models, the following facts are revealed:

1. Missing strategies. The ideal strategies are not found in the case of Taiwan. For instance, in the "Governmental Functions and Processes" perspective, strategy "Build stronger institution" is not documented.
2. Specific strategies. The strategies are not listed in the generic model but are specific to Taiwan. For example, a merit system to review the performances of public servants has been in operation in Taiwan for years. The strategy "Evaluate performance" (represented by oval in figure 2) is listed in the "Governmental Functions and Processes" perspective.
3. Objectives are not clear. For example, the objectives of the strategy "Set benchmark" in the "Nation-wide Learning and Growth" perspective indicate that although Taiwan has the same strategy as most of the other countries, the objectives in the generic model are not fully documented in the case of Taiwan. As a result, the government of Taiwan may overlook the problems and not to take proper actions in time.
4. Specific objectives. The objectives are recorded in the documents of Taiwan and are specific to Taiwan. Such as "Provide E-services" of "Diversify services" in the "Governmental Functions and Processes" perspective.

The strategies and objectives in the generic maps are extracted from selected countries and international organizations; they indicate the unified opinions in terms of reducing digital divide. Still, it will not be appropriate to conclude that the generic maps are thorough or the strategy maps of Taiwan are inadequate. Further studies will need to reexamine the strategy maps with more qualified approach.

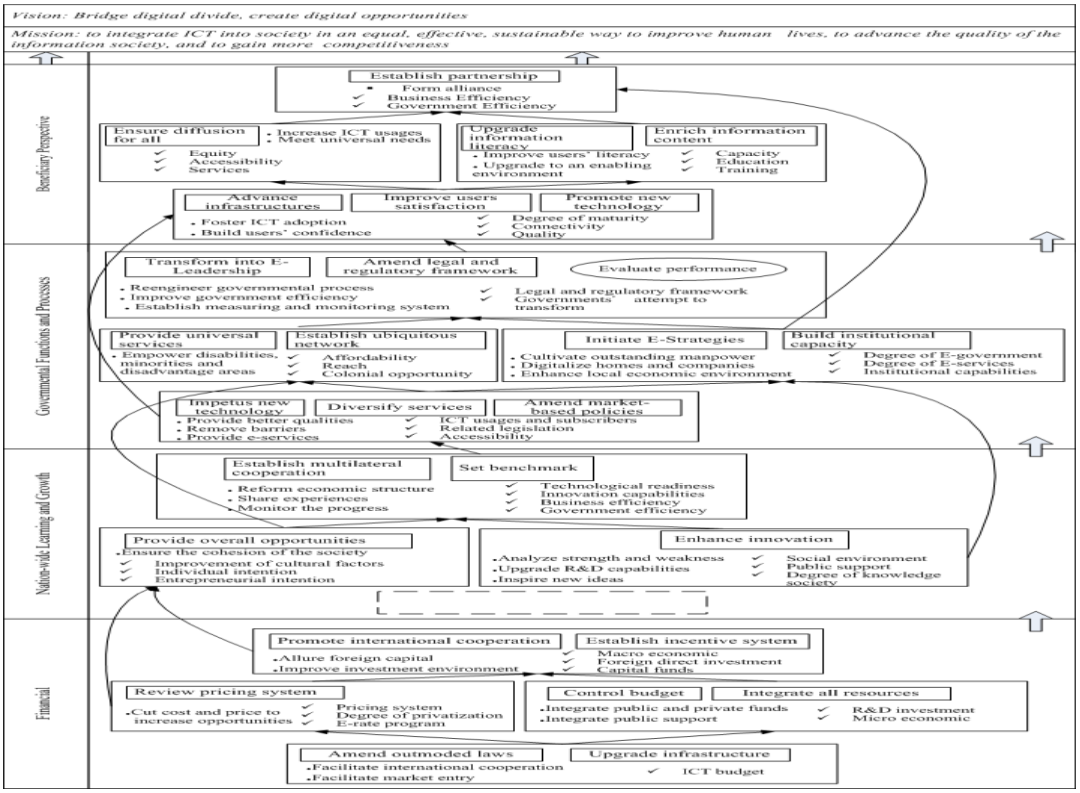


FIGURE 2 The strategy map of Taiwan

CONCLUSIONS

This research contributes the following findings of our work:

1. Research findings suggested that governments are conscious of the laggard improvements on minimizing digital divides and have tried to work towards achieving the targets set, however, the first stage failed to identify a clear vision and recognize what the missions are. This research analyzed the needs and the previous works of many countries and international organizations and declared the vision and missions of bridging DD with a statement that was brief but complete and easy to understand.
2. Although the strategies, the strategic objectives as well as the KSFs in the generic models were documented in the documents as well as the research papers this research collected, the linkage between strategies, objectives and the KSFs are not established. As a result, the government would double the efforts but gain the minimum returns. The results would not be evaluated properly and the major causes of failure would not be identified. This research closes the gaps by proposing the integrated view model of the relationships of vision, mission, KSFs, strategy and strategic objectives, and the strategy maps to show the cause-and-effect relationships between strategies within a DD-BSC perspective and across perspectives as well.
3. The actual application of the models generated in this research reveals two facts. First, the steps of the development of the strategy maps are presented in orderliness; they pave an unhindered and correct way for the government to develop their own DD-BSC and the strategy maps. Second, the generic models can be adopted as the contrast. Any missing strategy or flawed objective would be identified easily.

4. No matter in the generic or specific strategy maps, although the links were established, they were linked according to what had been done or had been documented. However, do the strategies cover the whole spectrum of DD? Are the objectives faithfully reflecting the real problems? The strategy maps emerge gaps both in the case of Taiwan and in the generic models.

In this paper we adapted the BSC approach to link government strategies for reducing DD. The templates of strategy maps have been constructed to bridge the gaps between strategies and objectives. The ideas and results of this research contributes to the literatures and practices in several aspects including steering policy makers toward more logical thinking about strategic planning, to supply government a blueprint for governing the programmes of reducing DD; and to provide mechanism for examining and reevaluating the effects of DD strategies and projects. The research also conducted a case study based on the template of strategy maps. The purpose was to adapt the proposed strategy maps so that it would fit the actual status of Taiwan. The actual application showed that by following the steps and the generic models this research generated, it would be much easier and save a lot of time on developing the own DD-BSC for a nation. Nevertheless, as stated in the research findings, gaps might be concealed for various reasons. Proposing a powerful means to identify and evaluate the gaps, to adjust the strategies and objectives as well as to refine the strategy maps are in strong desire. Further studies will focus on constructing and presenting an acceptable tool to fill up the absences. In addition, how to transform the KSFs collected in this research into a measurement tool so that the performances of the strategies could be monitored and reviewed is another important lesson.

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