Business Process Analysis for Business Process Simplification and Automation

Workshop on Launch of the Implementation Master Plan for Mongolia’s Single Electronic Window
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Trade and Investment Division, ESCAP

The United Nations Network of Experts for Paperless Trade

UNNExT
United Nations Network of Experts for Paperless Trade in Asia and the Pacific

ESCAP
Economic and Social Commission for Asia and the Pacific

UNECE
United Nations Economic Commission for Europe
## BPA Training Overview

### Schedule and Activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>15th</td>
<td>14:00 ~ 15:00</td>
<td>- BPA Overview with Case Study</td>
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<tr>
<td></td>
<td>15:00 ~ 15:15</td>
<td>Coffee Break</td>
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<tr>
<td></td>
<td>15:15 ~ 16:30</td>
<td>- BPA Overview with Case Study (Cont’d)</td>
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<tr>
<td></td>
<td></td>
<td>- Group Formation</td>
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<tr>
<td>16th</td>
<td>09:30 ~ 10:30</td>
<td>- Practicum 1: Scope Setting &amp; Process Definition</td>
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<td>10:30 ~ 10:45</td>
<td>Coffee Break</td>
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<tr>
<td></td>
<td>10:45 ~ 12:00</td>
<td>- Practicum 2: Problem Analysis</td>
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<td></td>
<td>12:00 ~ 13:00</td>
<td>Lunch Break</td>
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<tr>
<td></td>
<td>13:00 ~ 14:30</td>
<td>- Practicum 3: Recommendation Development</td>
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<tr>
<td></td>
<td>14:30 ~ 14:45</td>
<td>Coffee Break</td>
</tr>
<tr>
<td></td>
<td>14:45 ~ 16:00</td>
<td>- Group Report and Conclusion</td>
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<td>- Evaluation and Follow-up Action Plan</td>
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Business Process Analysis for Business Process Simplification and Automation

Part 1
Introduction to Business Process Analysis and Business Process Modeling
International Trade Transaction

International trade is complex... a lot of time and money is spent on cumbersome paperwork.

- International trade transaction in average involves 27 to 30 different parties, 40 documents, 200 data elements (30 of which are repeated at least 30 times) and the re-keying of 60 to 70 percent of data at least once.¹

- Administrative hurdles from cumbersome procedural and documentary requirements can account for up to 75% delay of shipments. Each additional day of delay may reduce trade volume by at least 1% or approximately 7% if the products are agricultural commodity.²

- The costs of paperwork account for 3.5 – 7% of the value of the goods.³ It can be as high as 10 – 15% if there are typing and other error.⁴

¹ APEC (1996), APEC Means Business: Building Prosperity for our Community, APEC Secretariat, Singapore.
⁴ UNCTAD (1994) Fact Sheet 5, United Nations International Symposium on Trade Efficiency, Columbus.
# What is Trade Facilitation?

<table>
<thead>
<tr>
<th>Trade Facilitation</th>
<th>APEC</th>
<th>OECD</th>
<th>UN/CEFACT</th>
<th>UNECE</th>
<th>WB</th>
<th>WTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>The simplification and harmonization of trade procedures and formalities involved in collecting, presenting, communicating, and processing data required in the international trade</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The harmonization and standardization of information and information flows associated with the international trade transaction</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>The use, standardization, and improvement of physical infrastructure and facilities</td>
<td>✓</td>
<td></td>
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<td>✓</td>
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<tr>
<td>The harmonization of applicable laws and regulations with the international standards</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
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</table>
Trade Facilitation Measures and BPA

- Establishment of Single Window and Paperless Trading Environment
  - UN/CEFACT Recommendation No. 33
  - Manual for the Design of Aligned Trade Forms
    - UN Trade Document Toolkit
    - Draft APEC Handbook for Data Harmonization and Core-Component Based Electronic Message Development
  - UN/CEFACT Core-Component Library

- Document Simplification and Data Harmonization
- Business Process Simplification
  - UN/CEFACT Recommendation No. 18

- Business Process Analysis (BPA)
  - Guide to Business Process Analysis to Simplify Trade Procedures
Step Towards Paperless SW Environment

- Business Process analysis
- Process simplification and harmonization
- Documents simplification and alignment
- National data harmonization
- Cross-border data harmonization & exchange
- e-Single Window & paperless trading
Business Process Analysis (BPA)

What
- The close examination of an as-is business process and related information flow within one organization or across organizations in normal operation and in consequences where exceptions take place
  - A business process is a chain of logically connected activities to move goods and related information across borders from buyer to seller and to provide related services.

Purpose
- To understand the current processes and its attributes
  - Who involved,
  - Procedures and documents required,
  - Related rules and regulations, and
  - Some quantitative indicators (e.g. number of steps, time & costs needed)
Why

- To identify bottlenecks and redundancies in terms of procedural and documentary requirements
- To serve as an input for designing improvement strategies e.g.,
  - The design of a to-be business process that is simpler and free from previously identified inefficiencies
  - The harmonization of data requirements
  - The automation of business processes and information exchange

Benefits of business process analysis

- Understanding of the current situation
- Benchmarking with other countries
- Raising issues and priorities for improvement
- A stepping stone for the creation of future better processes, e.g. Process Simplification
Business Process Modeling

What
- A technique for documenting a business process and its attributes
  - 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
  - Relationships among actors
  - Information flow
  - Associated rules and regulations
  - Quantitative indicators such as number of steps as well as time and cost required to complete a particular business process

Why
- To establish a common understanding about a business process that is shared by all relevant parties
- To communicate better all aspects of a business process
UN/CEFACT Modeling Methodology (UMM)

- Provides a guideline for modeling inter-organizational business processes and data requirements
- Employs a top-down approach that describes in detail how process analysts should document knowledge about related process attributes

<table>
<thead>
<tr>
<th>UMM View</th>
<th>Description</th>
</tr>
</thead>
</table>
| Business Domain View     | □ Partition business domain into business areas, process areas, and business processes  
                          | □ Establish the business context of business process to be studied          |
| Business Requirement View| □ Capture business process attributes, their relationships, and information flow between participants who perform business activities in a business process |
| Business Transaction View | □ Elicit definition and characteristic of business information that flow in a business process |
| Business Service View    | □ Identify possible features of automated system and corresponding messages  |
Unified Modeling Language (UML)

- A set of standard graphical notations for documenting a business process and business requirements
  - Is widely recognized and used among practitioners in business community as well as those in IT and software industry
  - Allows business domain experts to communicate procedural and documentary requirements with IT implementation or software development team

UML Diagrams for BPA

Use Case Diagram
- A frame of reference illustrating a high level business process and its associated actors

Activity Diagram
- A detailed elaboration of a use case diagram
- A graphical representation of a business process and its attributes
  - 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
  - Relationships among actors
  - Information flow

Buy - Conclude sales contract and trade terms

Importor

Exporter or Representative

Quote price and term of trade

Not acceptable

Acceptable

Proforma Invoice

Cancel

Confirm the intent to purchase

Not acceptable

Acceptable

Prepare the shipment of goods

Purchase Order

Exporter or Representative

Importer

# UML Notations for Use Case Diagram

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Subject Boundary** | - Represents a process area  
- Includes the name of a subject boundary on top |
| **Actor/Role** | - Represents a role in a particular business process  
- Is labeled with a role name |
| **Use Case** | - Represents a business process  
- Is labeled with a descriptive verb-noun phrase |
| **Relationship Association** | - Link actors with business processes that they participate in |
Exercise – Read the Use Case Diagram

Thailand’s Export of Frozen Shrimp

1) Buy
   2.1) Have product sampled and examined
   2.2) Arrange transport
   2.3) Prepare export permit
   2.4) Apply for cargo insurance
   2.5) Prepare and submit customs declaration
   2.6) Stuff container and transfer to port of departure
   2.7) Clear goods through customs
   2.8) Handle Container and stow it on vessel
   2.9) Prepare documents required by importers
   3) Pay

Roles:
- Exporter or Representative
- Importer
- Exporter’s Bank
- Importer’s Bank
- Customs Department of Foreign Trade
- The Central Islamic Committee Office Thailand
- Department of Consular Affairs
- Port Authority
- Customs’ Bank
- Insurance Company
- Inland Haulage
- Port
- Carrier (Shipping Line)
- Department of Fisheries
- Authorized Private Inspector
- Department of Consular Affairs
- Department of Foreign Trade
- Customs
# UML Notations for Activity Diagram

<table>
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<th>Notation</th>
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<tbody>
<tr>
<td>Initial State</td>
<td>Represents the beginning of a set of activities</td>
</tr>
<tr>
<td>Final Activity State</td>
<td>Indicates the completion of the business process</td>
</tr>
<tr>
<td>Final Flow State</td>
<td>Indicates that further activities cannot be pursued</td>
</tr>
<tr>
<td>Transition Line</td>
<td>Indicates a sequential flow of actions and information in an activity diagram</td>
</tr>
<tr>
<td>Fork (Splitting of Control)</td>
<td>Visualizes a set of parallel or concurrent flow of actions</td>
</tr>
<tr>
<td>Join (Synchronization of Control)</td>
<td>Indicates the end of parallel or concurrent flow of activities</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Notation</th>
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<td>Swimlane</td>
<td>Is used to break up individual actions to individuals/ agencies that are responsible for executing their actions</td>
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<tr>
<td>Activity</td>
<td>Represents a non-decomposable piece of behavior</td>
</tr>
<tr>
<td>Decision</td>
<td>Represents the point where a decision has to be made given specific conditions</td>
</tr>
</tbody>
</table>

Swimlane:
- Is used to break up individual actions to individuals/ agencies that are responsible for executing their actions
- Is labeled with the name of the responsible individual or agency

Activity:
- Represents a non-decomposable piece of behavior
- Is labeled with a name that 1) begins with a verb and ends with a noun; and 2) is short yet contain enough information for readers to comprehend

Decision:
- Represents the point where a decision has to be made given specific conditions
- 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
1) Buy

2) Ship
   - 2.1) Have product sampled and examined
   - 2.2) Arrange transport
   - 2.3) Prepare export permit
   - 2.4) Apply for cargo insurance
   - 2.5) Prepare and submit customs declaration
   - 2.6) Stuff container and transfer to port of departure
   - 2.7) Clear goods through customs
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3) Pay

Exporter or Representative

Exporter’s Bank

Importor’s Bank

Authorized Private Inspector

Insurance Company

Inland Haulage

Department of Consular Affairs

The Central Islamic Committee Office Thailand

Customs

Carrier (Shipping Line)

Port Authority

Department of Foreign Trade

Department of Fisheries

Exporter or Representative

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Exporter’s Bank

Authorized Private Inspector

Insurance Company

Inland Haulage

Department of Consular Affairs

The Central Islamic Committee Office Thailand

Customs

Carrier (Shipping Line)

Port Authority

Department of Foreign Trade

Department of Fisheries
2.1) Have product sampled and examined

Authorized Private Inspector

Exporter (or Representative)

Department of Fisheries

- Submit Request for Sampling
- Schedule the sampling date
- Collect sample
- Deliver sample
- Request for Sampling
- Collect sample
- Collect Test Report
- Examine sample
- Record sampling result
- Examine sample
- Record result of examination
- Test Report

- Have product ready for sampling
- Notify the date for sample collection
- Collect sample
- Deliver sample
- Examine sample
- Record the result of examination
- Test Report

- Collect Test Report
- Record result of examination
- Test Report
# Stakeholders in BPA

## Role

**Project Sponsor**
- Finalize and approve the project scope
- Approve 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 information to define project scope
- Develop a detailed plan
- Organize resources
- Oversee and control the execution of the plan
- Participate in the review of milestone deliverables and the final outputs

**Process Analysts**
- Review plan and propose adjustment if needed
- Conduct desk research
- Prepare questions for the interview
- Conduct the interviews
- Collect and consolidate data
- Document the as-is processes
- Analyze and identify bottlenecks and opportunity for improvement
- Develop recommendations
- Report the final outputs

**Process Participants/Business Domain Experts**
- Verify the proposed project scope
- Provide relevant knowledge about business processes under investigation
- Verify the accuracy of deliverables
- Participate in the review of the final output

## Phase I
- **Step 1:** Define project scope

## Phase II
- **Step 2:** Develop a detailed plan and secure resources
- **Step 3:** Acquire background information

## Phase III
- **Step 4:** Conduct interview and document captured data
- **Step 5:** Analyze the “as-is” processes and identify bottlenecks
- **Step 6:** Develop and propose recommendations
Skills of Process Analysts

- **Technology skills:** The 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 under investigation. It is also very useful if they have knowledge of a particular organization or industry associated with the targeted business domain.

- **Interpersonal/communication skills:** Process analysts’ ability to effectively communicate and interact with other project members is mostly 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:** Process analysts should be able to capture relevant information from verbal expression and written documents, and then formalize them in various types of BPA output.
# Outputs of BPA

<table>
<thead>
<tr>
<th>Step</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Define project scope</strong></td>
<td>□ Use case diagram illustrating business domain, process areas, process participants, and key business processes</td>
</tr>
</tbody>
</table>
| **Step 2: Develop a detailed plan and secure resources** | □ Detailed project plan including an estimation of human resources required, schedules, and software supported tools  
□ A list of potential interviewees and their contact information |
| **Step 3: Acquire background information** | □ A folder of background information about the business processes under the investigation  
□ A list of guiding questions for the interview |
| **Step 4: Conduct interview and document captured data** | □ A set of activity diagrams illustrating 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, relationships among actors, and information flow  
□ A set of business process descriptions that describes activity diagram and lists all related rules and regulations  
□ Activity diagram illustrating integrated processes in the business domain  
□ Time-Procedure chart displaying time required to complete each business process |
| **Step 5: Analyze the “as-is” processes and identify bottlenecks** | □ A set of observations of the as-is business processes that have the potential for improvement |
| **Step 6: Develop and propose recommendations** | □ Final report with recommendations which may include diagrams of “to-be” business processes |
Step-by-Step Approach to BPA

1) Define a project scope
2) Develop a detailed plan and secure resources
3) Acquire background information
4) Conduct interviews and document captured data
5) Analyze the “as-is” process and identify bottlenecks
6) Develop and propose recommendations
BPA Activities in a Nutshell

1. **Scope setting** – Specify a scope of processes to be analyzed
   - e.g. import and/or export processes of a specified product, through a certain mode of transportation (trucks, trains, ships or airplanes)

2. **Process definition** – Define and document a sequence of steps in actual practices and their attributes
   - *Who involved (stakeholders/actors)*
   - *Procedures and documents required (input to/output from),*
   - *Related rules and regulations*

3. **Problem analysis** – Develop measurable and quantitative process indicator (*e.g. the number of steps, time and costs required to fulfill those processes*), locate bottlenecks and examine what causes them

4. **Recommendation development** – Determine how to eliminate each bottleneck and prioritize improvement actions
Recommendations in Implementing BPA

- Get Buy-in from the officials
- Secure Adequate resources
- Clear Roles and responsibilities of the project stakeholders
- Choose a Champion
- Start Small, and then Evolve
- Profit from experience
- Invest in Training
- Performance measurement
Thank you

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