2. INTRODUCTION TO THE BUSINESS PROCESS ANALYSIS

2A Definition and scope

A business process is a sequence of steps, with a beginning and an end, 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 the movement of cargo has to be escorted by corresponding cargo documents. The export of rice from some of the most trade-friendly countries in Asia, for example, may involve 15 different parties, 24 documents, and about 700 data elements.[3] According to ADB and UNESCAP (2009), no less than 22 days may be necessary for the exporter to comply with various procedures and have the shipment ready for export at the nearest seaport. 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 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 6 per cent if the products are time-sensitive (perishable) agricultural goods.[4]

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. 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;

[3] ADB and UNESCAP (2009). *Designing and Implementing Trade Facilitation in Asia and the Pacific*. Asian Development Bank. Manila.
[4] Djankov, S., Freund, C., and Pham, C. (2006). *Trading on Time*. World Bank. Washington DC.

- 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 as well as increase stakeholders' knowledge about the business processes. Additionally, it serves as a basis to identify areas for the optimization of business processes. It thus helps policy makers to redesign processes, make necessary modifications in an informed and targeted manner as well as justify those changes. The BPA provides also insights into how certain policies will improve operational efficiency, transparency, and effectiveness.

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 programs, 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 quality of a business process model depends not only on its ability to accurately represent various elements of a business process, but also on the appropriate use of graphical notations. The consistent use of modeling techniques produces results that can be easily understood, analysed, compared, and validated. If the ultimate goal of the business process modeling and analysis is to automate the international trade transaction and promote the electronic exchange of trade documents through the Single Window, 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.

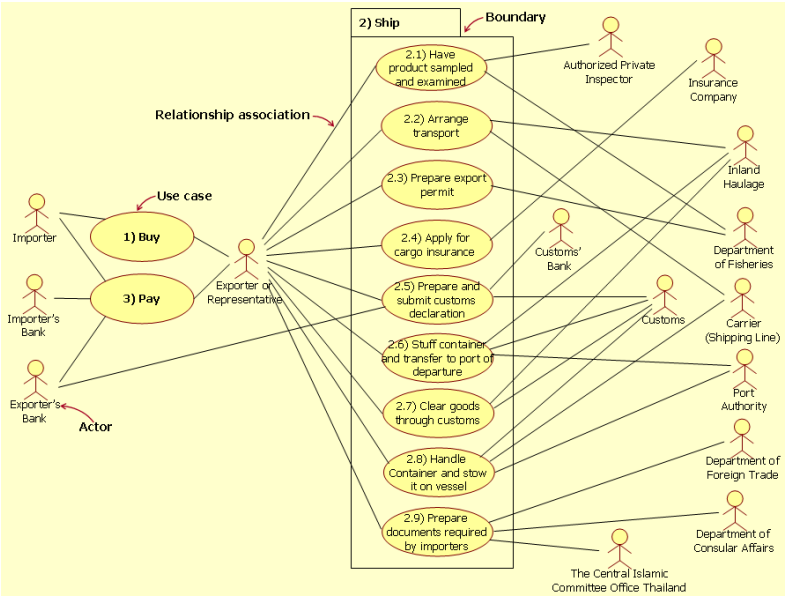
2C UML graphical notations used in this Guide

In business process analysis, the use case diagram, such as the one shown in Figure 2C-1, 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

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

involved in these business processes and demonstrates all actual associations between these business processes and the stakeholders.

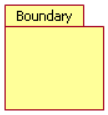
Figure 2C-1. Use Case Diagram



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

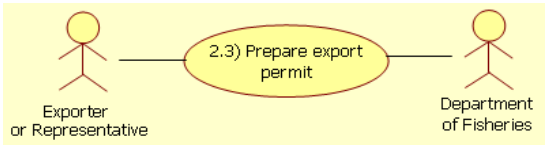
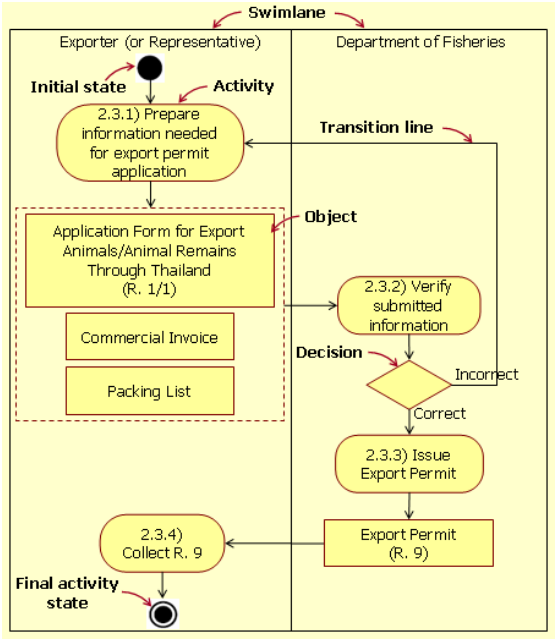
Various elements of a use case diagram include an actor, a use case, and a relationship association. The use of a boundary is optional. It can be useful as means to organize use cases. A set of graphical notations used in the use case diagram are provided with explanations of their meaning in Table 2C-1.

Table 2C-1. Use Case notations

Notation	Description and instruction for use
	Boundary: – Represents a process area – Includes the name of a subject boundary on top – E.g., ship
	Actor: – Represents a role that 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 – E.g., Exporter or Representative, Exporter's Bank
	Use Case: – Represents a core business process – Is labelled with a descriptive verb-noun phrase – E.g., buy, have product sampled and examined
	Relationship Association: – Links actors with the use cases (later business processes) they participate in

As illustrated in Figure 2C-2, 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.

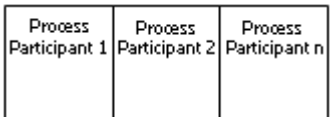
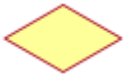
Figure 2C-2. An activity diagram explaining "2.3) prepare export permit" use case

<table>
<tr><th>UML Use Case Diagram</th><th>UML Activity Diagram</th></tr>
<tr><td> 
</td><td rowspan="2"> 
</td></tr>
<tr><td>UML Use Case Diagram and Activity Diagram are used to visualize the captured knowledge of the business processes. The use case diagram illustrates 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, describes activities, inputs, and outputs associated with each business process listed in the use case diagram.</td></tr>
</table>

A set of graphical notations for used in the activity diagram are provided with explanations of their meaning in Tables 2C-2. These notations are adopted from UML.

Table 2C-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

	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 – E.g., Exporter or Representative, Department of Fisheries
	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 – E.g., Prepare information needed for export permit application, Verify submitted information, Issue Export Permit, Collect R. 9
	Object – Represents a document or information that flows from one activity to another activity – Is labelled with a name of a document – E.g., Application Form for Export Animals/Animal Remains Through Thailand (R. 1/1), Commercial Invoice, Packing List, Export Permit (R. 9)
	Decision – Represented by a diamond – Refers to 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 – Label each transition line that comes out of ‘Decision’ with the condition, such as Correct, Incorrect
	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

2D Business process modeling tools

Business process modeling can be achieved through simple drawing tools such as paper and pencil, daily use office software (e.g., Microsoft Powerpoint, OpenOffice Impress, iWork Keynote), and basic diagramming software [6] (e.g., Microsoft Visio, OpenOffice Draw, SmartDraw).

Process analysts may consider using an off-the-shelf tool that has been designed specifically to facilitate not only the modeling of business process models, but also the management of business process model repository[7] (e.g. Enterprise Architect, MajicDraw, StarUML). The management of business process model repository includes activities such as:

- Establishing a business process model repository;
- Storing business process models and related process knowledge in the repository;
- Updating those business process models and process knowledge; and
- Managing any changes made and to be made to business process models and process knowledge.

The business process repository, that these off-the-shelf business process modeling tools help establish, serves as a central location for storing business process models and process knowledge. Via the tool, process analysts have an easy access to a repository that displays both business process models as a whole as well as individual elements that constitute business process models. The re-use of business models, their patterns, and their parts is therefore made easy. Nevertheless, it is important to bear in mind that process analysts may experience a high and steep learning curve before they can enjoy the benefits of rich business process modeling tools.

2E Outputs of the business process analysis

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

- A use case diagram showing the scope of the business process analysis project;
- A set of activity diagrams; each explains a core business process as represented by a use case in the use case diagram;
- A set of process descriptions; each provides a textual description of an activity diagram itself and related information including relevant laws, rules, and regulations, documentary requirements, input and criteria to enter/begin the business process, output and criteria to exit the business process, and indicate the average time required to complete them;
- A list of trade forms and documents which may be accompanied with samples of physical copies;
- An integrated activity diagram;
- A 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*.

[6] See http://en.wikipedia.org/wiki/Diagramming_software for an extended list.
[7] See http://en.wikipedia.org/wiki/List_of_Unified_Modeling_Language_tools for an extended list.