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# Establishing Interagency Collaboration in Large-Scale Systems Development: Lessons Learned from an E-government Project for Trade and Transport Facilitation

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# Establishing Interagency Collaboration in Large-Scale Systems Development:

## Lessons Learned from an E-government Project for Trade and Transport Facilitation

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**ABSTRACT**

Based on recommendations of various international and intergovernmental bodies, many countries have adopted the concept of an Internet-based "Single Window" with an expectation that it would allow seamless G2G, G2B, B2G, and B2B information exchange within and across borders to enhance the facilitation of the international trade. The implementation of such effort requires unprecedented interagency collaboration which is seen as an unnatural act between non-consenting agents. To gain insights on how the interagency collaborative platform is established and maintained, we participate in the large-scale e-government project for trade and transport facilitation in Thailand, examine activities that have been carried out during the first phases, and assist the establishment of a collaborative relationship. From our study, we generate lessons learned that offer some practical ideas for policy-makers and project managers as well as issues for future research.

**Keywords (Required)**

Interagency collaboration, systems development, e-business, e-government.

**INTRODUCTION**

International supply chain encompasses activities related to the ordering of goods, the physical transfer of the goods, and the payment for the goods (UNECE, 2001). It involves a large number of stakeholders including customers, suppliers of goods from various industries, intermediaries whom are known as commercial, financial, transport or insurance service providers, and a number of government agencies from at least two trading economies (UNECE, 2001). Recognizing that information integration and sharing is a key element to improve international supply chain's efficiency and effectiveness, many governments have adopted the distributed architectural concept of an Internet-based "Single Window" (APEC, 2007; ASEAN, 2005; UNECE, 2004; WCO, 2005).

The most commonly applied definition is given by the United Nations Center for Trade Facilitation and Electronic Business (UN/CEFACT). A Single Window is a single entry point that allows parties involved in the international supply chain to submit trade and transport information in a standardized format to fulfill all import, export, and transit-related regulatory requirements (UNECE, 2004). For the Association of Southeast Asian Nations (ASEAN) Single Window Taskforce (2005), however, trade and transport information can be submitted through different channels but any identical piece of information is submitted only once. ASEAN's definition of the Single Window at a national level is also extended to cover "a single and synchronous processing of data and information and a single decision making for customs release and clearance" (ASEAN, 2005).

Such system faces overwhelming implementation challenges due to its interorganizational nature and many stakeholders' involvement. Complicated challenges include ones that are related to organizational, managerial, financial, legal, and political aspects (Aichholzer and Schmutzer, 2002; Gil-Garcia and Pardo, 2005). The challenges are normally associated with establishing political will, gaining management commitment and full support, creating an institutional platform for collaboration, managing stakeholders' expectations and perceptions, deriving acceptable business and architectural models, and conducting necessary business and regulatory reforms.

Our study focuses on the organizational and managerial aspects of a large-scale e-government project during its initiation and requirements elicitation and analysis phase. Issues related to the establishment of interagency collaboration are of primary concern. To gain insights on how the interagency collaborative platform is established and maintained, we follow an action research approach. As action researchers and lead consultants of the project, not only we assist the government of Thailand in establishing collaborative relationship among stakeholders of the project, but we also extend our knowledge in this area. In line with Blum (1955), we examined activities that had been carried out to foster the process of interagency collaboration, identify potential problems, develop possible solutions, and introduce them to improve the situation.

We first discuss the concept of interagency collaboration, a process in establishing the collaborative platform, and issues that have to be taken into account at each step. We next introduce the business case, i.e., Thailand's Single-Window e-Logistics project. Discussion on interagency collaboration, practical ideas for policy-makers and project managers, and issues for future research follows.

## ISSUES IN INTERAGENCY COLLABORATION

There is no standard definition for collaboration. The term has been used interchangeably with cooperation and coordination. According to Brewer (1999), these terms differ in the intensity of participation and effort as well as the extent to which participating agencies are connected in terms of vision, goals, power, resources, responsibility and accountability. It is the collaboration that represents the highest form of connectedness and participation. Imel (1995) proposes a framework for setting up a linkage team to serve as a platform for interagency collaboration.[1] The framework has been used and proved to overcome several deterrents to interagency collaboration.

The first step begins when prospective stakeholders *perceive needs and climate for interagency partnership*. Perceived needs can be so spontaneous that agencies feel compelled to collaborate (e.g., a worldwide economic recession) or generated by visionary leadership (e.g., an executive order). Imel (1995) argues that the ideal perceived needs for interagency partnership are those that combine factors of human needs, public sentiment, legislative priorities, and institutional readiness.

The second step involves *the identification of the linkage team* where each prospective stakeholder looks out for potential collaborative partners. In the context of interorganizational systems development, we operationalize the linkage team as stakeholders participating in the development process and other individuals, groups or organizations whose actions can directly or indirectly influence or be influenced by the development and use of the system. They include initiators, sponsors, implementers, intended users, receivers of the outputs of the system, intended developers and operators, those who will be affected by the system; and those who will win or lose by using the system (Pouloudi and Whitley, 1997).

The third step refers to *team formulation* which occurs when there is sufficient business conditions and motivation. It involves a formal process of repetitive and simultaneous negotiating expectations, creating commitments for future action, and executing commitments where obligations and rules for future action in the relationship are passed on to relevant subordinates (Ring and van deVen, 1994). Each agency then appoints participating members based on the directives of the leading authority. Expertise that is particularly important for the development of interorganizational systems include one that is related to technical aspects of software development and one that lies in business process (Felix and Harrison, 1984).

For a team to be productive at most, it has to achieve (i) strategic integration which involves the continuous engagement and mutual commitment among high-level decision-makers; (ii) tactical integration which brings the management together to plan the implementation of the project; (iii) operational integration which involves essential elements that enable practitioners at the operational level to perform their task; (iv) interpersonal integration which builds foundation necessary for sustaining collaborative partnerships; and (v) cultural integration which includes skills and ability for stakeholders under the collaboration to bridge individual differences (Kanter, 1994).

The final step for creating interagency collaboration concerns *the establishment of a collaborative relationship*. Imel (1995) suggests that factors that contribute to collaboration include (i) regular contact through purposeful meetings; (ii) frequent communications through telephone and mail; (iii) a client-centered focus; and (iv) leadership that helps develop and maintain shared vision.

Bardach (1998) argues that objective and subjective components of participants' capacity are essential for maintaining successful collaboration. The objective components include formal agreements, resources for collaborative tasks, administrative services, and accountability associated with each task. The subjective components are individuals'

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[1] The framework includes the development and implementation of a project plan. Given that they are not the prime concern of the study, they are not included in the study.

expectations of others, and their availability and competency for delegated tasks. These expectations are built around beliefs in the legitimacy of collaborative actions, which aim towards certain goals, the readiness to act on such belief, and trust in collaborative partners (Bardach, 1998).

## THAILAND'S NATIONAL SINGLE WINDOW E-LOGISTICS

### Business Case

Thai Government prioritizes the establishment of the Single-Window e-Logistics (NSW) as a national flagship to pursue a strategic agenda on Trade Facilitation Enhancement and a vision to become the world-class logistics hub for Indochina (NESDB, 2005). As a data network for information exchange among all stakeholders in the international trade supply chain, NSW is expected to foster regional integration and realization of an ASEAN Economic Community by 2015. The Thai government and the governments of ASEAN member countries therefore signed the Agreement to establish and implement the ASEAN Single Window, requiring Thailand to put in place NSW by 2008 (ASEAN, 2005).

The measurable benefits that are expected to be achieved when the full system is in place include a reduction in average trade transaction cycle time from 24 (World Bank, 2004) to 15 days[2] and a reduction in costs of compliance with documentary requirements by 0.5% of GDP (about $US700 million annual saving) by 2010 (Keretho, 2008).

### Project Description

Thailand's NSW is designed to support a single entry of identical data; a single synchronous processing of data; a decision-making for the clearance and release of cargoes at a single point; and a compilation of statistics for economic analysis and management. Figure 1 illustrates the overall architecture of Thailand's NSW.
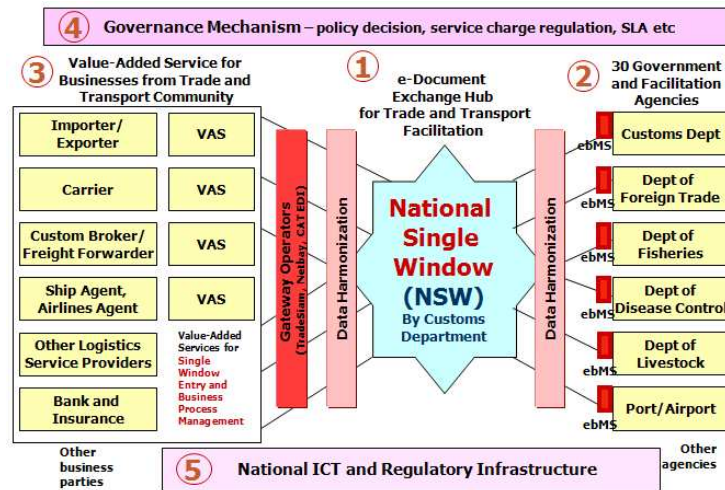


**Figure 1. Thailand's NSW Framework (Keretho, 2009)**

NSW exchange system is the first component. It serves as a hub for electronic documents sharing and exchange, especially for Government-to-Government interconnectivity. Its key features include an interface for sending and receiving messages in different protocols, syntax checks to ensure the conformity of messages, ebXML Messaging Service (ebMS) and PKI-based digital signature, and a message syntax and semantic translator.

The second component is the permit/license/certificate issuing systems of all participating parties with additional module that facilitates back-end integration and ebMS and service arrangements with the NSW central exchange hub.

Single Window Entry Features provided by value-added service providers (VAS) or gateway operators is the third component. It offers a communication interface for data submission between importers, exporters, trade/transport intermediaries and VAS. The selection of an interface is of users' preference. This component is also accompanied with the

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[2] The World Bank measures time required for exporting a standardized cargo of goods by ocean transport in calendar days. Time is counted from the contractual agreement between 2 trading partners to the delivery of goods. It is assumed that neither the exporter nor the importer wastes time and that each commits to completing each remaining procedure without delay.

business process management module that assists users from trade and transport community with procedural and documentary requirements in different phases of the international supply chain.

The last two components are policy directions for NSW implementation and operation. Examples of supporting components include criteria for the determination of transaction fee and quality of service, IT physical infrastructure, and E-Government Interoperability Framework.

Table 1 summarizes the interagency collaboration process, issues associated with each step, and key experiences regarding interagency collaboration captured from the initial phase of the NSW.

| Interagency Collaboration Process (Imel, 1995) | Issues in Interagency Collaboration | Experiences from Thailand's NSW Project |
|---|---|---|
| Step 1: Perceive needs for interagency partnership | The ideal needs are those that combine factors of human needs, public sentiment, legislative priorities, and institutional readiness. (Imel, 1995) | Need to implement the NSW system was based on economic rationale and perceived threats in the international trade. |
| Step 2: Identify stakeholders | Stakeholders include initiators, sponsors, implementers, intended users, receivers of the system's output, intended developers and operators of the system, those impacted and affected by the system, and those who will win or lose from existence of the system (Pouloudi and Whitley, 1997). | Stakeholders were identified at the project initiation phase. Business process analysis conducted after project initiation for Thailand' strategic industry sectors enabled further identification of intended users, receivers of the system's output, and intended developers/operators. Captured business processes were codified using UML Use Case diagrams. The diagrams were used as a medium to communicate with identified stakeholders for further stakeholder identification. |
| Step 3: Form the interagency team | The most productive team requires the integration at five levels (Kanter, 1994). | |
| | – Strategic integration | Strategic integration was facilitated by National Economic and Social Development Board (NESDB). It was addressed with high formality by initiators and sponsors of the system. The regional Agreement further strengthened the tie. |
| | – Tactical integration | The appointment of National Committee on Logistics Development (NCLD) was a tactical move. It brought together the high-level management to plan and monitor project implementation. The commitment at this level made stakeholders accountable to the project and obligated them to render collaboration. |
| | – Operational integration | Besides budget allocation from the government, Customs Department was designated to lead project implementation and Ministry of Information and Communication Technology (MICT) to handle project management. Working group was formed to facilitate communication and coordination on cross-organizational issues among stakeholders at the operational level. The study on the overall architecture of Thailand's NSW (Figure 1) helped clarify "what is what" and "who is doing what" thus reduced confusion. |
| | – Interpersonal integration | Lead consultant's diplomatic quality was also crucial for enlisting commitment and participation from independent agencies. |

| Interagency Collaboration Process (Imel, 1995) | Issues in Interagency Collaboration | Experiences from Thailand's NSW Project |
|---|---|---|
| | – Cultural integration | Incompatibility on broad values, principles, and strategic grounds caused the personal rivalry. Conflict avoidance approach was employed in dealing with this issue. |
| Step 4: Establish a collaborative relationship | Factors that contribute to collaboration include:<br>– Regular purposeful meetings; frequent mediated communications; client-centered focus; and leadership that promotes shared vision (Imel, 1995)<br>– Interagency collaboration capacity, i.e., formal agreements; resources; administrative services; accountability associated with each task; individuals' expectations of others; and their availability and competency for delegated tasks (Bardach, 1994) | These qualities were found throughout the setting up of the interagency collaboration for NSW implementation. |

**Table 1. Summary of Experience and Lessons Learned from Interagency Collaboration in Thailand's NSW Project**

### The Interagency Collaboration Process

Following the framework for setting up a linkage team (Imel, 1995), the National Competitiveness Development Committee (NCDC)[3] took the first step in identifying need to improve efficiency and effectiveness of the national trade and transport facilitation system. Thailand Logistics Master Plan (2005-2009) was thereafter developed to address NCDC's political will, commitment, and national long-term vision in this matter. The need was strengthened after Thailand officially signed the Agreement to Establish and Implement the ASEAN Single Window. Such political commitment created a platform for interagency collaboration and strengthened the justification for budget allocation.

After the need was perceived, most stakeholders of the NSW were identified. The Cabinet appointed National Committee on Logistics Development (NCLD). NCLD consists of permanent secretaries from economic-related Ministers and representatives from trade-related associations. NCLD's members are responsible for planning and monitoring sub-projects carried out under each ministerial boundary. While the engagement of NCDC in the project reinforced strategic integration and thus mutual commitment among high-level decision-makers, the appointment of NCLD was a tactical move. The commitment at this level made relevant stakeholders accountable to the project and obligated them to render collaboration.

National Economic and Social Development Board (NESDB) was appointed as NCDC's and NCLD's secretary. While NCDC and NCLD provided a certain level of formality to project realization, NESDB played an important role in ensuring project continuity even under the vacuum of leadership resulting from instable political situations.

The Cabinet also appointed a linkage team to lead and manage the project implementation, particularly the development of the NSW exchange system and the integration of other components with the NSW exchange system. The appointment was based on existing organizational role, responsibility, and capability. Recognizing that Customs Department possesses in-depth knowledge of the business domain and relevant technologies, the Cabinet designated Customs Department as a lead agency to coordinate/lead NSW implementation and drive the information exchange between Thailand's NSW and NSWs of other ASEAN countries. The Cabinet also designated Ministry of Information and Communication Technology (MICT) as an agency responsible for managing projects, handling allocated budget, and identifying the best appropriate business model for a smooth operation of NSW. Nevertheless, having one agency in charge of the implementation and another in charge of the project management has a disadvantage. The ministerial bureaucracy holds back budget allocation and results in project implementation delay.

As a lead agency, Customs Department initiated a working group to serve as an organizational mechanism to facilitate communication and coordination among NSW stakeholders. The working group had representatives from controlling government agencies as well as relevant trade and transport community Analysis of existing business processes was conducted to further identify intended users, receivers of the system's output, and intended developers/operators. Captured business processes were codified using UML Use Case diagrams. The diagrams were used as a medium to communicate with identified stakeholders for further stakeholder identification. Two sub-working groups were formed. One worked on

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[3] National Competitiveness Development Committee (NCDC) is a high-level committee chaired by the Prime Minister. NCDC is comprised of all economic-related Ministers as well as representatives from key industry sectors.

streamlining business processes and aligning data requirements. The other dealt with technical communication protocol and related security issues. With close communication among stakeholders, interests and expectations on the system were regularly addressed, managed and aligned by the lead agency.

The appropriate appointment of lead agencies and the formation of sub-working groups provided the foundation for operational integration. However, there was confusion on how independent agencies could function as a single entity with authorities for problem-solving. The study on the overall architecture of Thailand's NSW in Figure 1 helped clarify "what is what" and "who is doing what" thus reduce confusion. It provided a clear overall picture and common vocabularies, promoted common understanding among stakeholders, and strengthened integration at the operational level.

A lead consultant from the academia was hired by NESDB and MICT to assist the project formation and project implementation in technical and managerial aspects. As part of contracts, several high-level awareness-raising events were arranged to educate relevant parties on policy framework towards NSW and foster common understanding about the project. Those events were supplemented by informal and formal information-sharing sessions on relevant methods, tools, techniques, and standards. With better idea on benefits and positive impact of the system, affected parties were less likely to resist the project implementation. The constructive engagement and diplomatic qualities of the lead consultant such as patience, perseverance and persuasion were acknowledged as critical factors that helped create collaborative partnerships, bridge individual differences, thus enlist commitment and participation from independent agencies. Stakeholders accepted and recognized the leadership of the lead consultant not only because of his academic credibility and neutrality but also because he is a consultant authorized by NESDB and MICT. Nevertheless, disinclination to collaborate was experienced from time to time due to a personal rivalry. Placing an emphasis on a circle of influence rather than the circle of concern (Covey, 2004) was a technique used to avoid conflict and deal with individual differences.

A team of consultants was installed to undertake interagency tasks including business processes streamlining and data harmonization. These activities required a great deal of communication between consultants and designated persons-in-charge from participating agencies. The use of relevant standards shortened negotiation process. The communication sessions, where its goal was to collect procedural and data requirements and validate the documentation of the analysis outcome, were often arranged informally. Groundwork was done before the meeting to ensure effective data collection and that data collection was completed in as fewer meetings as possible.

## LESSONS LEARNED AND ISSUES FOR FUTURE RESEARCH

### Formal and Informal Aspects of Collaboration

In the project, a formal interagency collaborative platform through mandate designation was established at tactical and operational level. The establishment of NCLD and the appointment of lead agencies were a critical requirement that kept the formal collaboration working. According to Mohr, Fisher, and Neven (1996), formality refers to the extent to which the communications are routinized, planned, or structured. Formal collaboration helps align expectations and solidify commitments (Mohr et al., 1996). In contrast to Mohr et al. (1996), our case is rather unique. The collaborative communication and the level of formality were not positively correlated. The political situation in Thailand for the past five years yielded high rate of turnover in ministerial and senior-official positions. It caused an interruption in formal collaborative communication and retarded several activities required to push the implementation forward. Under such circumstances, it was the informal collaboration among stakeholders at the middle management level that enabled the project progress.

While formal information meetings among the managements of participating agencies had an important role in resolving misunderstanding, we observed that facilitating the fine-tuning of collaboration mechanisms, and keeping stakeholders informed of the project progress, informal collaboration works better when it comes to working at the operational level. Bardach (1994) argues that self-organizing relationships has the potential to promote communications and thus facilitate working relationships.

### The Importance of Client Advocates

Brewer (1999) indicates that the best informal collaborators are client advocates. He noted that client attributes such as persistent, resourceful, creative and pro-active are crucial for successful collaboration. Participants' capacity in fact has great influence on the success (Bardach, 1998).

We found similar cues. Although the consultants were hired to conduct the integrative analysis of business process and data requirements, the participating agencies shared responsibilities by providing domain knowledge and ensuring accurate documentation of analysis results. However, we encountered two frequent problems when it came to formal communication.

Firstly, many representatives of participating agencies did not have appropriate knowledge and skills for the tasks presented at the meetings. Secondly, their turnover rate was high. The budgeting process was not a factor in motivating or distracting the collaboration from participants. Besides the clear mandate, it was the perceived needs and potential benefits of the project that drove the motivation to participate.

### Impact of Sociopolitical Attributes on Collaborative Relationship

Kanter (1994) argues that although rational/economic argument and technical feasibility are necessary for building collaborative relationship, individual relationship such as personal chemistry and compatibility among all stakeholders must also be in place for such relationship to flourish and mature. We found evidence from the project that supported her argument. It occurred to us that stakeholders' incompatibility on broad values, principles, and strategic grounds was one crucial factor that caused the personal rivalry.

### Expert/Consultant as one of the Collaboration Driving Forces

Kumar and van Dissel (1996) advocate a multi-talented leader that simultaneously plays the roles of diplomat. Kanter (1994) also recognizes the role of the "third-party professionals" in fostering collaboration. In our project, the consultant from the academic was perceived by stakeholders as being professional, neutral and knowledgeable. Such qualities increased stakeholders' trust and confidence in the development approach and expected deliverables that they learned through a series of information-sharing seminars and training.

The diplomatic quality of the lead consultant from such as patience, perseverance and persuasion was another critical factor that helped enlist commitment and participation from independent agencies. Other skills found necessary include the consultant's ability to identify issues that each stakeholder is skeptical about; collate relevant information; produce a coherent picture of those issues; pinpoint issues in which decisions are needed; determine which options are available; negotiate an acceptable solution for everyone involved; and present complicated concept in an easily understandable manner (Rhodes, 1997). Given that Thai society is characterized by high uncertainty avoidance and high perception of power distance (Hofstede, 2001), conflict avoidance proved to be an effective approach to solve differences and risks of disintegration among participating agencies. Covey (2004) refers this mixture of quality as the ability to create an effective circle of influence and gradually extend it to complete a circle of concern.

### The Use of Communication-enabled Technology

The role of technology in supporting collaboration has been widely discussed in the MIS literature. Among many, Turoff et al. (1993) discussed the necessity to use technology to support information exchange and sharing. In this project, the use of electronic means, was insignificant. It was typically a one-way communication process. The comments and opinions that receiving parties had towards the message content were normally prolonged and addressed in face-to-face meetings. Full COTS tools were employed. However, they were used by the consultants in the documentation of business process models and the harmonization of cross-agency data requirements only. They were not perceived as collaborative tools.

### The Benevolent Role of Standards in Collaboration

Standards play an important role in the collaboration process. Unified Modeling Language (UML) provided standard graphical notations for documenting business process. The draft business process models were used as a medium for the consultants to communicate with relevant stakeholders to ensure the accuracy and completeness of the information collected, and to obtain feedback on how the models could be improved to reflect actual situations.

Data standards were employed as a tool to reconcile data definitions, data element names, data element representations, and data structures for used in electronic messages. The use of these data standards eased the negotiation process and enabled the consultants to rationalize and harmonize data requirements from 21 trade and transport related regulatory agencies.

### CONCLUSION

Experience from the project suggests that political will and commitment provide the foundation stone for successful project implementation along all the phases of the projects. They create a conducive environment for interagency collaboration and justification for the allocation of resources. In contrast to Noblit et al. (1999), the role of high-level policymakers in mandating is necessary. Their mandate helped remove confusion as to how independent agencies could function as a single entity with problem-solving authorities. However, mandate should be arranged with care. Having one agency in charge of the implementation and another in charge of the project management lead to operational conflicts and project implementation delay.

Formal communication was needed to promote common understanding in all issues related to project implementation and obtain greater participation from the stakeholders. However, it is not sufficient to sustain active collaboration when there is a discontinuity of the high-level leadership. Frequent informal communications among stakeholders at the middle-level management proved to be essential to mobilize collaboration.

As the stakeholders at the middle-management and operational levels may not have sufficient knowledge and time to streamline interagency requirements, it is recommended that the consultants as the third-party professionals are employed for such undertaking. Consultants can play a diplomatic role in strengthening collaboration and building trust among stakeholders. It is also important that they possess strong communication and persuasive skills. This action research has shown that the use of presentation tools was effective to explain complex problems in simple terms.

Trainings in methods, tools, and standards relevant to project implementation were perceived to be important for the stakeholders at the middle-level management, even though they are not directly involved in the implementation. Davis et al. (1992) argue that in order to motivate users, it is important to raise their level of perception that the to-be system will be instrumental in creating valued outcomes to them. In our project, these trainings helped build stakeholders' familiarity with the future system, confidence, and trust that the future system would be interoperable with its counterparts and thus enable them to perform their tasks easier.

Perhaps the most important success factor for creating a viable interagency collaboration is stakeholders' mutual understanding on the necessity for collaboration. Recognizing the project importance is signaled by the symbolic presence of the political head of state. The momentum to make Thailand as a world-class logistics hub in Indochina helps dealt with the less-than-ideal conditions for interagency collaboration.

A broad overview of issues discussed above are drawn from our experience as project consultants. The consequence of our attempt is that further in-depth research is needed for each of the many issues alluded here. In particular, managing conflict through avoidance would merit further investigation.

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