Business Process Analysis
Guide
to Simplify Trade Procedures

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FOREWORD

Today's international supply chains face an increasingly competitive environment, with new product safety regulations, and intense border security concerns. The need for traders to comply with all procedural, regulatory, and documentary requirements rapidly, accurately and cheaply has become extremely important in order to remain competitive.

To improve the efficiency and effectiveness of processes and information flows throughout the supply chain, it is crucial that the existing "as-is" conditions are well understood, prior to implementing trade facilitation reforms. Adapted from the business process modeling techniques that have been originally applied in the automation of mechanistic business processes, this Business Process Analysis Guide to Simplify Trade Procedures (BPA Guide) aims to provide a simple methodology to document the "as-is" business processes in international trade transactions. The BPA Guide also shares valuable country experiences and lessons learned in this area. Insights about existing processes and procedures in trade would provide senior government officials with crucial information on where improvements are necessary.

It is our hope that this BPA Guide will serve government officials as an instrument that facilitates the identification of bottlenecks in trade processes and procedures, the prioritization of areas for improvement, and the design of strategies to eliminate these bottlenecks. Ultimately, business process analysis can bring about greater transparency, improved efficiency, and greater capacity to innovate, which are in turn the keys to remaining competitive in today's international markets.

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ACKNOWLEDGEMENTS

The Business Process Analysis Guide to Simplify Trade Procedures (BPA Guide) was developed as part of the joint technical assistance project by ESCAP and UNECE and under the auspices of the United Nations Network of Experts for Paperless Trade in Asia and the Pacific (UN NExT). The project aims to raise the capacity and accelerate the adoption of the above-mentioned trade facilitation measures, especially in countries where those measures are not yet commonly implemented.

PREFACE

Moving goods across borders requires meeting a vast number of commercial, transport and regulatory requirements. Inefficiencies in complying with these requirements often create unnecessary delays and costs. At present, a source of tremendous inefficiencies is associated with the preparation of transport and regulatory documents, unclear border procedures, and overzealous cargo inspection.

A Single Window (see Glossary) is one of the trade facilitation measures that has increasingly gained momentum, especially in the Asia-Pacific region, as it serves as the foundation for paperless trading. Once it is fully operational, the complexity as well as unnecessary delays and costs in administering cross-border movement of goods are expected to be significantly lessened.

To ensure that the Single Window facility responds to stakeholders' needs in different stages of the international supply chain, it is important that its design reflects the business processes in use. Given that the existing business processes may entail redundant activities and complexities that create procedural inefficiencies and bottlenecks, it is essential to harmonize and simplify the existing business processes prior to adopting them as a basis for the design of the Single Window. The harmonization and simplification of business processes cannot be achieved without good and in-depth understanding of existing practices.

The BPA Guide offers a simple methodology to elicit, document, and analyse the existing "as-is" business processes involved in international trade, as well as aid in developing recommendations for further improvement. It suggests a set of practical steps and activities, from setting the scope of the business process analysis project; planning its implementation; collecting relevant data; and presenting it in an easily understandable manner, to analysing the captured data in order to identify bottlenecks and developing recommendations for improvement. This recommended set of steps and activities was generalized from the business process analysis exercise conducted in Thailand in preparation for the development of Thailand's Single Window e-Logistics, which is a national obligation under the ASEAN Single Window initiative. To make the BPA Guide practical, a case study on business process analysis of the export of jasmine rice in Thailand is provided in the Annex.

The BPA Guide intends to serve practitioners and policymakers from government agencies or the private sector involved in:

- The harmonization and simplification of international trade procedures;
- The harmonization of related data requirements with the international standard; and
- The implementation of Single Window.

From the BPA Guide, practitioners will learn a step-by-step approach to business process analysis and development of recommendations for future improvement. Policymakers, on the other hand, will benefit from a better understanding of the linkage between business process analysis and trade facilitation measures, including business process simplification, data harmonization, and Single Window implementation. They will become acquainted with prerequisite steps that have to be taken prior to the implementation of trade facilitation measures.

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ABBREVIATION

ASEAN	Association of Southeast Asian Nations
ASYCUDA	Automated System for Customs Data
ECE	United Nations Economic Commission for Europe
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ICT	Information and Communication Technologies
PERT	Project Evaluation and Review Technique
UML	Unified Modeling Language
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UN NExT	United Nations Network of Experts for Paperless Trade in Asia and the Pacific

1. TRADE FACILITATION AND BUSINESS PROCESS ANALYSIS

International trade transaction encompasses all activities related to the establishment of commercial contracts (commercial procedures), the arrangement of inland and cross-border transportation of goods (transport procedures), the export and import formalities to meet regulatory requirements (regulatory procedures), and the payment for purchased goods (financial procedures). It requires cooperation between many actors, including traders, government agencies and service providers from different countries.

1A PARTICIPANTS AND THEIR INTERESTS

According to their interests and needs, the actors of the international trade transaction can be grouped into the following categories:

a) Government agencies

Government authorities such as ministries of trade, finance/customs, transport, health, agriculture, information and communication technology, veterinary, plant and quarantine agencies are responsible for devising trade facilitation strategies, reform programmes, and laws and regulations to ensure the smooth flow of goods and information in a secure environment. Customs authorities have a specialized role here, which traditionally was to control the entry and exit of goods and to collect revenues. Later, this role was extended to ensure border security and port administration. Recently, the focus has been shifted from enforcement to trade facilitation with the use of pre-arrival clearances, the authorized economic operator's concept, green lanes and post-clearance audits, increasingly employing electronic trade data submission, processing and exchange as well as information and communication technologies (ICT)-enabled trade facilitation solutions, such as Single Window systems. These government agencies need enhanced tax collection, more precise foreign trade statistics and better administration controls, which Single Window and paperless trade systems can provide.

Box 1.1. The UN/CEFACT international supply chain model

UN/CEFACT Recommendation No. 18 illustrates a simplified view of the international supply chain in the Buy-Ship-Pay model (see the picture below). The model not only suggests "a series of fragmented activities" that are carried out throughout the international trade transaction, but also defines different types of actors that are associated with them. Key actors in the international supply chain are authorities, intermediaries, suppliers, and customers.

Authority

Supplier → BUY → SHIP → PAY → Customer
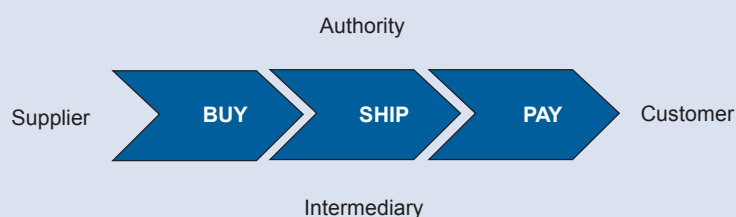
Intermediary

b) Intermediaries

Intermediaries are those who provide commercial, financial, and/or transport services within an international supply chain, such as freight forwarders, customs brokers, third-party logistics service providers, carriers, express integrators, port and terminal operators, banks, insurance companies, and information technology (IT) value-added service providers. They are normally from the private sector, which needs a swift exchange of trade information and transparent regulatory environment in order to comply with the requirements of clients.

c) Traders

Generally, they are the source and the target of the supply chain. They are principals of the cargo and users of the services provided by the intermediary. They not only depend on the services provided by services providers, but also must meet the regulatory requirements of government agencies for moving goods across borders. At the same time, they also participate in the implementation of trade facilitation regulations and measures in collaboration with government agencies. Trading companies and business communities need a transparent and predictable trading environment, and solutions that cater to faster customs clearance, reduced delays at the borders, lower trade transaction costs, reduced corruption, and cheaper and more competitive exports.

1B BUSINESS PROCESS ANALYSIS IN THE CONTEXT OF TRADE FACILITATION

To reduce the complexity of the international trade transaction and thus costs related to it, UN/CEFACT recommends implementation of the following measures:[1]

- The simplification and harmonization of trade procedures and, where possible, elimination of unnecessary ones;

- The simplification and coordination of administrative procedures at border crossings;

- The simplification of payment systems;

- The simplification, standardization and harmonization of documents required for a trade transaction;

- The facilitation of flow of information that controls the movement of goods throughout the transaction (e.g. by applying information and communication technology); and

- The enhancement of trust assessment through a better exchange of information.

The successful implementation of trade facilitation measures, however, requires not only political and governmental support in terms of policy directions as well as human and financial resources, but also an in-depth understanding about existing business processes.

According to UN/CEFACT's step-by-step approach toward a Single Window paperless environment as shown in Figure 1.1, business process analysis is recommended as the first step to be taken before undertaking other trade facilitation measures related to the simplification, harmonization, and automation of trade procedures and documents.[2]

In order to improve the efficiency and effectiveness of processes and information flows throughout the international supply chain, it is highly recommended that the "as-is" conditions of relevant business processes are well understood prior to the selection of trade facilitation measures.

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[1]   UNECE (2006b). *Towards an Integrated Strategy for UN/CEFACT,* Geneva.

[2]   UNECE (2006a). *Background Paper for UN/CEFACT Symposium on Single Window Common Standards and Interoperability,* Geneva.

Figure 1.1. Step-by-step approach to developing an electronic Single Window and paperless trade environment

e-Single Window & paperless trading

Cross-border data harmonization & exchange

National data harmonization

Documents simplification and alignment

Process simplification and harmonization

Business Process Analysis
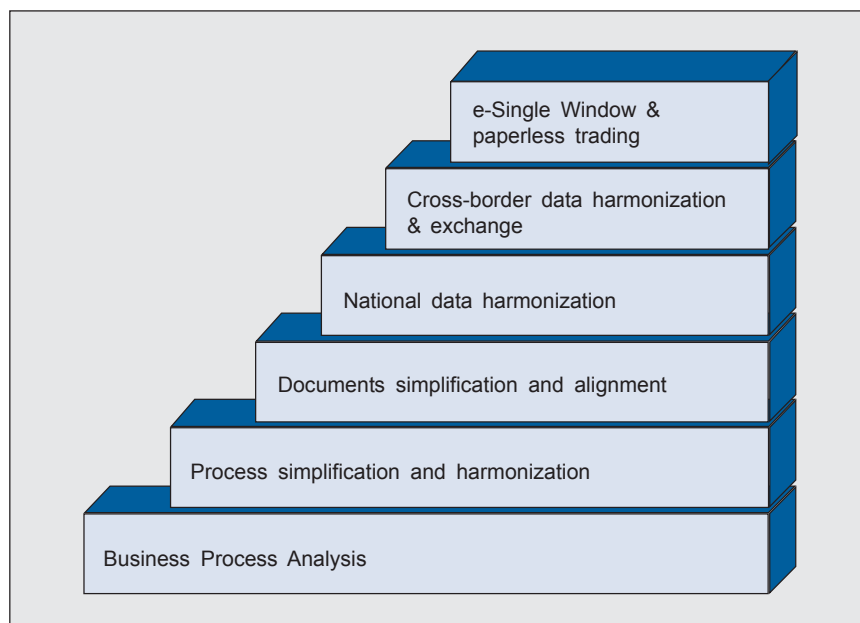
2. INTRODUCTION TO THE BUSINESS PROCESS ANALYSIS

2A DEFINITION AND SCOPE

A business process is a sequence of steps performed for a given purpose. Based on this generic definition, a business process considered within the framework of trade facilitation can be defined as:

A chain of logically connected activities to move goods and related information across borders from buyer to seller and to provide related services

Business processes are valuable organizational assets. They enable the creation and delivery of business values as defined by organizational goals. Business processes are often driven by information. In the area of international supply chain, for example, the movement of cargo has to be escorted by corresponding cargo documents. It involves an average of 40 documents, 200 data elements (30 of which are repeated at least 30 times) and the re-keying of 60 to 70 per cent of data at least once.[3] Delay on document processing or lack of integrity in the information that flows across business processes has become a factor that holds back cargo movement. On the average, each additional day that a cargo is delayed prior to being shipped reduces trade volume by at least 1 per cent and by approximately 7 per cent if the products are time-sensitive to time-insensitive agricultural goods.[4]

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[3] APEC (1996). *APEC means business: building prosperity for our community. Report to the Economic Leaders.* Asia Pacific Economic Cooperation Secretariat, Singapore.

[4] Djankov, S., Freund, C., and Pham, C. (2006). *Trading on Time,* World Bank, Washington DC.

Because the underlying business process has a significant impact on the performance of the overall business, any process improvement achieved can enhance the competitiveness both at the organizational and the national level. Business process analysis is a study of existing business processes within one or across several organizations, both in normal operation and in exceptional situations. Its primary goal is to understand attributes of business processes and relationships among them. The results of the business process analysis may serve as a baseline for implementing trade facilitation measures such as:

- Simplification of trade procedures (including commercial, transport, regulatory and financial procedures);

- Simplification of documentary requirements and their alignment with international standards; and

- Automation of international trade transaction and its associated electronic documents for Single Window and paperless trade systems.

2B BUSINESS PROCESS MODELING METHODOLOGY USED IN THIS GUIDE

Business process modeling is a technique for documenting business processes where each element of the business process is represented by graphical notations. It can be achieved by a simple drawing with paper and pencil or a software tool. The resulting graphical representation of a business process is known as a *business process model.* Each business process model illustrates:

- Activities that come in a specific order and decision points;

- Actors who perform those activities;

- Defined inputs and outputs of each activity;

- Criteria for entering and exiting the business process;

- How actors relate to one another;

- How information flows throughout the business process;

- Associated rules and regulations; and

- Quantitative indicators such as number of steps, as well as time and cost required to complete a particular business process.

The documentation of existing business processes in simple diagrams and brief descriptions helps create a common understanding on working norms and operational procedures among relevant stakeholders. The stakeholders of the business processes include practitioners who deal with the documented business processes on a daily basis; experts who may be brought in to assist with the initiation and implementation of business process improvement programmes, and decision makers who make informed decisions regarding the revision of related regulations and procedures.

Business process models are increasingly used in trade facilitation. For the purposes of this Guide, the business process model serves as a tool that facilitates:

- The analysis of activities, documents, and information flow in international trade procedures;

- The identification and prioritization of problematic areas that cause the delays in moving goods from seller to buyer; and

- The design of improvement measures to address these problematic areas (e.g. simplifying processes and data, and eliminating redundancies).

The Unified Modeling Language (UML)[5] provides a set of standard graphical notations for business process modeling. UML is internationally accepted and widely used not only among practitioners in business communities but also in information technology and software development. The consistency in modeling techniques produces results in a form that is easily understood, analysed and validated. If the ultimate goal of the business process modeling and analysis is to automate the international trade transaction and move to electronic trade documents exchangeable through the Single Window and paperless trade systems, the use of common standard graphical notations in business process modeling is vital. This is mainly because the common standard graphical notations allow business domain experts to communicate procedural and documentary requirements with technical experts who are designated to put the systems in place.

2C UML GRAPHICAL NOTATIONS USED IN THIS GUIDE
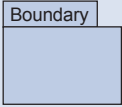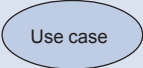
In business process analysis, the use case diagram serves as a project's frame of reference. Its purpose is to present a graphical overview of core business processes that are subject to further examination at a greater depth. It indicates all stakeholders involved in these business processes and demonstrates all actual associations between these business processes and the stakeholders.

The activity diagram is an elaboration of each business process displayed in the use case diagram. It portrays a sequence of activities and information flows from one responsible party to another. It informs its audience not only who is doing what in which order, but also documentary inputs that serve as prerequisites to activities and documentary outputs that can be obtained upon completion of activities. A set of graphical notations for use case and activity diagramming are provided with explanations of their meaning in Tables 2.1. and 2.2. These notations are adopted from UML.
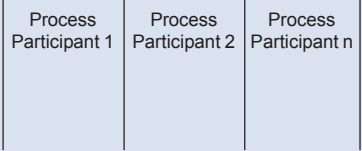
This BPA Guide focuses on modeling business processes with two types of UML diagrams: the use case diagram and the activity diagram, shown in Figure 2.1. The use case diagram illustrates the high-level business processes and actors associated with each of them. It serves as a frame of reference for further elaboration of business process modeling work. The activity diagram, on the other hand,

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5   UML Resource Page, http://www.uml.org.

Table 2.1. Use Case Diagram notations

Notation	Description and instruction for use
Boundary	**Subject Boundary:** – Represents a process area – Includes the name of a subject boundary on top
Actor/Role	**Actor:** – Represents a role which participates in a particular business process. – Can be an individual, an organization, a department, etc. – Is labelled with a role-name – Is placed outside the subject boundary
Use case	**Use Case:** – Represents a core business process – Is labelled with a descriptive verb-noun phrase
————	**Relationship Association:** – Links actors with the use cases (business processes) they participate in

Table 2.2. Activity Diagram notations

Notation	Description and instruction for use
●	**Initial State** – Represents the beginning of a set of activities – Can only be one initial state for each activity diagram
⊗	**Final Flow State** – Is used to stop the flow of activities – Indicates that further activities cannot be pursued within the described context
◉	**Final Activity State** – Is used to indicate the completion of the business process
Process Participant 1 | Process Participant 2 | Process Participant n	**Swimlane** – Is used to break up individual actions to individuals/agencies that are responsible for executing their actions – Is labelled with the name of the responsible individual, organization, or department
(activity)	**Activity** – Represents a non-decomposable piece of behaviour – Is labelled with a name that 1) begins with a verb and ends with a noun; and 2) is short yet contains enough information for readers to comprehend *(Continued)*

Table 2.2. *(continued)*

Notation	Description and instruction for use
	Object – Represents a document or information that flows from one activity to another activity – Is labelled with a name of a document
	Decision – Represents the point where a decision, depending on the outcome of a specific prior activity, has to be made – Has multiple transition lines coming out of a decision point and connecting to different activities – Attached with labels addressing the condition on each transition line that comes out of an activity and connects to a decision point or vice versa
	Transition line – Indicates a sequential flow of activities and information flows in an activity diagram
	Fork (Splitting of Control) – Is used to visualize a set of parallel activities or concurrent flow of activities
	Join (Synchronization of Control) – Is used to indicate the termination of a set of parallel activities or concurrent flow of activities

describes activities, inputs, and outputs associated with each business process listed in the use case diagram.

2D OUTPUTS OF THE BUSINESS PROCESS ANALYSIS

The main output of the business process analysis exercise within the context of trade facilitation is the business process analysis report that contains the following components:

- Use case diagram showing the scope of the business process analysis project;

- Activity diagrams;

- Process descriptions, including a list of trade forms and documents, as well as a list of trade-related laws, rules and regulations;

- Integrated activity diagram;

- Time-procedure chart;

- A list of identified bottlenecks; and

- Recommendations to improve the business process and/or to-be business process models.

These output components are further explained in the following parts of the BPA Guide.

Figure 2.1. The use of UML diagrams in the BPA Guide

UML Use Case Diagram	UML Activity Diagram

UML Use Case Diagram and Activity Diagram are used to visualize the captured knowledge of the business processes.
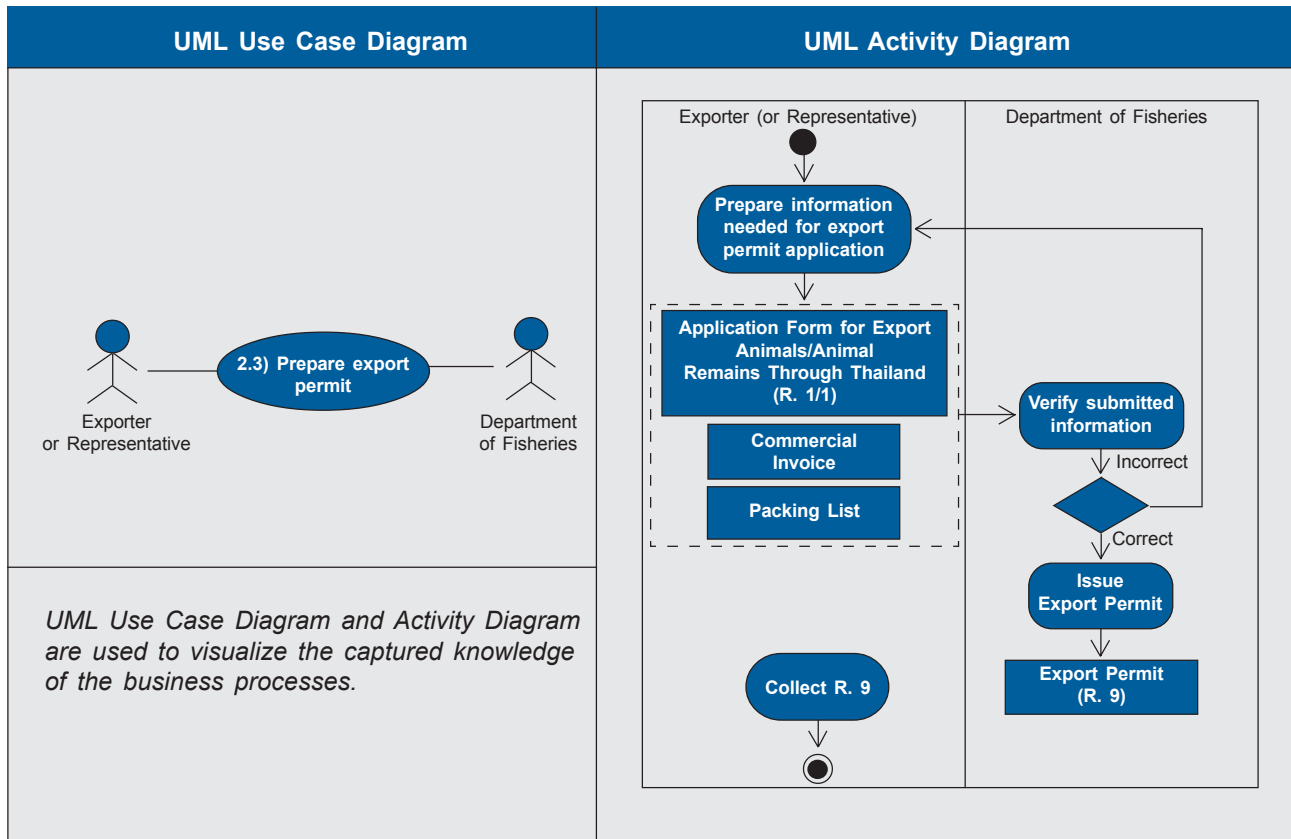
3. BUSINESS PROCESS ANALYSIS GUIDE TO SIMPLIFY TRADE PROCEDURES

3A INTRODUCTION TO PHASES, STAKEHOLDERS AND OTHER RELATED ISSUES

The business process analysis consists of three phases that have to be carried out in sequence (see Figure 3.1):

Phase I: Scope setting, which includes the following two steps:

Step 1 - Define a project scope

Step 2 - Develop a detailed work plan and secure resources

Phase II: Data collection and process documentation, which includes two steps:

Step 3 - Acquire background information

Step 4 - Conduct interviews and document captured data

Figure 3.1. Key steps and stakeholders in business process analysis
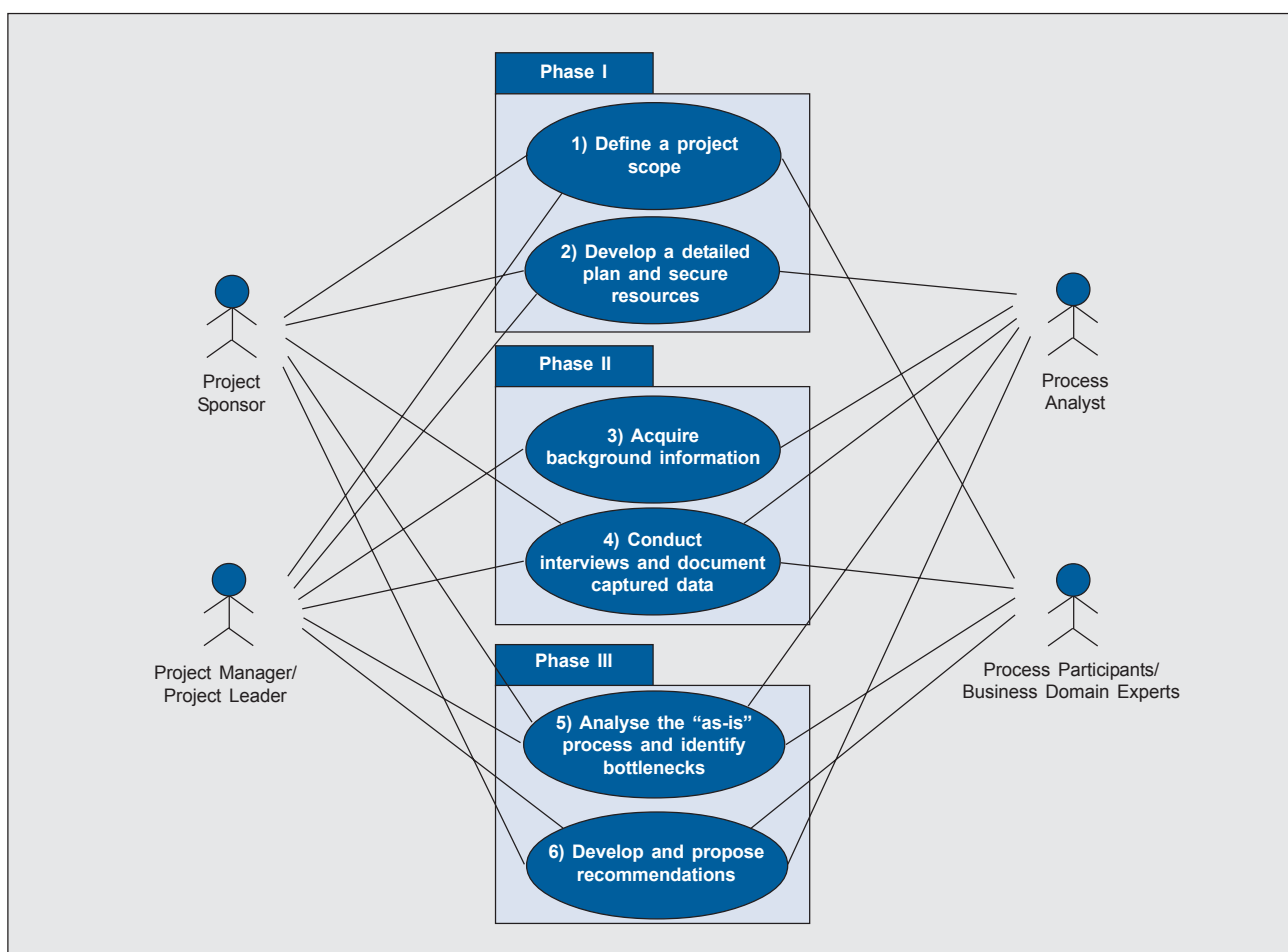
Phase III: Process analysis and recommendations development, which includes the following two steps:
Step 5 - Analyse the "as-is" processes and identify bottlenecks
Step 6 - Develop and propose recommendations.

Four groups of stakeholders participate in a business process:

- Project Sponsor, who acts as authorized person from a lead agency commissioning the business process analysis study;

- Project Manager/ Project Leader, who is in charge of planning, directing, staffing, and managing the development of the business process study;

- Project Analysts, who are in charge of collecting, documenting and analysing the business processes;

- Process Participants/ Business Domain Experts, who carry out business processes and thus have specific expertise and knowledge of a business process.

Their responsibilities in the different phases of the business process analysis are summarized in Table 3.1.

Table 3.1. Roles and responsibilities of stakeholders in BPA

Role	Phase I		Phase II		Phase III	
	Step 1: *Define project scope*	Step 2: *Develop a detailed plan and secure resources*	Step 3: *Acquire background information*	Step 4: *Conduct interview and document captured data*	Step 5: *Analyse the "as-is" processes and identify bottlenecks*	Step 6: *Develop and propose recommendations*
Project Sponsor	Finalize and approve the project scope	Approve any changes to project scope Commit specific resources	Provide management support and direction when needed Participate in major project reviews and approve key deliverables Ensure timely resolution of issues affecting project success			
Project Manager/ Project Leader	Acquire relevant information to define the scope of a process under investigation	Develop a detailed plan Organize resources	Oversee and control the execution of the plan Participate in the review of milestone deliverables including the final output			
Process Analysts	–	Review plan and propose adjustment if needed	Conduct desk research Make necessary preparation for interview and observation	Conduct the interviews Collect and consolidate data Document the "as-is" processes	Analyse and identify bottlenecks and improvement opportunities of the "as-is" processes	Develop recommendations for process simplification Report the final output
Process Participants/ Business Domain Experts	Verify the proposed project scope	–	Provide relevant knowledge on process under investigation Verify the accuracy of applicable deliverables			Participate in the review of the final output

Table 3.2. Overview of BPA

Step	Deliverables	Do's	Don'ts
Step 1: Define project scope	*Use case diagram and description* illustrating: – Business domain – Process areas – Process participants – Business processes in which those participants interact	Be precise on the scope of the process analysis study. Specify the environment and conditions in which the business domain of interest operates, such as mode of transport, terms of delivery, terms of payment, country of destination, and country of origin at the early phase of the business process analysis project, because different modes of transport, terms of delivery, and terms of payment have different procedural and documentary requirements. Set the scope from the perspective of the beneficiary. For example, with limited resources, detailed modeling and analysis of the business process for the export of one product is not possible. In this case, the emphasis should be oriented towards project beneficiary. If the beneficiary is an exporter, the emphasis is on what the exporter has to do in order to ship the cargo to the destination country. If the beneficiary is a carrier, the emphasis is on what the carrier has to do in order to leave the port of departure. Break the project into sub-projects if the scope is relatively large. For example, if the project requires the analysis of business processes for exporting 10 countries' strategic products, break the project into 10 sub-projects and define the project scope for each of them.	Do not set the scope that is too broad or vague.
Step 2: Develop a detailed plan and secure resources	*Detailed project plan* including human resources, schedules, and software supported tools *A list of potential interviewees and their contact information*	Set up a team that consists of process analysts with critical thinking.	Do not underestimate the efforts and time needed for certain tasks, especially those related to human interactions, e.g. data collection and verification.
Step 3: Acquire background information	*A folder of background information* on the business processes which may be accompanied by a brief explanatory note of the business step. *A list of guiding questions for the interview*	Do collect as much background information as possible from diverse available sources.	Do not conduct any interview session before the interviewer has sufficient background information and becomes familiar with the organization and the specific business processes under interview.
Step 4: Conduct interviews and document captured data	*A set of activity diagrams* illustrating: – Starting and ending points – Pre-conditions and post-conditions of each business process – A set of activities – Documents associated with each business transaction – Output and criteria to exit the business process	Inform interviewees about overall expectations from the interview session and the specific business processes of interest. Define and document processes in a way that reflects the current state of practices. When describing and documenting a process, start with the activity diagram. Drawing helps formulate ideas and a logical sequence of activities. Most likely, drawing the first diagram is going to be a struggle. If two connecting	Do not attempt to create processes that look "perfect" from the beginning. Perfection does not represent what actually happens in reality and thus cannot serve as a baseline for improvement. *(Continued on next page)*

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Table 3.2. *(continued)*

Step	Deliverables	Do's	Don'ts
	– The average time required to complete that process step *A set of business process descriptions* describing: – The name of a process area to which this particular business process belongs – The name of the business process – Related rules and regulations – The name of the responsible parties – Input and criteria to enter/begin the business process – Activities and associated documentary requirements to complete this step (including forms, and document templates and examples) – Output and criteria to exit the business process *Activity diagram* illustrating integrated processes in the business domain *Time-Procedure Chart*, a chart illustrating relationships between business process and time required to complete each business process in the business domain of interest	activities in a logical sequence do not make sense, it means some activities may be missing in between. Write down questions that come up when drawing the diagram and use them for another interview session. Structure the second round of the interview based on these questions. Hold an experience-sharing session among the team of process analysts from time to time. Experience sharing allows process analysts to observe and depict patterns in some processes across the business domain. For example, process analysts responsible for defining processes of different products will discover among themselves that no matter what products there are, traders have to comply with customs regulations in submitting customs declarations following similar instructions. Always reuse patterns (diagram of identical activities) where applicable, as it saves time and ensures the consistency of processes across the business domain.	
Step 5: Analyse the "as-is" processes and identify bottlenecks	*A set of observations* of the "as-is" processes that have the potential to be improved	During the interview, seek interviewees' opinions and observations on bottlenecks and issues related to the procedural, regulatory, and documentary requirements that should be improved and how to improve them.	Do not wait to the end to analyse and identify any bottlenecks and recommendations for improvement. Rather, incrementally collect them along various phases of the process analysis study.
Step 6: Develop and propose recommendations	*Final report with recommendations* for process simplification, which may include diagrams of "to-be" business processes	Consult relevant stakeholders to find out the limitation of what can and cannot be done for process improvement recommendations. Listen to their reasons why a particular procedural, regulatory, or documentary requirement is necessary.	Do not assume that all proposed recommendations can be implemented.

The steps within each phase require that a series of activities be carried out. These activities will be explained in Section 3B. It is highly recommended that validation and verification activities are embedded in each step to ensure the accuracy and comprehensiveness of the outputs. Such validation and verification can be achieved through several rounds of a peer review performed by relevant stakeholders of the business process analysis exercise. Refinement shall be made until the quality of outputs is acceptable.

The six steps described in this guide, together with deliverables of the business process analysis report, are summarized in Table 3.2. The same table also provides guidance on what should be done (the "Do's") and what should be avoided (the "Don'ts") in conducting the business process analysis exercise.

3B INDIVIDUAL PHASES, STEPS AND ACTIVITIES

The rest of this Chapter will discuss the three phases of the business process analysis, detailed steps involved in each phase and activities necessary to complete the steps.

Phase I: Scope setting

The objective of this phase is to establish a baseline for the implementation and management of a business process analysis project. It consists of two steps:

Step 1 - Define the project scope

Step 2 - Develop a detailed work plan and ensure resources.

Step 1: Define the project scope

Step 1 aims at identifying a frame of reference for further detailed business process modeling work. Using the UML use case diagram, this view illustrates the high-level business processes and actors associated with each of them.

This step includes seven necessary activities, as illustrated with the UML activity diagram in Figure 3.3. Its detailed description is provided below.

Activity 1.1

Project sponsor identifies "a business domain" of interest. A business domain is usually the name of the industry (such as frozen shrimp export) or service (such as customs clearance) whose business processes are subject to the business process analysis exercise. (See Box 3.1 for an example)

To initiate a Business Process Analysis it is crucial that the project sponsor clearly specifies:

- The stage of the international supply chain that he/she is interested in analysing - i.e. "Buy", "Ship", or "Pay"; and

- The environment and conditions in which the industry of interest operates and which shall be included in the BPA; i.e. mode of transport, terms of delivery, terms of payment, and country of destination (given that regulatory requirements vary from one country to another).

Figure 3.2. Stakeholders involved in Step 1

This UML use case diagram indicates that Step 1 "Define project scope" requires the participation from:
– Project Sponsor
– Project Manager/Project Leader
– Process Participants/Business Domain Experts

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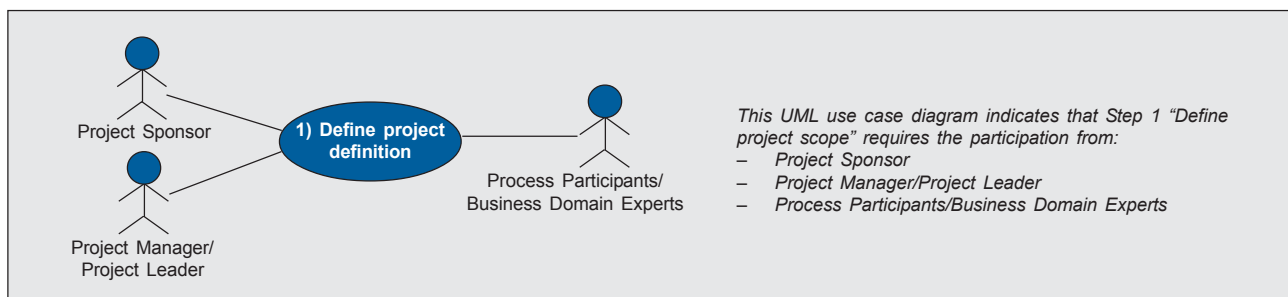
Figure 3.3. Activities involved in Step 1
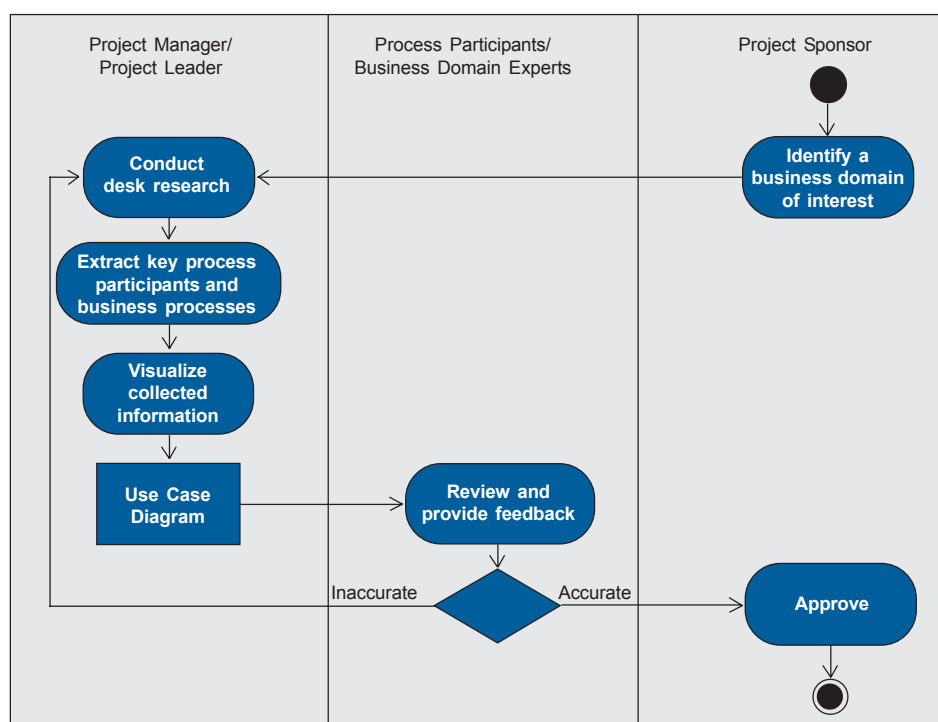
Box 3.1 Case study – define the project scope

Recognizing the need for a greater efficiency in documentary procedures related to international trade transactions, Thailand has prioritized the establishment of the Single-Window e-Logistic Platform as the national flagship project. Progress towards the establishment of the Single-Window e-Logistic Platform was hindered by several factors, one of which was the absence of knowledge about the integrative nature of processes performed by different parties and about information flow throughout the international supply chain.

In response to this shortfall, the Department of Export Promotion (under the Ministry of Commerce) commissioned an in-depth study on the export process with the following objectives:

- To drive formalization of the export process;
- To investigate interrelationships among processes, information, and stakeholders, as well as related laws and regulations;
- To provide a basis for simplification of procedural requirements and harmonization of data requirements; and
- To facilitate automation of international trade transactions, and thus the establishment of the Single-Window e-Logistic Platform.

Export processes vary by product. It is therefore not possible to carry out the study of the export process for all products at once. Given the resource constraints, it was decided to include only one product in the project. Products were prioritized and rated using the following criteria:

- Strategic importance of the product on national economy;
- Aggressiveness of competition; and
- Degree of willingness of stakeholders to participate in data collection process.

Frozen shrimp was the product selected, based on the above criteria. It is one of the country's strategic export products. The export volume of shrimp has been growing for the past five years. The production of frozen shrimp, in addition, involves the whole chain of production from farmers to manufacturers, retailers, and suppliers. About 80 percent of raw materials for production are sourced locally. Thai producers have been targeted to differentiate their products to deal with direct competition with low-cost Chinese and Vietnamese shrimp. Rice and poultry are also considered as among Thailand's strategic export products. However, relatively close connection with stakeholders from shrimp exporters, their logistics service providers, and relevant government agencies gave relatively more confidence in achieving the goal of the project.

Source: ESCAP from The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University

Activity 1.2

Project manager/project leader conducts initial desk research to identify core business processes that are related to the business domain of interest.

Activity 1.3

Project manager/project leader, based on research outcome, extracts key business processes associated with the industry or service of interest, as well as stakeholders who interact with those business processes.

Activity 1.4

Project manager/project leader documents captured core business processes and stakeholders of the business domain of interest using UML Use Case notations (see table 2.1).

Project manager/project leader uses the following notations:
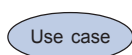
- to depict core business processes;

- to depict each stakeholder, who is known as process participant/ business domain expert; and

- to depict all actual associations between business processes and process participants/business domain experts.

When there are core sub-business processes, project manager/project leader may organize core business processes into a process area. Boundaries may be used to group core sub-business processes together.

An example of a UML use case diagram is given in Box 3.3.

Activity 1.5

Process participants/business domain experts review the use case diagram and provide feedback in terms of its accuracy as well as suggestions for further improvement.

Box 3.2. Case study – scope of analysis

The Ministry of Commerce, represented by Department of Export Promotion, as a project sponsor, specified that the analysis of the frozen shrimp export process covers all activities in the international trade transaction, which range from "the establishment of commercial contracts", through "the arrangement of inland and cross-border transportation and export formalities to meet regulatory requirements" to "the payment of the purchased cargo". Due to the fact that mode of transport, terms of delivery, and terms of payment can vary, the project sponsor agreed to the following assumptions made for the study:

- Ship: Shrimp exporters choose ocean freight as a mode of transport, as it is one of the cheapest and most convenient ways to ship goods overseas.
- CIF (Cost, Insurance, and Freight): Shrimp exporters in most cases arrange and absorb the cost of shipping their cargo to the port of destination. Minimum insurance coverage is also procured against loss of or damage to the goods during the carriage.
- FCL (Full Container Load): For simplicity, the analysis of frozen shrimp export process traces the operation of a sole exporter. It is also assumed that the whole container is intended for a single consignee.
- CY (Container Yard) Container Service: For simplicity, it is assumed that CY/CY container service is used. Under such service, the carrier delivers an empty container to exporter's premises for loading and brings the loaded container back to the container yard. At the container yard, the container waits to be loaded onto the vessel. No unpacking or modification is made.
- L/C (Letter of Credit): For simplicity, a letter of credit is assumed as method of payment.

Source: ESCAP from The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University

Activity 1.6

Project manager/project leader revises and/or refines the project scope where necessary, based on the feedback from process participants/business domain experts.

Activity 1.7

Project sponsor approves the final version of use case diagram. The use case diagram acts as a baseline for planning, managing, and carrying out the business analysis study.

Box 3.3. Case study – visualize the project scope

This UML use case diagram illustrates core business processes used when exporting frozen shrimp from Thailand. It provides the frame of reference for analysing the business processes in detail. The diagram lists all process participants/business domain experts, business processes, and the relationships among them.

The diagram shows that the scope of analysis will cover all activities in the international trade transaction, which include commercial procedures, transport procedures, regulatory procedures, and financial procedures. The core business processes are organized according to the UN/CEFACT "Buy-Ship-Pay" model. Given that the movement of cargo has to comply with regulatory requirements, transport procedures and regulatory procedures are closely related. Their main sub-processes are therefore grouped as "Ship".
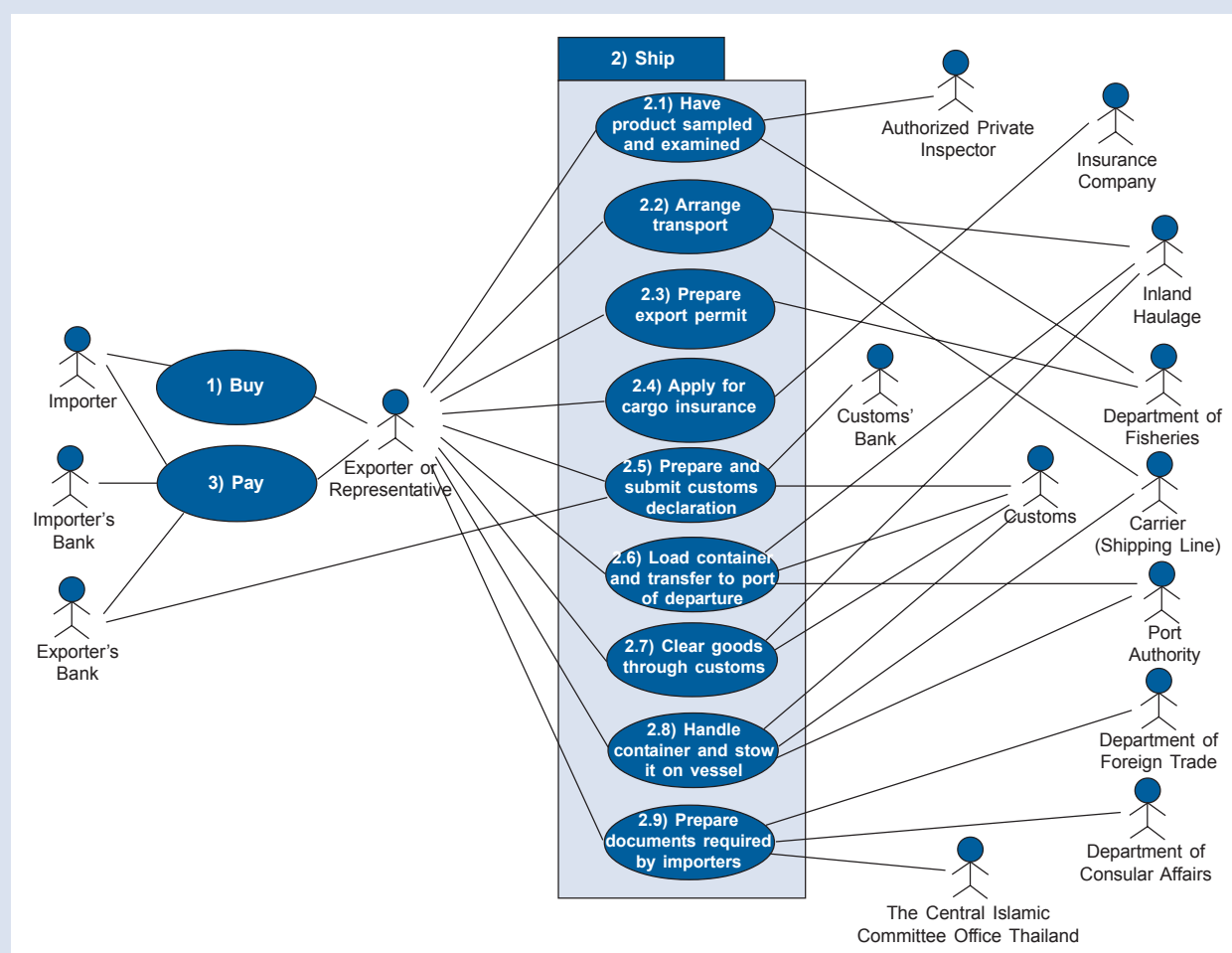
Source: ESCAP from The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University

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Figure 3.4. Stakeholders involved in Step 2

Figure 3.5. Activities involved in Step 2

The use case diagram may be changed at a later stage if an inaccuracy is found. The revised diagram should be approved by the project sponsor before adopting it as a frame of reference.

Step 2: Develop a work plan and secure resources

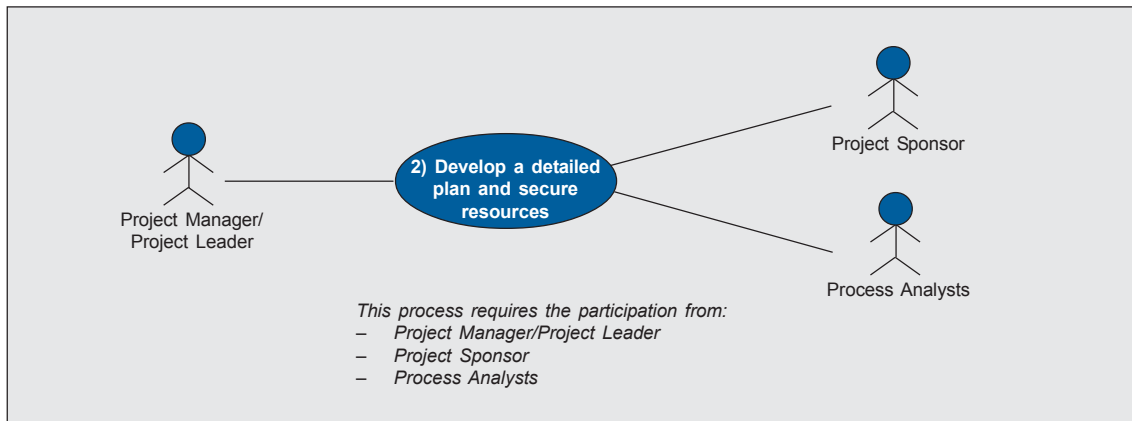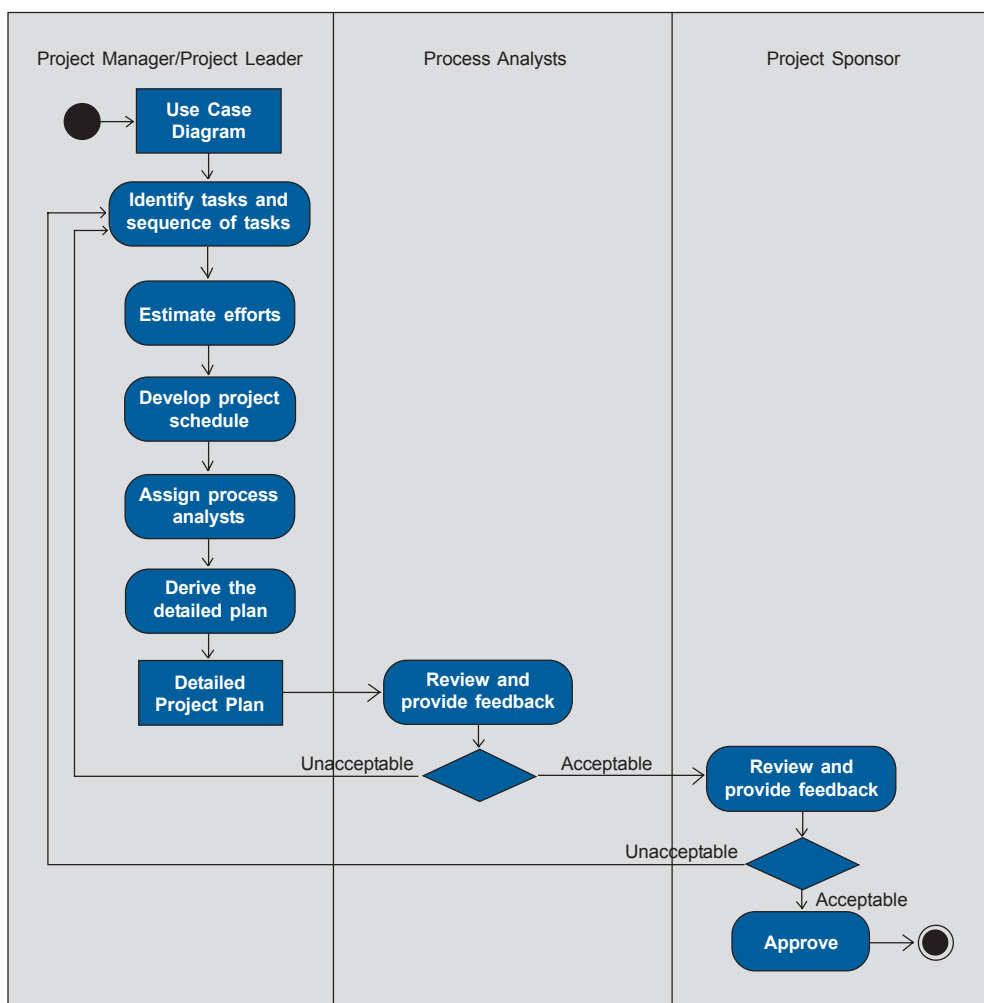The objective of this step is to develop a detailed work plan that guides and manages the implementation of the business process analysis. The work plan should be based on the use case diagram developed in Step 1.

Based on the use case diagram, the work breakdown structure, which is an output-oriented description of project tasks, can be developed. This work breakdown structure then provides a starting point for estimating project costs, staffing and scheduling.

Figure 3.5 illustrates activities that a project manager/project leader has to carry out in this step in cooperation with process analysts and under the oversight of the project sponsor. These activities are further explained below.

Activity 2.1

Project manager/project leader identifies, in sequential order, tasks required to derive each output of the business process analysis project. They include:

- Activity diagrams;
- Process descriptions, including a list of trade forms and documents as well as a list of trade-related laws, rules and regulations;
- Integrated activity diagram;
- Time-procedure chart;
- A list of identified bottlenecks; and
- Recommendations to improve the business process and/or to-be business process models.

To prepare the work breakdown structure of the project, the project manager/project leader needs to anticipate project activities outlined in Step 3 onward. While *Activity 3.1 – 3.3 and Activity 4.1 – 4.10* have to be carried out for all

core business processes represented by use cases in the use case diagram (see Box 3.4 for an example), the rest – including the development of integrated activity diagram, time-procedure chart, a list of identified bottlenecks, and recommendations for future improvement – requires only a one-time implementation.

Activity 2.2

Project manager/project leader estimates the effort (man-hours or man-days) needed to complete each identified task and to prepare all deliverables. There is no standard benchmark time for each activity required to complete the business process analysis project. Likewise there is no one-size-fits-all solution to determine the amount of required resources. However, the following approach may be helpful for time and resource estimation:

- In conducting business process analysis, great time and effort is spent on collecting and compiling data into visual diagrams and written descriptions. There is a set of similar project tasks for elaborating each use case into an activity diagram and process description. The more process participants/business domain experts are involved in a business process that is represented by a use case, the more complex and time-consuming the business process analysis will be.

- The first session of a face-to-face data-collection interview with each process participant/business domain expert who is a part of Phase II may take one to two hours. Given that the business process analysis is an iterative task, the interview with relevant process participants/business domain experts may be conducted more than once. However, the project teams should avoid conducting more than three interviews with the same process participants/business domain experts.

- Project Evaluation and Review Technique (PERT) estimate[6] might be used for this purpose. (See Box 3.5)

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[6] Marchewka, J.T. (2006). *Information Technology Project Management,* 2nd ed. John Wiley & Sons Inc., Hoboken, NJ.

Box 3.4. Case study – use cases of core business processes in frozen shrimp export
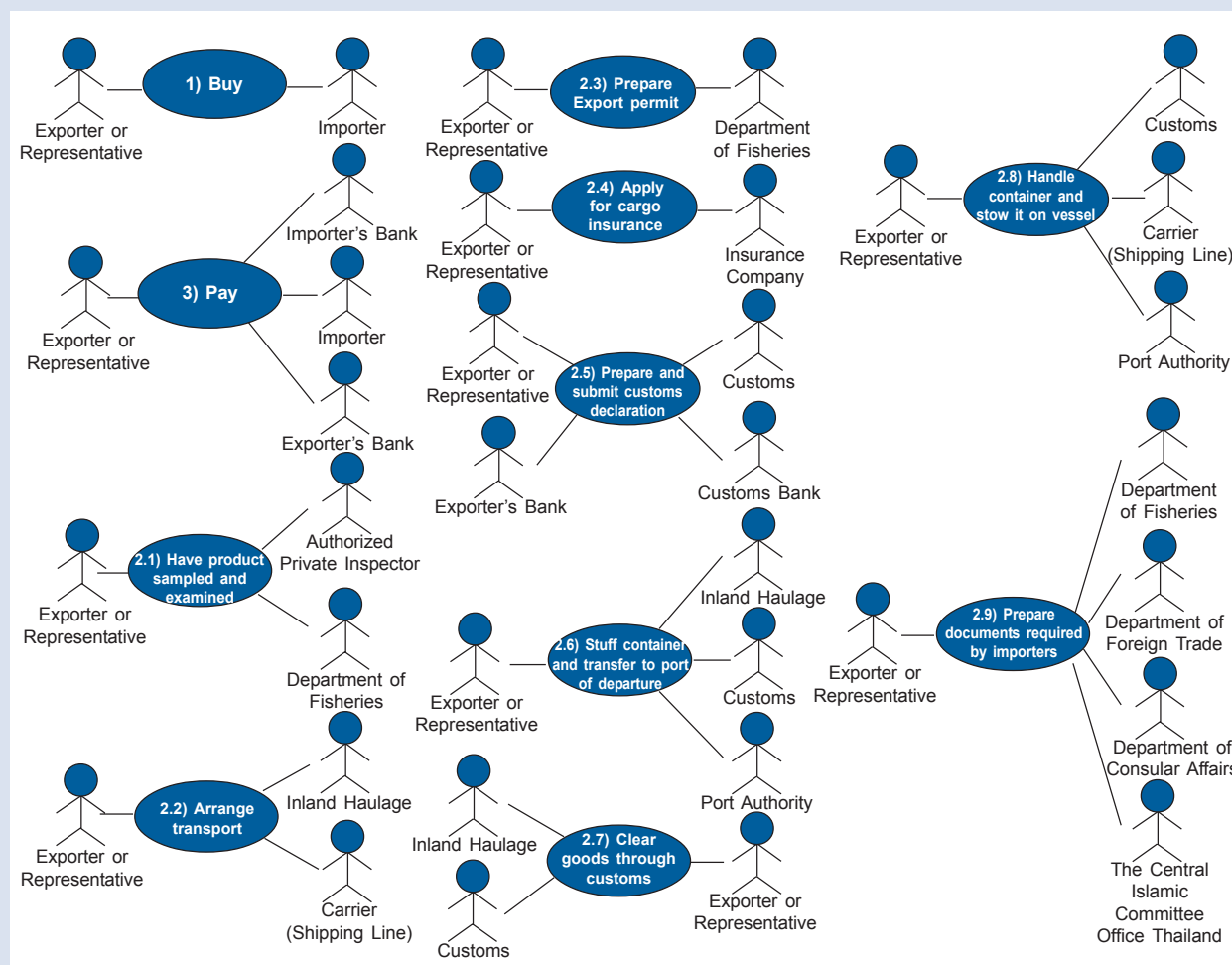
Source: ESCAP from *The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University*

Box 3.5. Project Evaluation and Review Technique (PERT) estimate

Project Evaluation and Review Technique (PERT) allows probabilistic treatment of activity duration in the estimation. PERT estimate may be used to compute weighted average for each individual task. A three-point estimate includes pessimistic, most likely and optimistic. The equation is as follows:

$$\text{Task Estimate} = \frac{\text{Optimistic Time} + (4 * \text{Most Likely Time}) + \text{Pessimistic Time}}{6}$$

- The Optimistic Time is the minimum time in which a task can be completed. It is the best-case scenario set under the assumption that everything goes as planned and no internal or external obstacles will occur.
- The Most Likely Time is an estimate of the expected time that is required to complete the task.
- The Pessimistic Time is the maximum time of the worst-case scenario in which the task should be completed.

Activity 2.3

Project manager/project leader develops a project schedule based on the following information:

- Set of tasks which are identified in a sequential manner

- Project effort estimates

- Duration of the project stated in the contractual arrangement made with the project sponsor.

Activity 2.4

Project manager/project leader assigns process analysts to the project. Once again the number of process analysts required depends on the project duration. The shorter the project duration is, the larger the number of process analysts is required. The responsibilities and required skills of process analysts are listed in Box 3.6.

Activity 2.5

Project manager/project leader compiles project time and effort estimates, project schedules, and project staff (process analysts)

into the detailed plan for project stakeholders to review.

Activity 2.6

Project stakeholders review the detailed plan and then provide feedback.

Activity 2.7

Project manager/project leader revises and refines the detailed plan, based on the received feedback.

Activity 2.8

Project sponsor, in consultation with other project stakeholders, approves the detailed plan as the baseline for future project execution, monitoring and evaluation.

Phase II: Data collection and process documentation

The knowledge about existing business processes is normally embedded in government or private sector employees who routinely conduct the business processes. Such knowledge is usually not documented, thus impossible to analyse and improve further. The purpose of

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Box 3.6. Responsibilities and required skills of process analysts

Process analysts are responsible for the following:

- Studying and analysing the current processes ("as-is" processes);
- Creation of the business process model;
- Developing recommendations how to improve the current processes; and
- Designing the new processes ("to-be" processes) in collaboration with other stakeholders.

Process analysts should be selected based on the following skills.

- *Technology skills:* Although it is not necessary, basic knowledge of UML notations, especially in use case diagrams and activity diagrams is desirable. Related work experience is complementary.
- *Business/organization skills:* It is important that the selected process analysts know or have an access to the individuals of the business domain subject to the business process analysis study. It is also very useful if they have knowledge of a particular organization or industry associated with the targeted business domain.
- *Interpersonal/communication skills:* The ability of the selected process analysts to effectively communicate and interact with other project members is crucial to project success. They should have the ability to create and sustain reasonably good relationships with project stakeholders and especially Process Participants/Business Domain Experts.
- *Analytical skills:* Ability to think analytically. They should be able to capture relevant information from verbal expression and written documents. They should be able to summarize the information, as well as formulate and document the business processes.

Phase II is to make the knowledge of these business processes readily available through documenting them. The documentation then can serve as a baseline to improve the processes.

Phase II includes two steps:

Step 3 - Acquire background information

Step 4 - Conduct interviews and document captured data

Step 3: Acquire background information

It is important that process analysts acquire at the outset as much background information on the business processes under examination as possible, prior to the face-to-face interviews. Background information could be obtained via desk research through information publicly available on the Internet, information portals, and at inquiry points of the agencies or businesses involved in the business domain of interest.

The background information is useful for process analysts in the preparation of interview questions and makes them better prepared to conduct face-to-face interviews. Moreover, it allows them to effectively and efficiently capture the information and data to be collected during the face-to-face interviews and put these into a broader context. Stakeholders participating in this step are shown in Figure 3.6.

Activities associated with gathering the background information are described in Figure 3.7, and further explained below.

Activity 3.1

For each use case (see Box 3.4 for example), process analysts conduct desk research, which involves the gathering of the background information, related laws and regulations from publicly accessible sources such as websites or inquiry points of relevant governmental agencies and business.

Activity 3.2

For each use case, process analysts systematically record and organize relevant information into a folder. The folder should contain the following information:

- Names of government and other agencies and businesses responsible for carrying out respective activities in the business processes under examination (e.g. chambers of commerce, in case of issuance of a non-preferential certificate of origin);

- Contact names and details of potential interviewees in the identified agencies and businesses, i.e. officer-in-charge at the operational level for each activity;

- Sequence of actions/activities in a process; i.e. processes and procedures required to move goods across the border;

- Forms and documents associated with each action/activity (import/export permits, SPS certificates[7], certificates of origin, commercial invoice, customs declaration, etc.).

Activity 3.3 The project manager/project leader reviews the outcome of desk research, including the interview questions, and determines whether process analysts are ready to proceed with the next step.

Step 4: Conduct interviews and document captured data

The purpose of Step 4 is to conduct the face-to-face interviews with process participants/ business domain experts. Face-to-face interviews are the most commonly used data collection method for the business process analysis exercise. This process aims to confirm the accuracy of the previously collected background information in order to gain an in-depth understanding of each use case or core business process in question. Such comprehensive information is necessary for creating a visual representation as well as descriptive explanation for each use case.

Once the face-to-face interview sessions with the relevant business process participants have been conducted, process analysts consolidate all inputs from interviewees and document them. There are three main outputs that should be delivered under Step 4:

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[7]   Sanitary and Phytosantary certificate

Figure 3.6. Stakeholders involved in Step 3
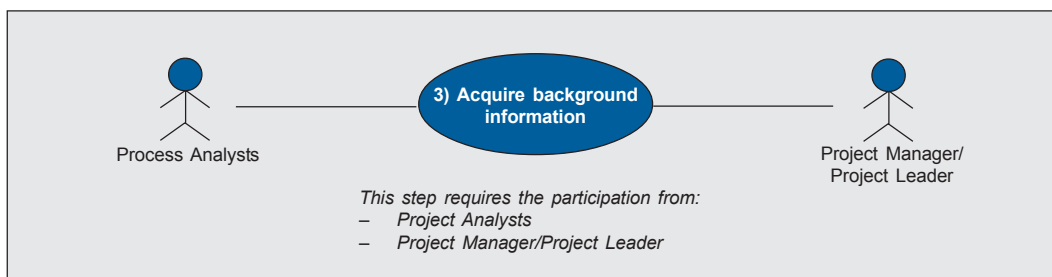
Figure 3.7. Activities involved in Step 3
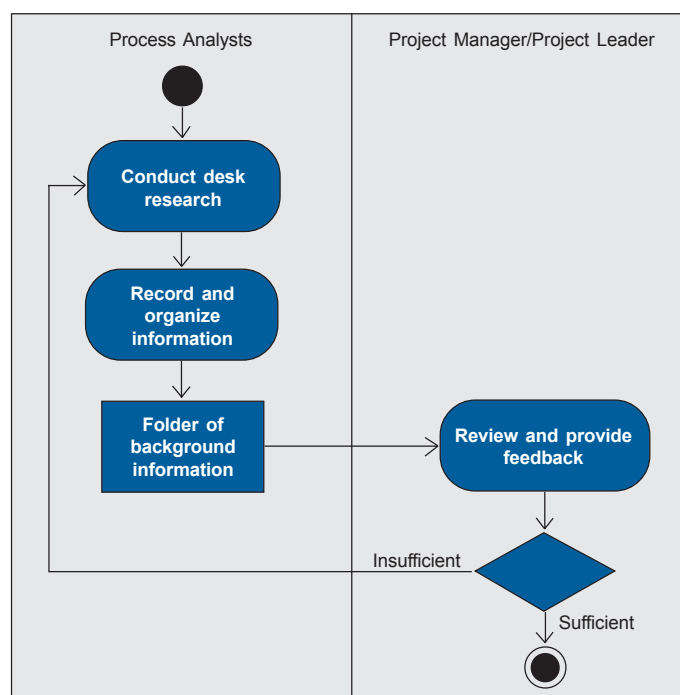
Figure 3.8. Stakeholders involved in Step 4
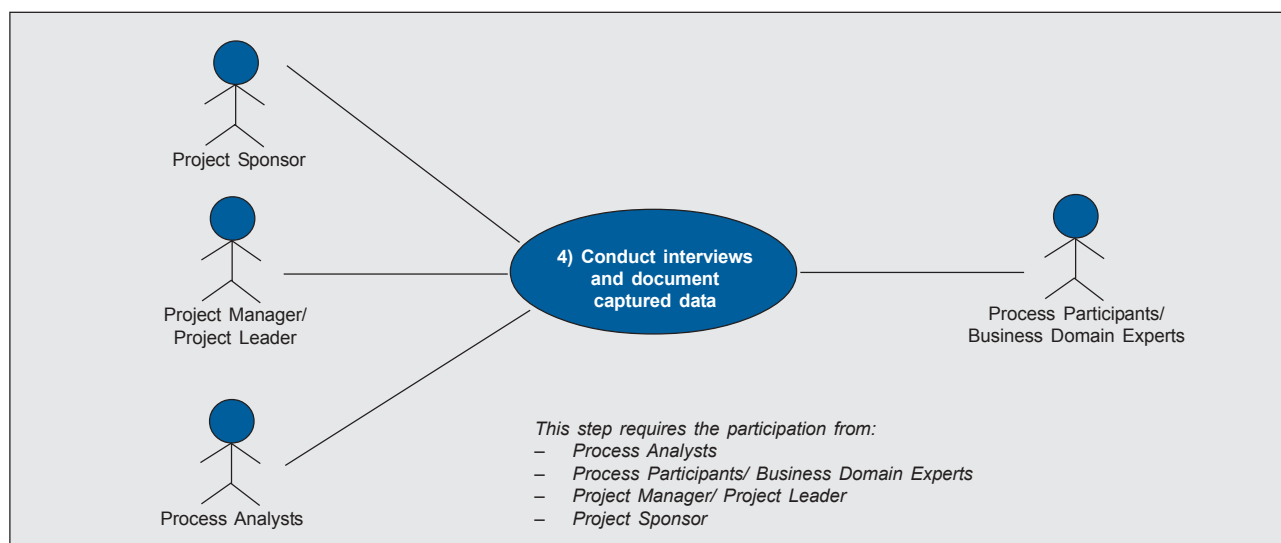
- Activity diagrams

- Process descriptions, including a list of relevant forms and documents as well as laws, rules and regulations

- Time-procedure charts

The stakeholders and activities involved in this step are shown in Figures 3.8. and 3.9.

Activity 4.1

Process analysts contact potential interviewees by phone or email to agree on the date, time and venue of the face-to-face interview. As noted before, potential interviewees are selected based on their involvement in a business process area of interest and the type of information that they can provide. Process par-

Figure 3.9. Activities involved in Step 4
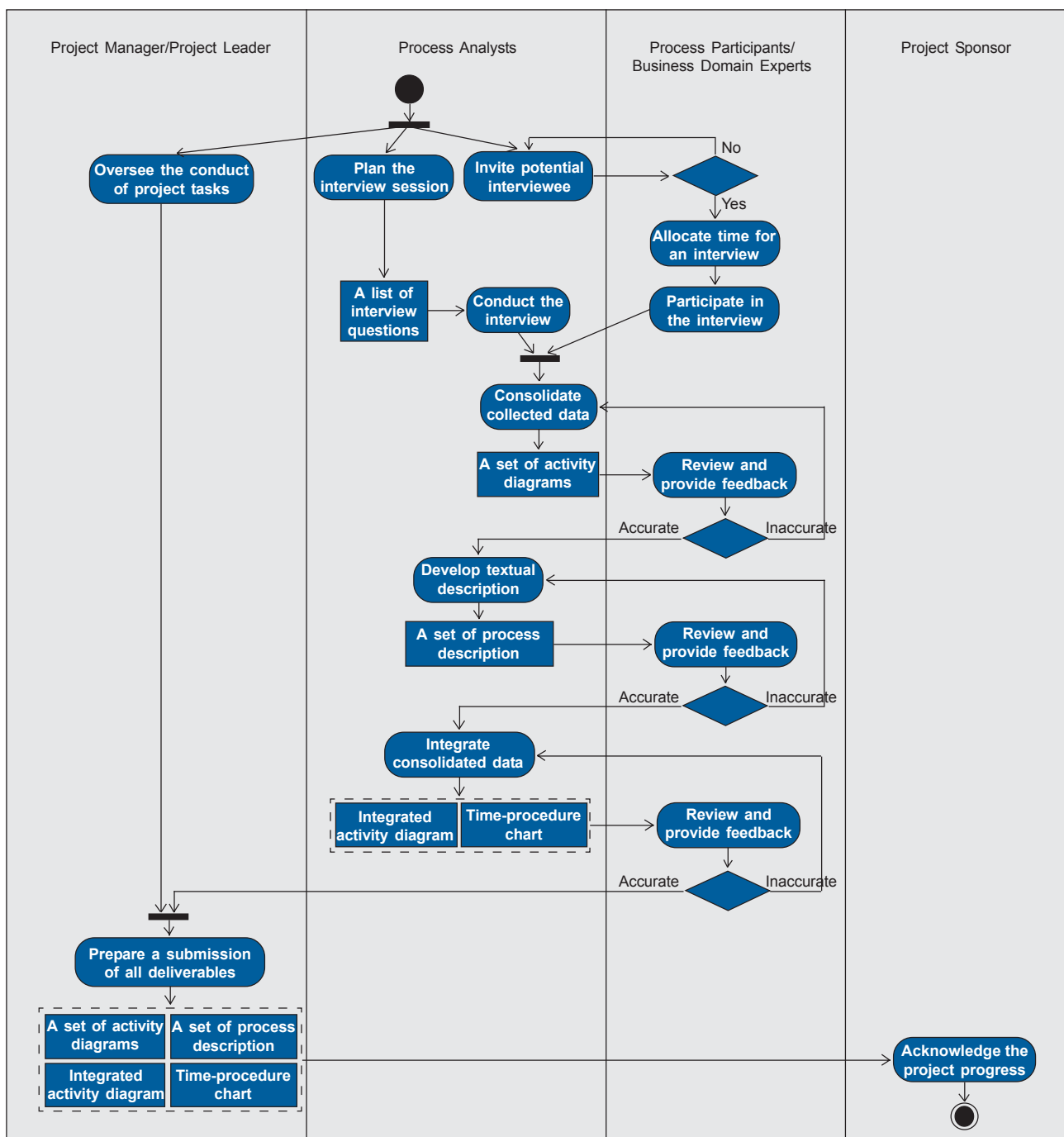
ticipants/business domain experts who are in charge at the operational levels have relatively more potential as interviewees, as they usually deal with respective procedures and formalities associated with the business process of interest on a daily basis.

It is important that process analysts have sound communication skills. Prior to inviting the potential interviewees, process analysts need to introduce themselves in a polite, friendly, and professional manner. Process analysts also need to clearly explain the purpose of the interview, how this interview will contribute to the overall business process analysis exercise, what will be the results of this exercise and how these will be used. Doing so allows them to establish a good

rapport with the potential interviewees. Establishing a good rapport not only increases the chance of having potential interviewees participate effectively in the planned face-to-face interview, but also helps create a pleasant atmosphere during the interview. Pleasant atmosphere is a vital precondition for a successful and result-oriented interview session.

Activity 4.2

Process participants/business domain experts decide if they wish to participate.

If process participants/business domain experts agree to participate, they inform process analysts when it is convenient to have a face-to-face interview. If not, process analysts look for

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Box 3.7. Examples of interview questions

Business process analysis:

- How many people are involved in this business process?
- What are necessary activities that an exporter/importer has to take in order to acquire a particular document?
- What are supplementary documents that an exporter/importer has to submit along with the application form when a particular document is requested?
- How can an exporter/importer who is to submit the application form collect the requested document (manually or electronically)?
- Are copies of documents accepted in lieu of original documents?
- Is there any fee that an exporter/importer has to pay in order to acquire the document? If so, how much?
- What are the laws or regulations associated with these procedural and documentary requirements?
- Which business processes can be carried out in parallel?
- Which business process has to be carried out next?

Information flow analysis:

- With which other actor in the business do you need to communicate?
- What kind of data do you exchange?
- What kind of information do you send to which actor?

Time analysis:

- How much time, including waiting time, in average hours or days does it take to complete this entire business process from the beginning to the end? What is the maximum and minimum time?
- How many actual man-hours does it require to complete this particular activity in this business process?

Cost analysis:

- How much on the average does it cost to complete this particular activity in this business process or to process one document?

Suggestions for improvement:

- What are problems/bottlenecks you encounter in procedures and regulations to import or export?
- What are improvements that you would like to see in the near future?

other potential interviewees who can substitute for the person who rejected an interview.

Activity 4.3

Process analysts prepare a list of questions based on the background information acquired earlier. The questions need to be easy to understand and structured in a logical sequence to ensure the best possible result. The questions should allow the process analysts to gain a better understanding of those points they have previously found unclear. Examples of such interview questions, which were generalized from the Frozen Shrimp Export Process Analysis, are provided in Box 3.7.

Activity 4.4

Process analysts conduct the face-to-face interviews with the process participants/ business domain experts. It is recommended that the following issues are taken into account.

- Each face-to-face interview session is attended by one, or in specific cases, by at maximum two process analysts. Having two process analysts in the session is in fact necessary when the process analysts are relatively new to the field, or have little experience in conducting business process analysis.

- If the interview is tape recorded, it is necessary to obtain permission from the interviewee prior to the interview.

- Although the process analysts conduct the interview session with prepared questions which are organized in a logical sequence, the interview is unlikely to be a question and answer session. Therefore, it is recommended to keep the interview free-flowing and conversational, however within a basic structured framework. The best way is to start with general questions to draw information about a particular business process that is common to all operational cases. The general questions are then followed by more specific questions not only to seek clarifications but also to identify discrepancies and conditions where such discrepancies occur. Process analysts should adjust their questions according to how the interviewee is responding. They

may also inject their opinions or ideas to stimulate the interviewee to express and elaborate his/her ideas related to the subject matter.

- During the face-to-face interviews, the process analysts should also seek interviewees' opinions and observations on any bottlenecks and issues related to the process, documents, laws, and regulations that should be improved, why and how to improve them.

- Process analysts should take notes carefully. All points the interviewees make should be written down, even though they may sound irrelevant at the moment.

- Process analysts should provide feedback on statements made by the interviewees to confirm their correctness and understanding of the obtained information.

- Process analysts should always respect the time schedule. A summary of the major points should be made before ending the interview session.

Activity 4.5

Process analysts consolidate all the statements made by interviewees into an activity diagram for each use case immediately upon their return to the office. This work should be completed within maximally two working days after the interview.

An activity diagram portrays a sequence of activities carried out to achieve a specific goal. It illustrates detailed activities and flows of information or documents from one responsible party to another in a given sequence. During this step, the process analysts might discover common patterns in the activity diagrams. Reusing these patterns helps avoid repetition of work and save time. For example, the customs declaration process from the business process analysis of exporting frozen shrimp can be reused in a business process analysis for exporting frozen poultry products. Table 2.2 presents the basic elements and notations of an activity diagram that is applied in this business process analysis study. Box 3.8 illustrates an example of an activity diagram.

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Activity 4.6

Process participants/business domain experts review the activity diagrams and then provide feedback.

Activity 4.7

Process analysts revise and/or refine individual activity diagrams, as necessary.

Activity 4.8

Process analysts provide textual description of individual activity diagrams.

Process description has to include the following elements:

a) The name of a process area which this particular business process belongs to;

b) The name of a business process;

Box 3.8. Case Study – Activity diagram of "Have the product sampled and examined" use case within the BPA of frozen shrimp export in Thailand
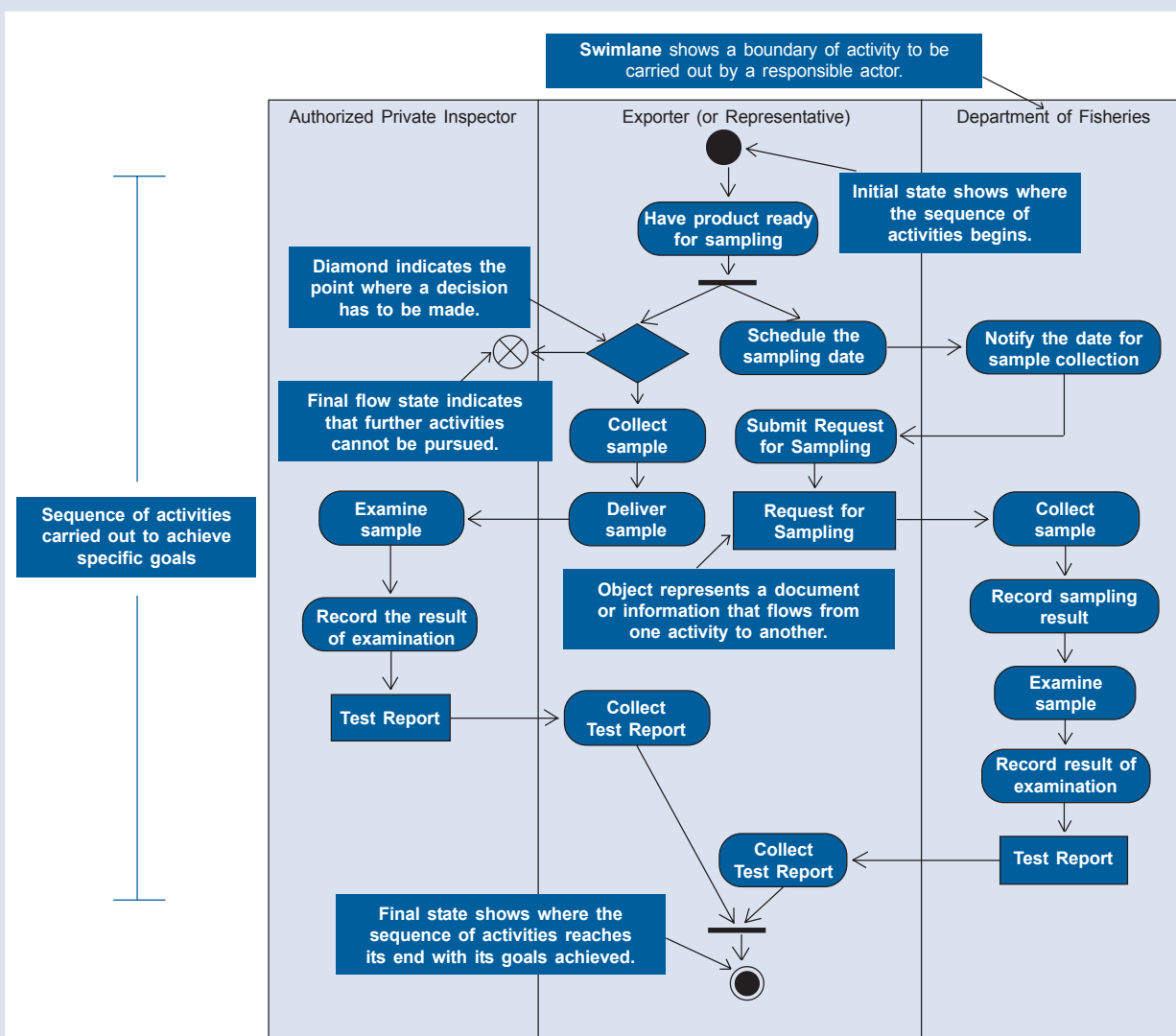
Soure: ESCAP from the Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University.

c) Related rules and regulations;

d) The name of responsible parties;

e) Input and criteria to enter/begin the business process;

f) Procedures and associated documentary requirements to complete the process;

g) Output and criteria to exit the business process; and

h) The average time required to complete the process and/or durations for each involved transaction.

Activity 4.9

Process participants/business domain experts review process description and then provide feedback.

Box 3.9. Integration of activity diagrams chart from the BPA of frozen shrimp export in Thailand
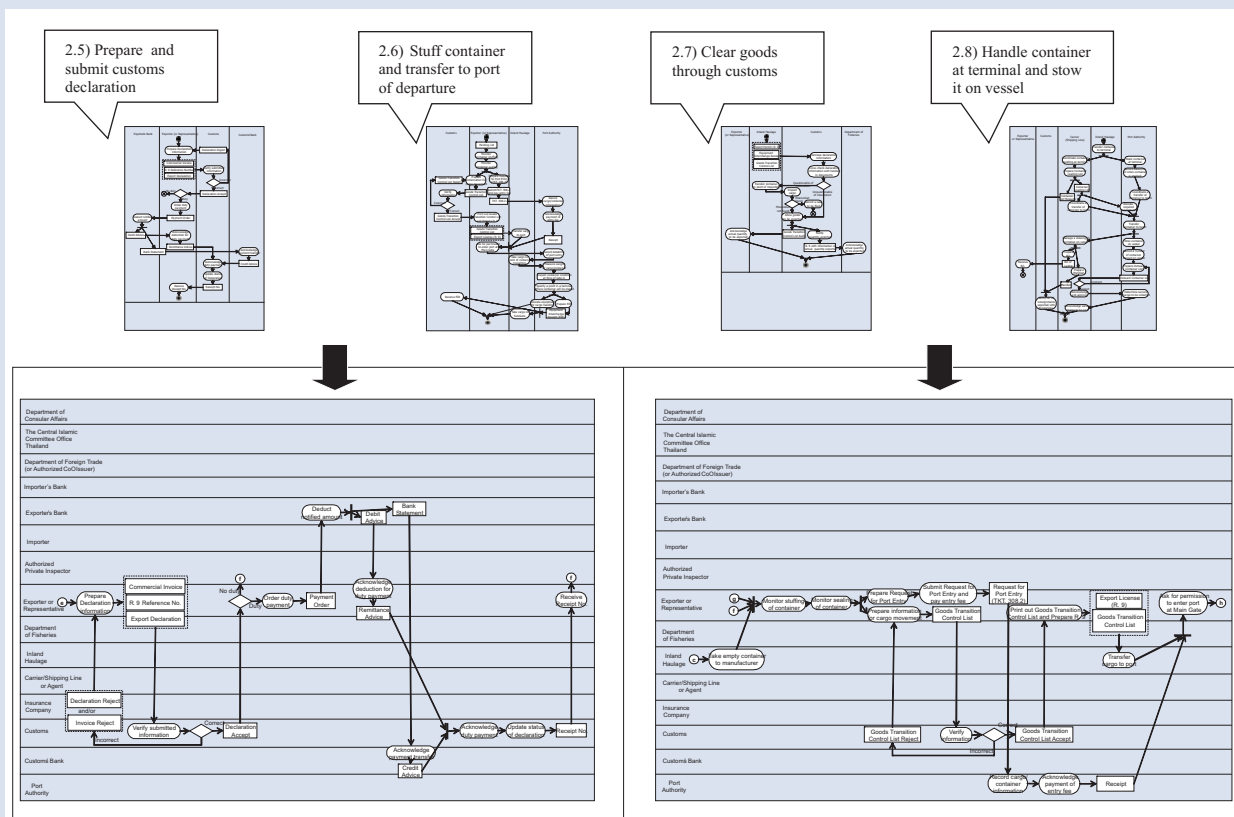
The above diagram illustrates the integration of some business processes (use cases) that have to be carried out in order to export frozen shrimp from Thailand. The use cases shown in this diagram include "prepare and submit customs declaration", "load container and transfer to port of departure", "clear goods through customs", and "handle container at terminal and stow it on vessel". In the horizontal swimlanes, all process participants involved in exporting frozen shrimp from Thailand are listed. As can be seen from the top, they are Department of Consular Affairs, the Central Islamic Committee Office Thailand, Department of Foreign Trade or Authorized Certificate of Origin Issuer, Importer's Bank, Exporter's Bank, Importer, Authorized Private Inspector, Exporter or Representative, Department of Fisheries, Inland Haulage, Carrier (Shipping Line or Agent), Custom's Bank, Port Authority.

Source: ESCAP from The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University

Activity 4.10

Process analysts revise and/or refine process description of each activity diagram, as necessary.

Activity 4.11

Process analysts work together to integrate all activity diagrams of the business processes associated with all use cases defined earlier into a single integrated activity diagram. The integrated activity diagram represents an interconnected view of business processes used in an industry or to provide a particular service. It illustrates relationships between core business processes, process participants, and information flow throughout the area under the scope of the study. An example of an integrated activity diagram is provided in Box 3.9.

Activity 4.12

Process analysts develop a time-procedure chart based on the average time required to complete one business process represented by one use case. The development of a time-procedure chart should be in line with the World Bank methodology used in the *Trading Across Borders* study of the *Doing Business* project.[8] An example of the time-procedure chart is provided in Box 3.10.

Activity 4.13

Process participants/business domain experts review the integrated activity diagram and time-procedure chart, and then provide a feedback.

Activity 4.14

Process analysts revise and/or refine the integrated activity diagram and time-procedure chart as necessary.

Activity 4.15

Project manager/project leader, in addition to overseeing the project tasks carried out by process analysts, consolidate all deliverables achieved in this step for a submission to project sponsor.

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[8] World Bank, The *Doing Business* project, http://www.doingbusiness.org

Activity 4.16

Project sponsor acknowledges the completion of the documentation of existing business processes.

Phase III: Process analysis and recommendations development

A better understanding of the "as-is" processes is obtained once the processes are defined and documented. Activity diagrams, process descriptions listing all documentary requirements, the associated documents, laws, rules, and regulations as well as time-procedure charts have been prepared to provide the stakeholders with an overall and integrated view of the current situation and the discovered problem areas. Based on these inputs, recommendations for improvement can be developed. International recommendations on trade and transport facilitation and best practices such as UN/CEFACT Recommendation 18 (see Box 3.11), can be considered and applied. The logical steps in this phase include:

> Step 5 - Analyse the "as-is" processes and identify bottlenecks
> Step 6 - Develop and propose recommendations

Step 5: Analyse the "as-is" processes and identify bottlenecks

The purpose of Step 5 is to identify the bottlenecks of the "as-is" processes described in the activity diagrams, the process descriptions, and the time-procedure chart. It aims at developing a set of observations related to the current business processes that have potential for improvement, such as the identification of duplicated and redundant procedural and documentary requirements which cause delays. Figure 3.10 shows stakeholders participating in Step 5.

Illustration of necessary activities that have to be conducted in order to analyse the "as-is" business processes and identify the bottlenecks is provided in Figure 3.11.

Activity 5.1

Process analysts identify the bottlenecks and record observations related to the current "as-is" business processes that have the potential for improvement.

To locate the bottlenecks, process analysts may first review the time-procedure chart, as it visualizes those particular business processes that require an extensive time to complete. They can then examine the relevant activity diagram together with the associated process description to learn what may cause the long delays. The potential causes of such problems may include duplicated and redundant procedural and documentary requirements, as well as outdated laws or unnecessary regulations that create operational obstacles.
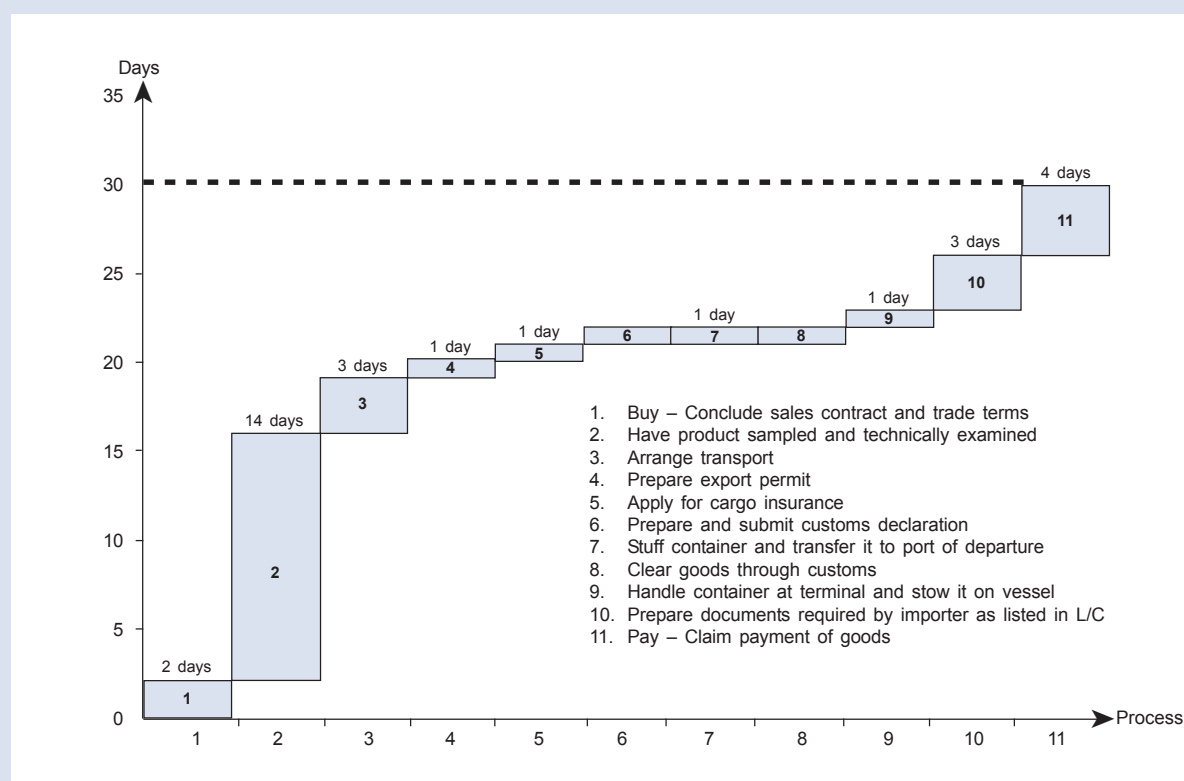
Activity 5.2

Project manager, process participants/business domain experts, and project sponsor review a set of observations listing bottlenecks in the "as-is" business processes and provide feedback.

Activity 5.3

Process analysts revise/refine it as necessary.

Box 3.10. The time-procedure chart from the BPA of frozen shrimp export in Thailand

1. Buy – Conclude sales contract and trade terms
2. Have product sampled and technically examined
3. Arrange transport
4. Prepare export permit
5. Apply for cargo insurance
6. Prepare and submit customs declaration
7. Stuff container and transfer it to port of departure
8. Clear goods through customs
9. Handle container at terminal and stow it on vessel
10. Prepare documents required by importer as listed in L/C
11. Pay – Claim payment of goods

This time-procedure chart is an illustration of the time required to complete each business process in the business domain of interest. It assists the process analysts in spotting where possible bottlenecks are. While each bar on the x axis represents an individual procedure within a business process, the y axis represents the average total time (number of days, in this case) required to complete that particular procedure.

Source: ESCAP from The Analysis of Frozen Shrimp Export Process in Thailand, Institute for Innovative IT, Kasetsart University

Box 3.11. UN/CEFACT Recommendation No. 18: Facilitation Measures Related to International Trade Procedures

UN/CEFACT Recommendation No. 18 provides a comprehensive set of recommendations regarding international best practices and standards for the facilitation and harmonization of trade transactions. In order to understand the complexity of international trade, including the key elements of a trade transaction, UN/CEFACT developed a model of the international supply chain. Based on this model, specific measures were developed to cover the key elements of the trade transaction process. These are presented under four major categories, namely: commercial measures; international payment measures; official control measures; and transport-related measures.

Recommendation No. 18 is targeted both at companies involved in the business of trade, and at national governments and national and international organizations related to trade. The Recommendation should be especially relevant to transition and developing countries which can still significantly improve their economic performance by streamlining international trade procedures. There are some general principles appropriate for officials and a dedicated section: "Group 3: Measures related to official controls". Here are some examples:

Procedures and data requirements

- Procedures should be kept to a minimum. They should be commercially oriented and relate closely to trade and transport requirements. Procedures should be simplified, harmonized and should comply with international standards.
- Data requirements should be kept to a minimum, and should be simplified, harmonized and standardized, to ease the information flow.
- Laws, regulations and other information regarding procedures and data requirements should be readily accessible to all parties concerned.

Information technology

- Transition strategies to replace paper documents by electronic information exchange or electronic documents are common practice. The use of information and communication technology and the resulting electronic solutions should be encouraged.

Recommended measures related to official controls

- *Predictability:* The time required, the procedures used and the fees related to official regulations should be predictable.
- *Transparency:* All relevant information of general application pertaining to official rules and regulations, including information about procedures and control requirements, should be made available to the business community as well as to government bodies.
- *Cost-benefit analysis:* Before introducing new requirements or prolonging existing rules for inspection, control and testing of goods in international trade, the authorities concerned should make cost and benefit assessments of proposals in consultation with the business community.

These recommendations provide further input for possible improvements at this stage of the BPA. Several "to-be" models might be set up to and compared to identify the optimal solution.

UN/CEFACT Recommendation No.18 can be downloaded in English, French and Russian version from: http://www.unece.org/cefact/recommendations/rec_index.htm

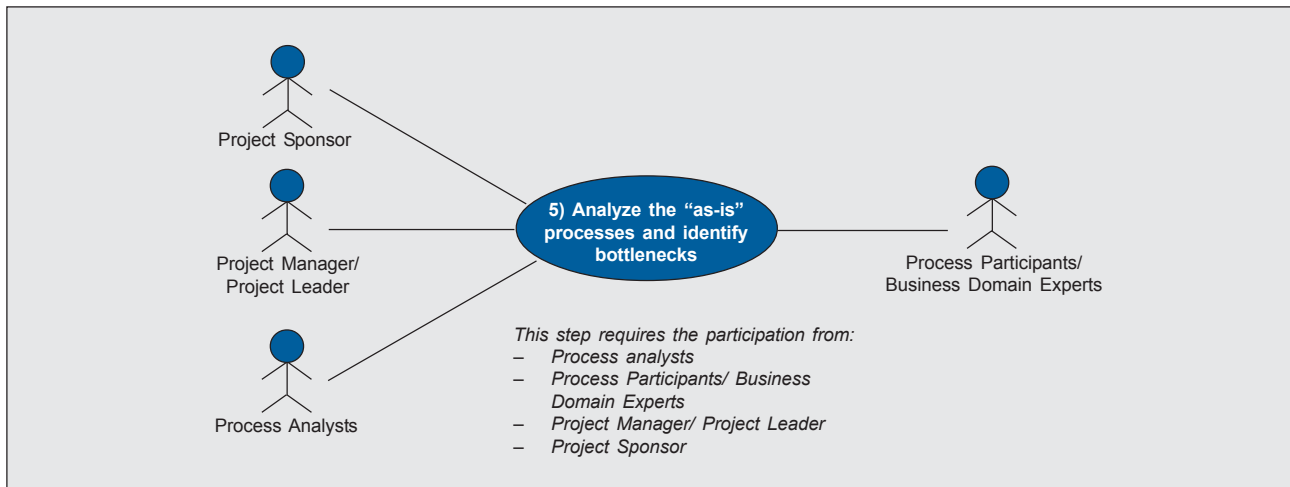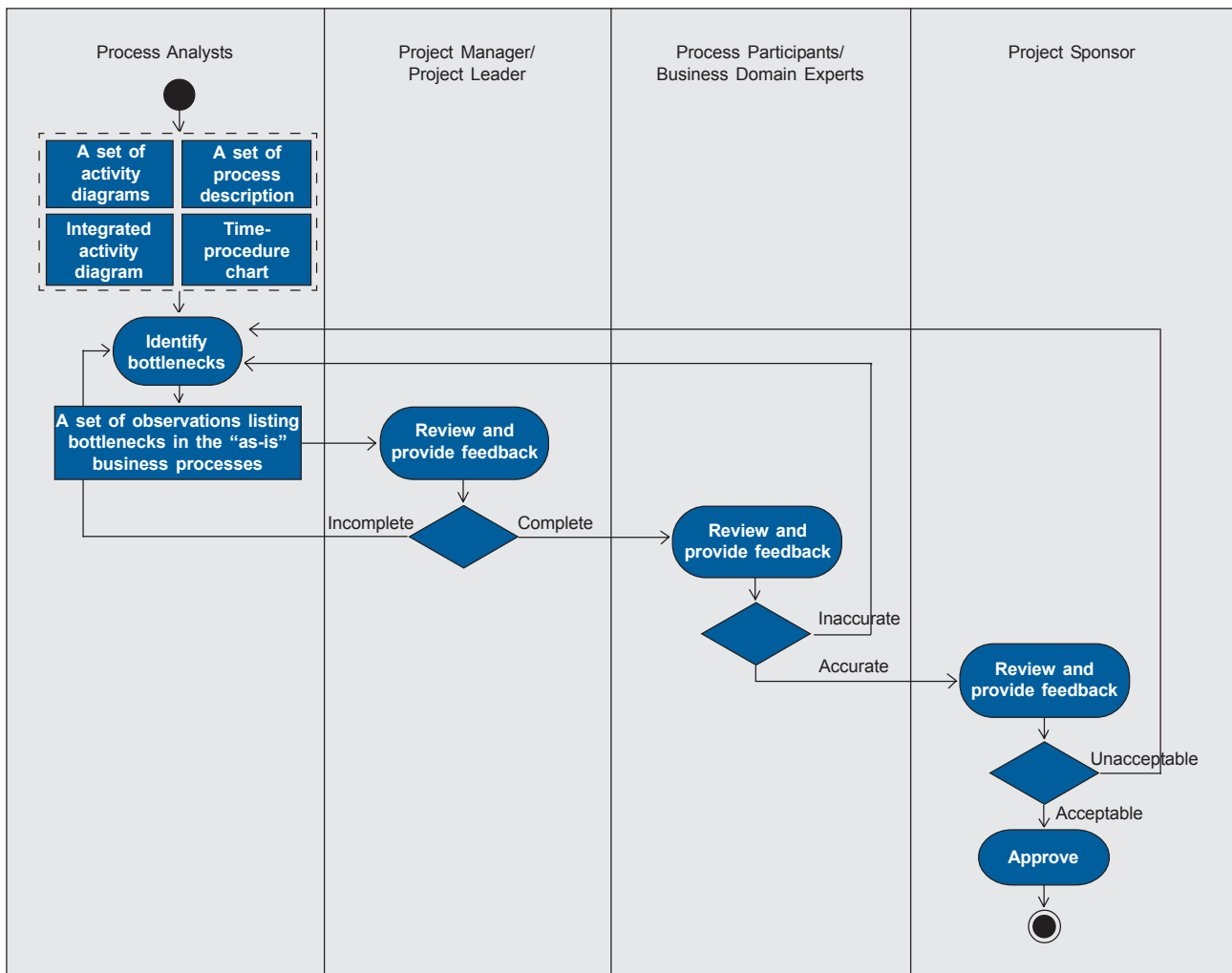## Figure 3.10. Stakeholders involved in Step 5

Figure 3.11. Activities involved in Step 5

Activity 5.4

Project sponsor, in consultation with process participants/business domain experts and project manager/project leader, approves the observations.

Step 6: Develop and propose recommendations

The objective of this step is to develop and propose recommendations that help eliminate bottlenecks and inefficiencies of procedures and documentary requirements within the examined business process. Such recommendations can also focus on enhancing transparency in trade procedures or introduce new security measures that would not be contradictory to trade facilitation. The measurable benefits of implementing such recommendations may include the reduction in time and cost in international trade, as well as an increase in trade and foreign direct investment.

Figures 3.12 and 3.13 illustrate the stakeholders and activities involved in this step.

Activity 6.1

Process analysts develop and propose recommendations for business process improvement. Business process improvement can take various forms. It may include the following measures:

- Elimination of redundant procedures

- Merging of some procedures that may also lead to the elimination of duplicate or unnecessary documentary requirements

- Modification of relevant laws and regulations in a way that better facilitate business operations

- Automation of relevant procedures and data exchange.

For example, the automation of paper-based transactional operations can be either implemented as a full-scale trade and transport information exchange among stakeholders (paperless trade) or automated customs clearance systems such as ASYCUDA.[9] UN/CEFACT Recommendation No. 18 on Facilitation Measures Related to International Trade Procedures may provide background information on trade facilitation measures, including how to simplify and harmonize the trade transaction procedures, documentary requirements, rules, and regulations (see Box 3.11).

In line with the recommendations, process analysts prepare a set of responding activity diagrams that represents the "to-be" business processes.

Activity 6.2

Process participants/business domain experts, project manager/project leader, and project sponsor review and provide feedback on proposed recommendations for the business process improvement, which may include a set of activity diagrams representing the future "to-be" business processes. The proposed recommendations and the newly designed business processes may act as an intuitive tool to support a discussion with the corresponding authorities.

Activity 6.3

Process analysts gather the feedback and revise and refine the recommendations and the activity diagrams representing the "to-be" business processes as necessary.

Activity 6.4

Project sponsor, in consultation with process participants/business domain experts, approves the recommendations.

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[9] ASYCUDA (Automated System for Customs Data - http://www.asycuda.org) is a computerized customs management system, developed and provided by UNCTAD. The system handles manifests and customs declarations, accounting procedures, transit and suspense procedures.

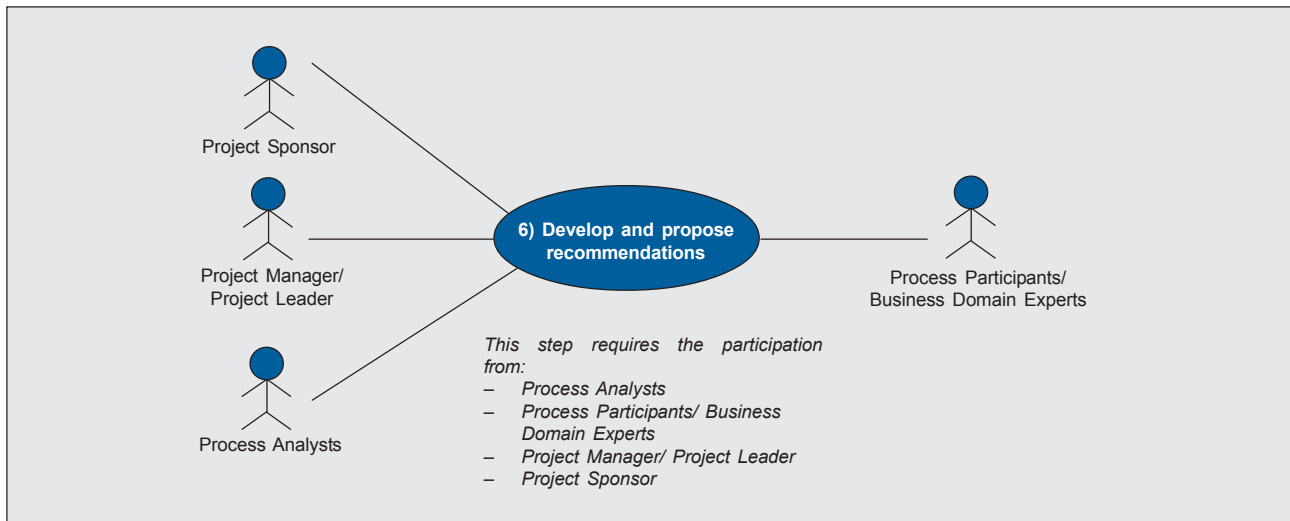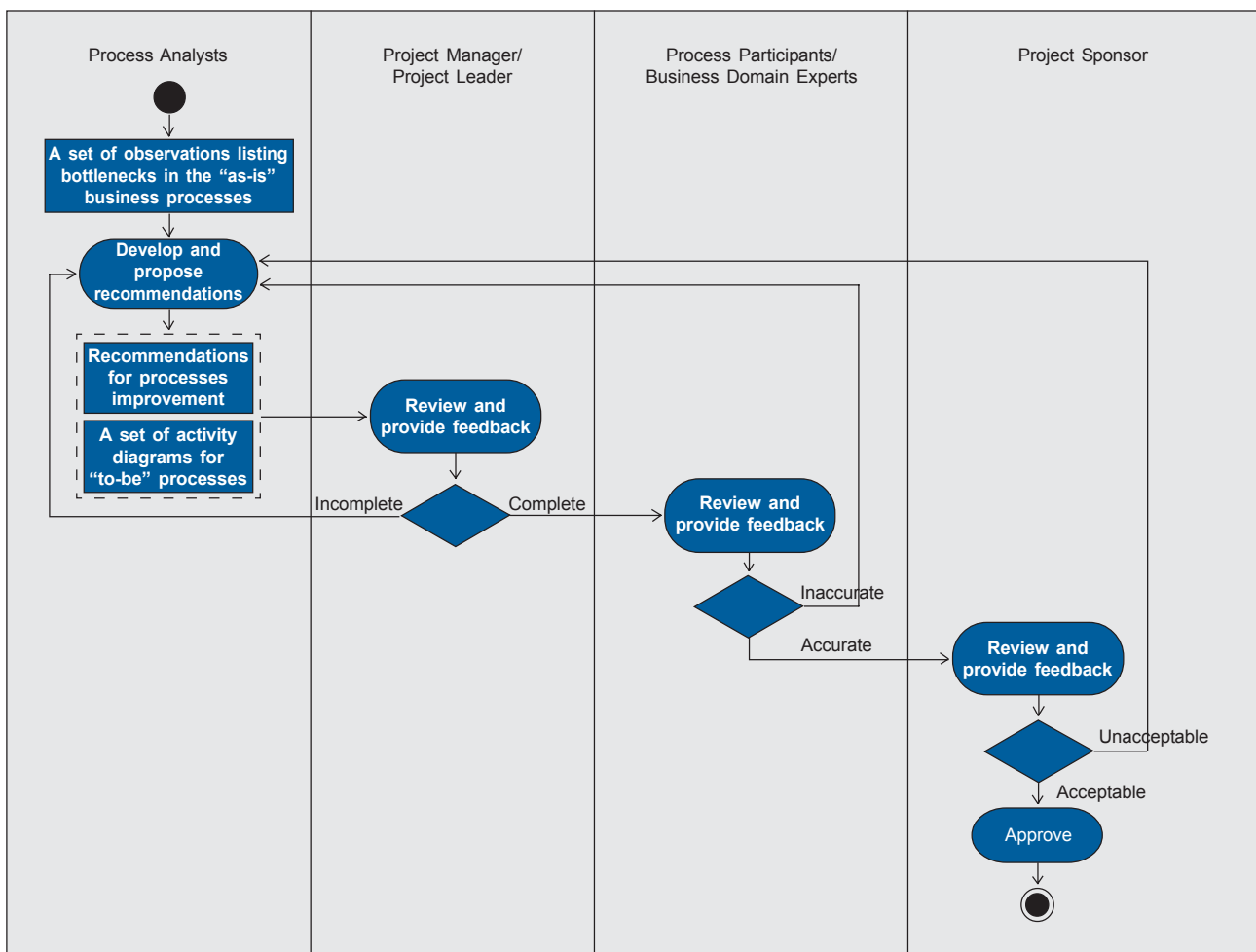**Figure 3.12. Stakeholders involved in Step 6**

Figure 3.13. Activities involved in Step 6

4. RECOMMENDATIONS FOR IMPLEMENTATION

Trade facilitation measures such as the simplification, harmonization, and automation of procedures and documents involve interagency coordination and collaboration. Their successful implementation requires not only political and governmental support in terms of both policy directives and human and financial resources, but also an in-depth understanding about existing business processes, including their related information flows, laws, rules, and regulations.

Analysis of business processes involved in moving goods across borders is, therefore, a necessary exercise that must be carried out prior to implementing any other trade facilitation measure. Trade facilitation measures, in other words, cannot be applied without locating the source of problem areas, bottlenecks and redundancies.

The following recommendations are outlined to assist the policymakers and trade facilitation practitioners in setting up the BPA project.

- **Get buy-in from the officials:** Convey the necessity of trade facilitation and business process analysis through awareness-raising programmes – starting at the top. Educate both relevant government officials and the trade and transport community on the necessity of business process analysis and its potential return on investment for all stakeholders in the long run.

- **Adequate resources:** Secure adequate human resources and funding. Obtain a mandate from top government officials for the members of the business process analysis team, which may be from an outsourced third party.

- **Roles and responsibilities of the project stakeholders:** Identify clearly the roles of agencies, as a project sponsor, project manager/project leader, process participants/business domain experts.

- **Choose a champion:** Determine a lead agency that is capable of guiding the conduct of BPA and facilitating the communication among business process analysis stakeholders. Choose the business process analysis champion wisely. Avoid the "ivory tower dictator" approach. Instead, nominate the party with efficient and effective team-player skills.

- **Start small, and then evolve:** Chose the right starting point and form an effective team, which is critical to succeed. If the team members of the business process analysis project are new to the BPA, start with a relatively smaller scope. See what works for the project and learn from that. Drop steps that do not work. It is important to start small and demonstrate success, then to build on that success. As a general rule, the wider the scope, the more difficult it is to choreograph the initial project, but the bigger is the opportunity to improve processes.

- **Profit from experience:** Keep in mind that the learning experience gained during the initial phase helps accelerate the business process analysis tasks at the later stage. Make use of the learning effect; start with simple processes and engage complex issues later on. This avoids frustration and repetition of efforts. Also try to benefit from international best practice and expertise. Studies and case studies can be obtained from various standard development organizations and trade facilitation bodies.

- **Invest in training:** Train the staff that disseminates relevant knowledge about the business process analysis and familiarize the business process analysis team about the common methodology that all members must follow.

- **Performance measurement:** Set realistic benchmarks to be achieved after the "to-be" processes are in place. Performance indicators of an optimum best practice country[10] can be taken as a model.

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[10] Refer to the World Bank's study on *Trading across Borders* as one of the performance benchmarkings, http://www.doingbusiness.org

5. GLOSSARY

Activity Diagram – a graphical representation that describes the flow of activities carried out by stakeholders involved in a particular business process. The activity diagram is a type of diagram that uses a set of notations defined by the Unified Modeling Language (UML).

Automation – the application of information and communication technologies to facilitate the manual operation of business processes.

Business Process – a logical series of related transactions that converts input to results or output. A business process considered within the frame of trade facilitation in this paper can be defined as "a chain of logically connected activities to move goods and related information across borders from buyer to seller and to provide related services".

Business Process Model – a graphical representation of a business process. It illustrates (i) activities performed and decision points, (ii) actors who perform those activities, (iii) activities' input and output, (iv) alternate routes of activities subject to different business rules and conditions, and (v) criteria for entering and exiting the business process. The process model also demonstrates how the various actors relate to one another and how the information flows throughout the business process. The process model has become increasingly important in the area of trade facilitation. It serves as an organizational blueprint that facilitates the identification of bottlenecks, the prioritization of areas for improvement and improvement strategies, and the design of automated systems to promote paperless trade. It also enables the benchmarking of process improvement after implementing the improvement initiatives.

Business Process Modeling – a technique for documenting business processes where each element of the business process is represented by graphical notations. Unified Modeling Language (UML) provides graphical notations for business process modeling that are accepted and widely used not only among practitioners in business community but also those in information technology and software industry. Business process modeling can be achieved by a simple drawing with paper and pencil or a software tool.

Harmonization – the effort to align procedural, regulatory, and/or documentary requirements with relevant standards.

Business Process Analysis – a systematic examination of business processes in order to gain better understanding and to develop improvement strategies.

Simplification – the effort to reduce complexity, in our context, of the trade and transport facilitation processes and documentary requirements.

Single Window – a facility that allows parties involved in trade and transport to lodge standardized information and documents with a Single Window entry point to fulfil all import, export and transit-related regulatory requirements. If information is electronic, then individual data should only be submitted once. UN/CEFACT Recommendation No. 33 and Case Studies on Implementing a Single Window can be found at:

http://www.unece.org/cefact/single_window/welcome.htm/.

Time-Procedure Chart - a chart illustrating relationships between each business process and time (normally in days) required to complete each business process in the business domain of interest. While each bar on the x axis represents a business process (procedure), the

height of the bar associated with the time scale on the y axis represents the average total time required to complete that particular business process.

Trade Facilitation – measures used to simplify and harmonize procedural, regulatory, and/or documentary requirements associated with the international supply chain.

UN/CEFACT Recommendations – a series of more than 30 recommendations developed and maintained by the United Nations Center for Trade Facilitation and Electronic Business (UN/CEFACT). These recommendations are used worldwide as an international best practice to simplify and harmonize trade procedures and information flow.

Unified Modeling Language – a standardized visual specification language for business process and information modeling.

Use Case – a UML notation representing a business process.

Use Case Diagram – a graphical representation that illustrates major elements of the business domain which includes relevant business processes and their stakeholders.

6. REFERENCES

APEC Business Advisory Council (1996). *APEC means business: building prosperity for our community, Report to the Economic Leaders*. Asia Pacific Economic Cooperation Secretariat, Singapore.

Djankov, S., Freund, C., and Pham, C. (2006). *Trading on Time,* World Bank, Washington DC.

Marchewka, J.T. (2006). *Information Technology Project Management,* 2nd ed. John Wiley & Sons Inc., Hoboken, NJ.

UNECE (2001). *Facilitation Measures Related to International Trade Procedures, Recommendation No. 18,* ECE/TRADE/271, New York and Geneva.

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7. ANNEX

BUSINESS PROCESS ANALYSIS OF THE EXPORT OF JASMINE RICE IN THAILAND

This set of diagrams represents business processes involved in exporting a full container load of jasmine rice from Thailand by maritime transport. The study limits the scope of analysis to the delivery of the consignment under the C.I.F. term and the payment by using the letter of credit. In fulfilling procedural and documentary requirements involved in exporting Thai jasmine rice, the exporter indirectly or directly deals with 15 parties. The number of parties that the exporter has to deal with will go up to 17 if the importer requests for the Certificate of Fruit, Food, Vegetable Quarantine and the legalization of trade documents. These parties are 1) exporter or representative, 2) importer, 3) exporter's bank, 4) importer's bank, 5) insurance company, 6) authorized private inspector, 7) inland haulage, 8) carrier (shipping line), 9) Port Authority, 10) Office of Commodity Standards, 11) Department of Foreign Trade, 12) Department of Agriculture, 13) Board of Trade of Thailand, 14) Customs, 15) Thai Chamber of Commerce, 16) Department of Disease Control, and 17) Department of Consular Affairs.

Business processes in the scope of this analysis are categorized into 3 groups according to UN/CEFACT International Supply Chain Model. The first group of business processes is called "Buy". It is concerned with the conclusion of trade terms and the establishment of sales contract. The second group of business processes under investigation is called "Ship". This group of business processes has broad coverage. It ranges from the arrangement of inland and cross-border transportation to the conduct of other necessary actions to meet regulatory requirements of both export and import countries. The last group of business processes in this study is called "Pay" which is about the claim for payment of goods.

Annex Figure 1. Parties involved in exporting rice in Thailand
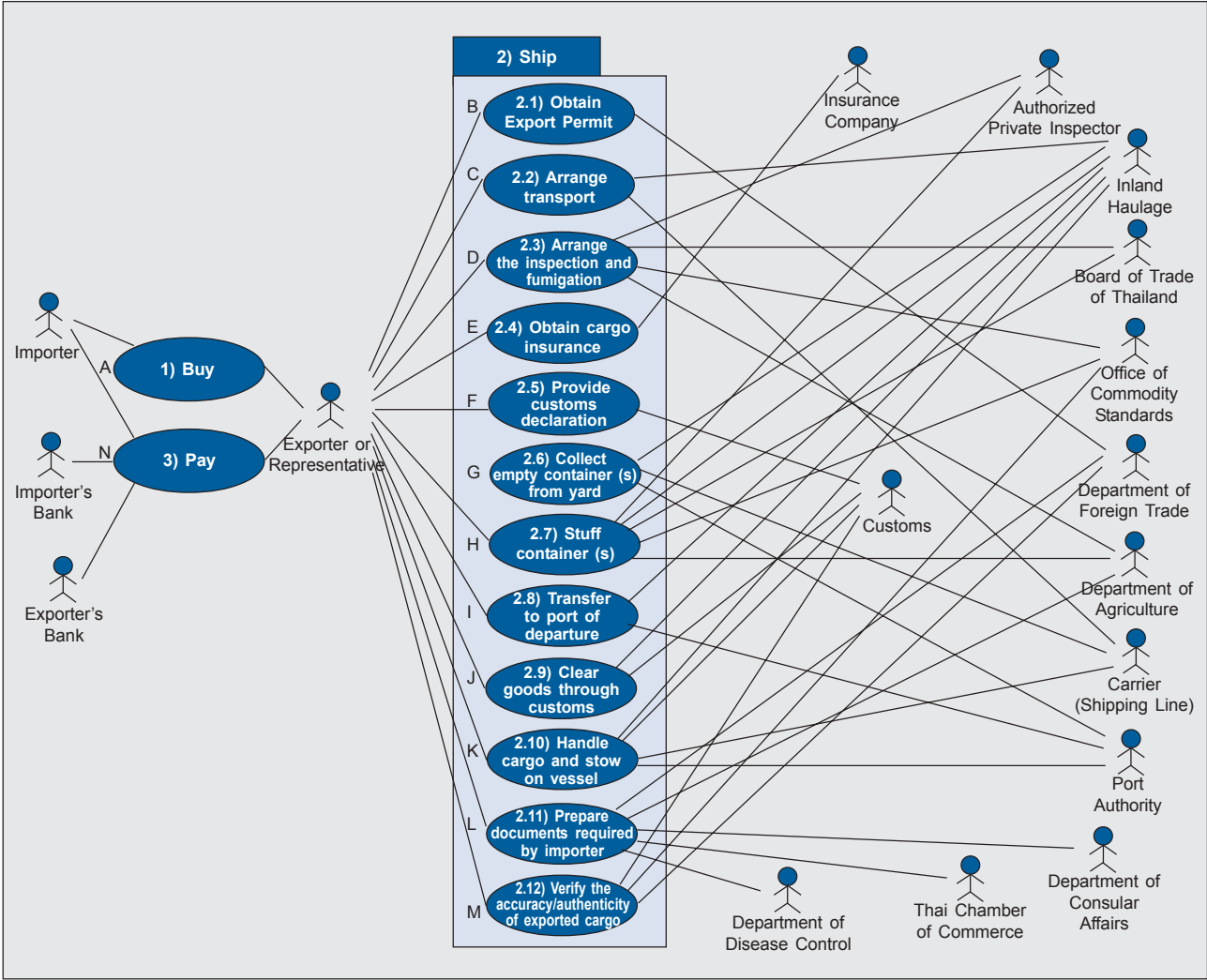
Annex Table 1: List of Documents

1. Proforma Invoice (35)
2. Purchase Order (39)
3. Commercial Invoice (50)
4. Application for Letter of Credit (24)
5. Letter of Credit (32)
6. Packing List (25)
7. Cargo Insurance Application Form (20)
8. Cover Note (23)
9. Insurance Policy (24)
10. Booking Request Form – Border Crossing (24)
11. Booking Confirmation – Border Crossing (31)
12. Booking Request Form – Inland Transport (16)
13. Booking Confirmation – Inland Transport (18)
14. Bill of Lading (40)
15. Empty Container Movement Request (TKT 305) (19)
16. Request for Port Entry (TKT 308.2) (27)
17. Equipment Interchange Report (EIR) (24)
18. Container Loading List (18)
19. Container List Message (32)
20. Outward Container List (34)
21. Master Sea Cargo Manifest (17)

22. House Sea Cargo Manifest (37)
23. Export Declaration (75,39)
24. Good Transition Control List (22,3)
25. Application for Permission to Export Rice (KP. 2)
26. Sales Report (KP 3) (21)
27. Application for the Collection of the Permit for the Export of Rice (A. 3)
28. Permit for the Export of Rice (A. 4) (32)
29. Application for Certificate of Standards of Product (MS. 13/1) (44)
30. Certificate of Analysis (17)
31. Certificate of Product Standards (MS. 24/1) (45)
32. Certificate of Fumigation (21)
33. Application for Phytosanitary Certificate (PQ. 7) (29)
34. Phytosanitary Certificate (34)
35. Application for Certificate of Origin
36. Certificate of Origin (38)

Conditional

1. Application for Certificate of Fruit, Food, Vegetable Quarantine
2. Certificate of Fruit, Food, Vegetable Quarantine
3. Legalization

For the single consignment category, there are 928 data elements in total and 362 without duplicates. These numbers are inclusive of 42 optional data elements that customs would like to collect but they are not mandatory for exporter to provide. For the multiple consignment category, there are 111 data elements in total and 83 without duplicates.

Following are the diagrams of the business process analysis of the export of jasmine rice in Thailand.
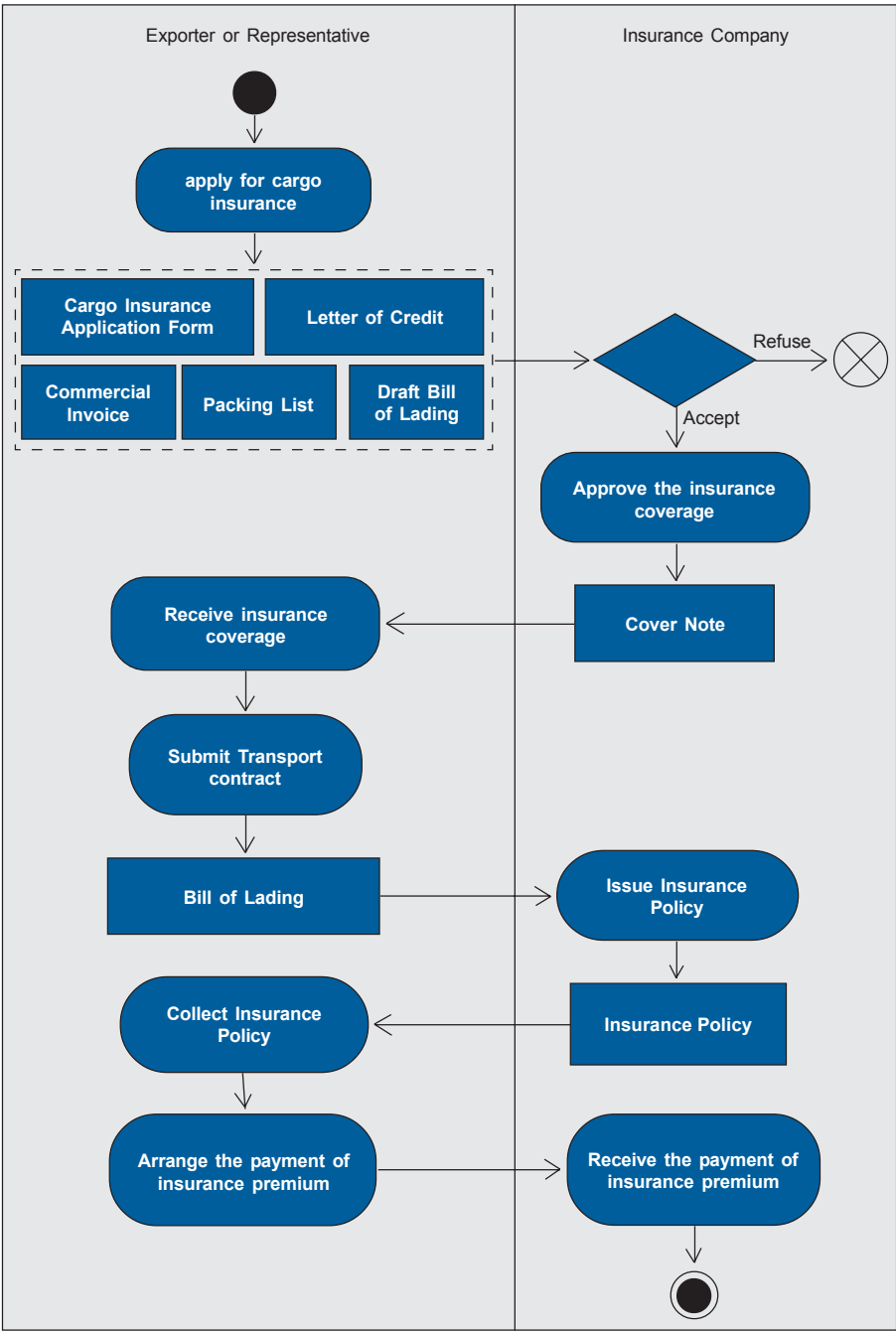
Buy

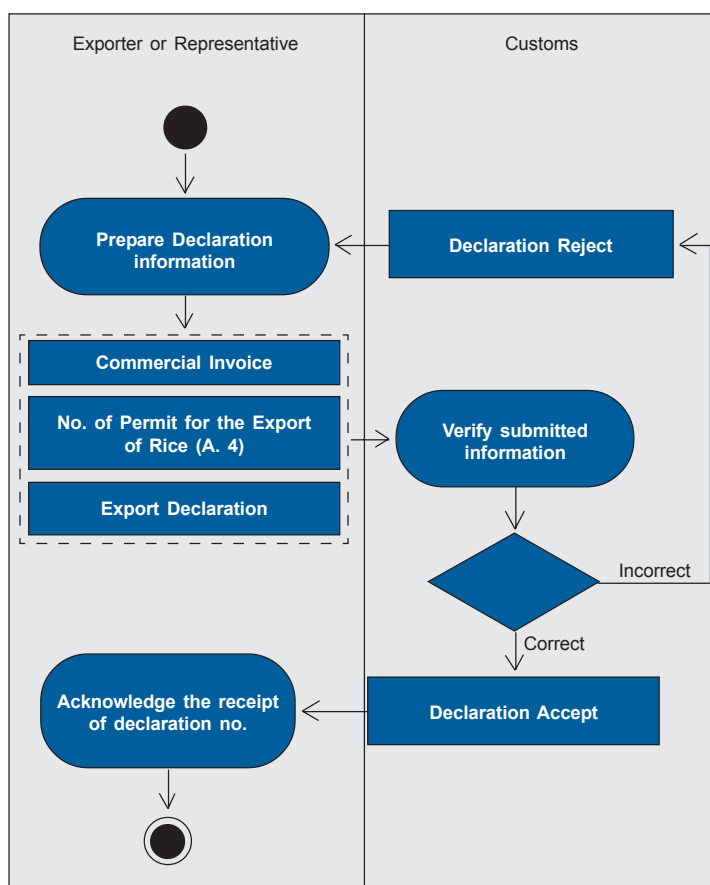## Obtain export permit

Arrange transport

Carrier (Shipping Line)	Inland Haulage	Exporter or Representative

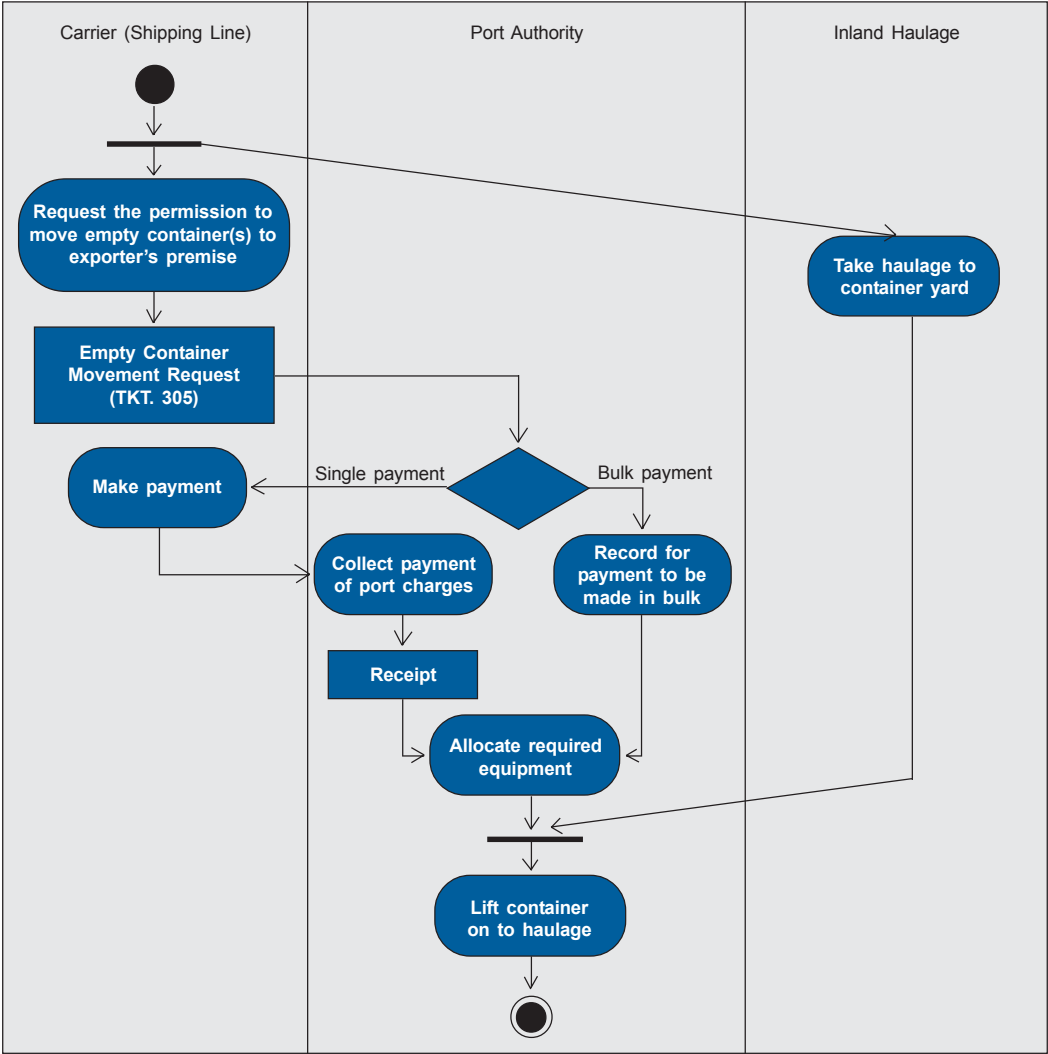## Arrange the inspection and fumigation

Obtain cargo insurance

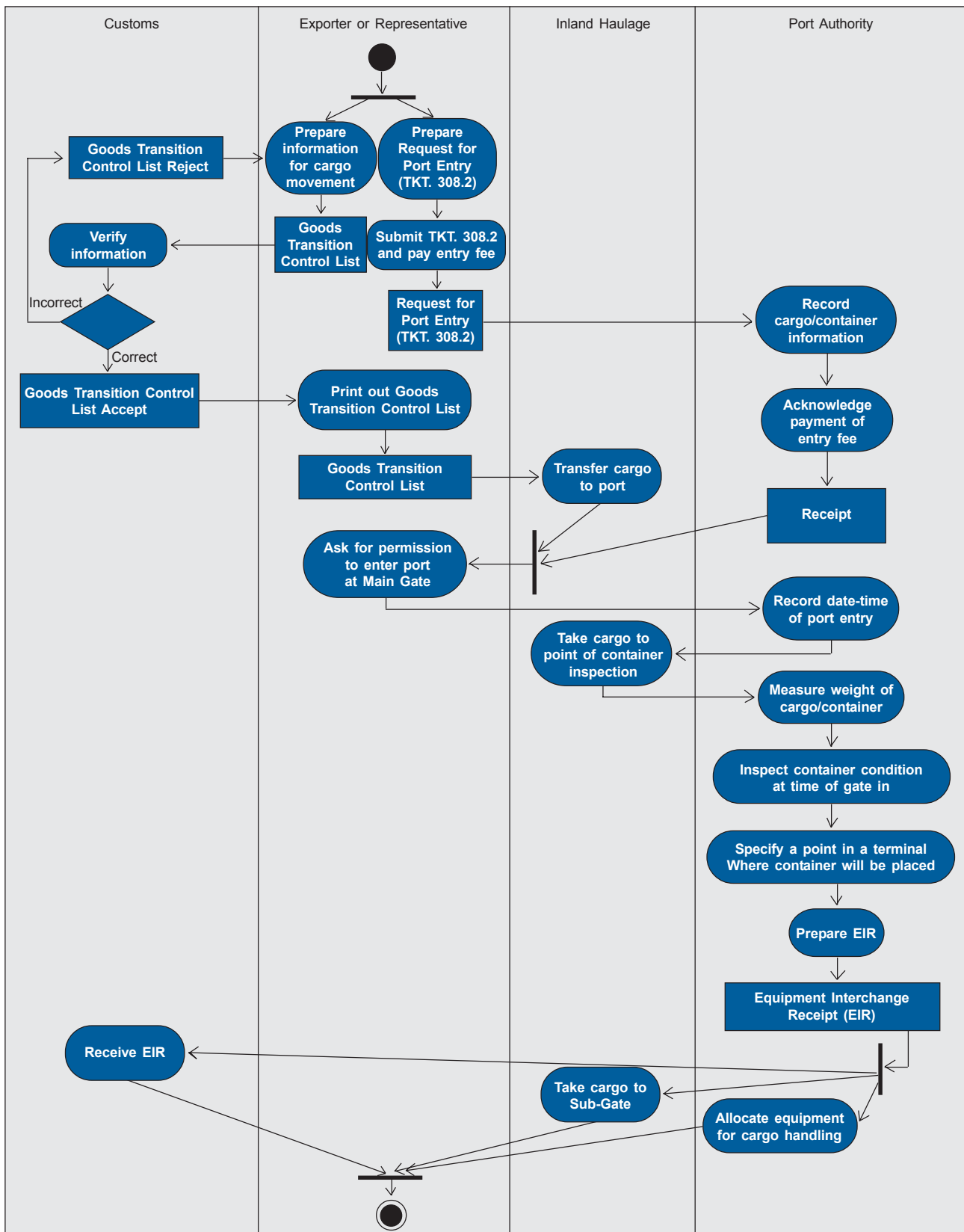## Provide customs declaration

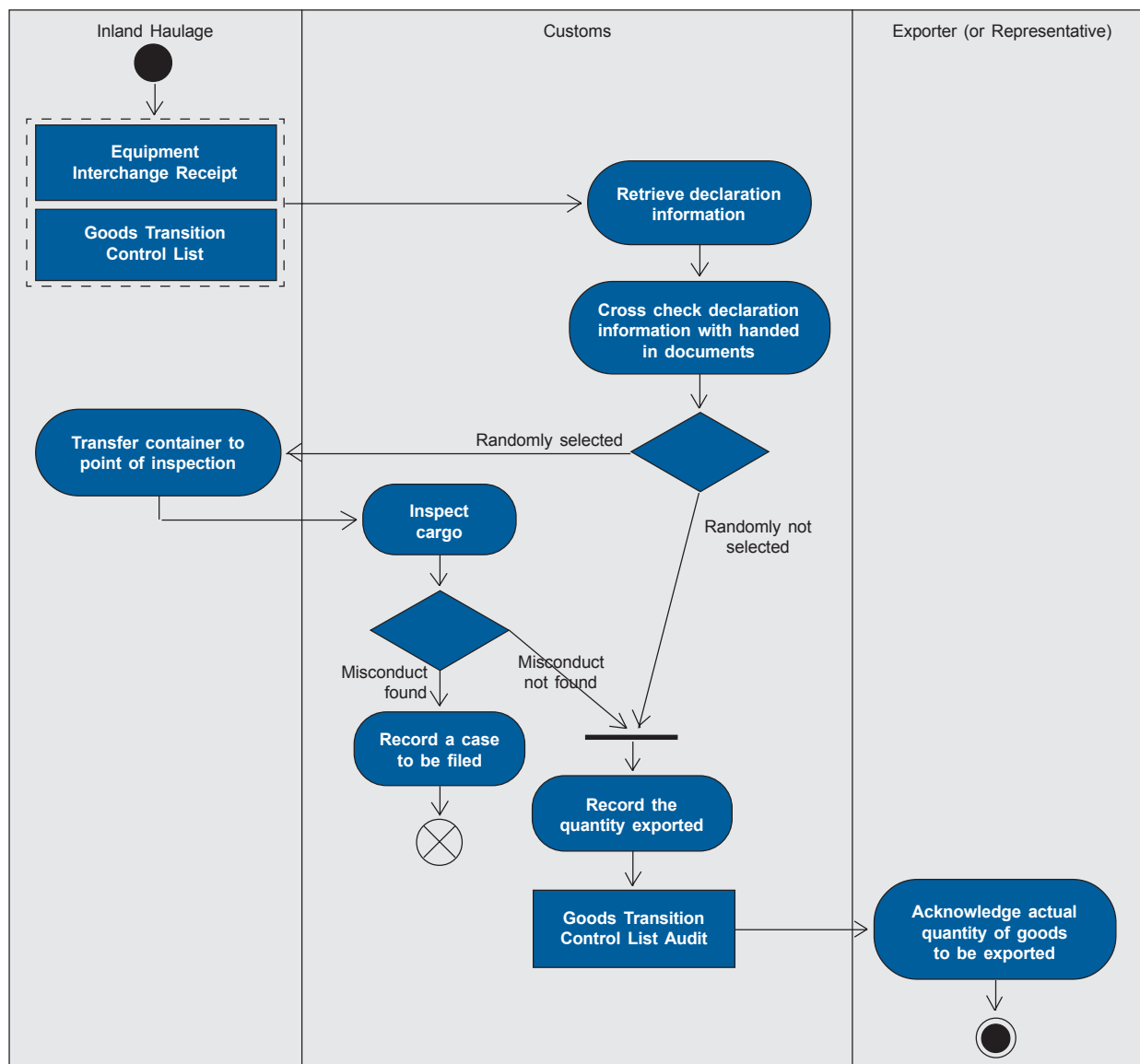## Collect empty container(s) from yard

Carrier (Shipping Line)	Port Authority	Inland Haulage
●		
Request the permission to move empty container(s) to exporter's premise		**Take haulage to container yard**
Empty Container Movement Request (TKT. 305)		
Make payment ← Single payment ◆ Bulk payment → **Record for payment to be made in bulk**		
	Collect payment of port charges	
	Receipt	
	Allocate required equipment	
	Lift container on to haulage	
	◉	

Stuff a container

Authorized Private Inspector	Department of Agriculture	Exporter of representatiive	Office of Commodity Standards	Board of Trade of Thailand	Inland Haulage

Packing List

Prepare goods for stuffing

Transfer a container to a warehouse

Registered MS. 13/1

Randomly not selected

Randomly selected

Collect sample

Monitor the inspection

Examine physical condition

Poor

Fine

Stuff a container

Unnecessary

Registered PO. 7

Necessary

Fumigate the cargo

Record fumigation method

Monitor the fumigation

Completed PO. 7

Certificate of Fumigation

Seal the cargo

Conduct laboratory examination

Completed MS. 13/1

Certificate of Analysis

Satisfactory

Request the issuance MS. 24/1

Issue MS. 24/1

Unsatisfactory

Collect MS. 24/1

Receive a copy of MS. 24/1

MS. 24/1

Transfer to port of departure

Customs	Exporter or Representative	Inland Haulage	Port Authority

Exporter or Representative:
- Prepare information for cargo movement
- Prepare Request for Port Entry (TKT. 308.2)
- Goods Transition Control List
- Submit TKT. 308.2 and pay entry fee
- Request for Port Entry (TKT. 308.2)
- Print out Goods Transition Control List
- Goods Transition Control List
- Ask for permission to enter port at Main Gate

Customs:
- Goods Transition Control List Reject
- Verify information
- Incorrect / Correct
- Goods Transition Control List Accept
- Receive EIR

Inland Haulage:
- Transfer cargo to port
- Take cargo to point of container inspection
- Take cargo to Sub-Gate

Port Authority:
- Record cargo/container information
- Acknowledge payment of entry fee
- Receipt
- Record date-time of port entry
- Measure weight of cargo/container
- Inspect container condition at time of gate in
- Specify a point in a terminal Where container will be placed
- Prepare EIR
- Equipment Interchange Receipt (EIR)
- Allocate equipment for cargo handling

Clear goods through customs (container)

Handle container and stow on vessel

Prepare documents required by importer

Verify the accuracy and authenticity of exported cargo

Pay

Activity diagram titled "Pay" with four swimlanes: Exporter or Representative, Exporter's Bank, Importer's Bank, Importer.

- Importer: Apply for L/C → (Proforma Invoice, Application for L/C)
- Importer's Bank: Verify submitted information → [Not Approved → back to Apply for L/C; Approved →] Issue L/C → L/C (Letter of Credit)
- Exporter's Bank: Call for the collection of L/C
- Exporter or Representative: Arrange the fee payment → Collect L/C → Prepare documents required during importation as listed in L/C → (Commercial Invoice, Packing List, Insurance Policy, Bill of Lading, Phytosanitary Certificate, Certificate of Origin, Other document required by L/C) → Request the payment of goods
- Exporter's Bank: Verify submitted documents → [Fail to meet conditions in L/C → Notify the decline for the payment of goods; Meet conditions in L/C →] Forward submitted documents
- Importer's Bank: Verify submitted documents → [Fail to meet conditions set in L/C → Importer Verify submitted documents; Meet conditions set in L/C →] Transfer the payment / Collect the payment
- Importer: Verify submitted documents → [Approved; Not Approved →] Make the payment → Collect documents required for import
- Importer's Bank: Decline the request to make payment of goods
- Exporter's Bank: Transfer the payment
- Exporter or Representative: Receive the payment

The Time-Procedure Chart
form the Business Process Analysis of Jasmine Rice Export from Thailand

1. Buy – Conclude sales contract and trade terms
2. Obtain export permit
3. Arrange transport
4. Arrange the inspection and fumigation
5. Obtain cargo insurance
6. Provide customs declaration
7. Collect empty container(s) from yard
8. Stuff container(s)
9. Transfer to port of departure
10. Clear goods through customs
11. Handle container at terminal and stow on vessel
12. Prepare documents required by importer
13. Verify the accuracy/authenticity of exported cargo
14. Pay – Claim payment of goods

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