Session 6.1 - Business Process Analysis (BPA) to Simplify Trade Procedures: Introduction

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BPA On-line Learning (also with Certification) is available.

E-Learning Series on Business Process Analysis for Trade Facilitation

The Business Process Analysis (BPA) online training course has been developed by the ESCAP Trade, Investment and Innovation Division based on the UNNExT BPA Guide to Simplify Trade Procedures. BPA is considered the first necessary step to simplifying trade procedures. The course consists of seven modules and introduces a step-by-step approach to conducting BPA. It is aimed at government officials and other stakeholders responsible for trade facilitation. This course is also available in Russian.

The course is divided as follows:

- Module 1: BPA for Trade Facilitation - An Introduction
- Module 2: Unified Modeling Language
- Module 3: Project and Scope Setting
- Module 4: Project Planning
- Module 5: Data Collection and Process Documentation
- Module 6: Process Analysis and Recommendations Development
- Module 7: From BPA to Trade and Transport Facilitation Monitoring Mechanism

For guidance on how to study this course download the Study Guide. The online course also includes the possibility of obtaining a BPA for Trade Facilitation certificate.

For more information, please contact: escap-tiid@un.org
Agenda

1. BPA for Analyzing and Proposing Trade Facilitation Improvement Recommendations

2. Introduction to Unified Modeling Language (UML), i.e. two types of Diagrams (Use-Case Diagrams & Activity Diagrams), and Time-Procedure Chart

3. The Three (3) Phases of a BPA Project

4. Example: A BPA Project as an input for formulating a national logistics development plan
What is a Business Process?

A Business Process is a collection of related and structured activities or tasks that produce a specific service or product.

Example

- Applying and Issuing procedures of Phyto-Sanitary Certificates, e.g. for exporting agriculture goods from Bangladesh
- Export procedures of garments from Dhaka, through port & customs clearance at Chittagong Port (to the 3rd Country)
- Import Customs clearance procedures at Banglabandha border
- Import procedures and documentation of Lentils from Nepal, through Kakarvitta-Panitanki-Fulbari-Banglabandha borders, until the cargo arriving at Dhaka, Bangladesh.
What is a Business Process Analysis (BPA)?

An analysis and modelling of business processes for capturing/monitoring “as-is” (current) conditions and proposing “to-be” (target) improvement.

- For example, it may include......
  - Documenting existing practices in an administration/company
  - Describing a “Standard Procedure,” e.g. some common cases
  - Identifying related quantitative indicators, e.g. number of steps
  - Collecting information about time and costs at different steps
  - Providing a specification for simplification or automation of the process (to be implemented in the future)
Documents related to Exportation of Rice
(from purchase order until the cargo container leaving a sea port)

36 Documents involving 15 parties, and more than 1,140 data elements to be filled in

1. Proforma Invoice (35)
2. Purchase Order (39)
3. Commercial Invoice (51)
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 (25)
11. Booking Confirmation – Border Crossing (30)
12. Booking Request Form – Inland Transport (16)
13. Booking Confirmation – Inland Transport (18)
14. Bill of Lading (42)
15. Empty Container Movement Request (TKT 305) (20)
16. Request for Port Entry (TKT 308.2) (27)
17. Equipment Interchange Report (EIR) (24)
18. Container Loading List (28)
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 (114)
24. Good Transition Control List (27)
25. Application for Permission to Export Rice (KP. 2) (24)
26. Sales Report (KP 3) (21)
27. Application for the Collection of the Permit for the Export of Rice (A. 3) (35)
28. Permit for the Export of Rice (A. 4) (35)
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. 9) (29)
34. Phytosanitary Certificate (33)
35. Application for Certificate of Origin (42)
36. Certificate of Origin (38)

* Number in parenthesis is the no. of data elements
A Business Process Analysis
- in Exporting Jasmine Rice from Thailand -

16 days are required for these procedures and documents transaction

Time-Procedure Chart

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
Trade Facilitation

is about
Increasing
National Trade Competitiveness
by improving
Import/Export/Transit Procedures and Documents Handlings
among
Government Agencies,
Business Entities and
Transport/Logistics Service Providers
What is a Supply Chain?

A supply chain is a system of organizations, people, technology, activities, information and resources involved in moving a product or service from seller to buyer.

<table>
<thead>
<tr>
<th>Commercial Procedures</th>
<th>Transport Procedures</th>
<th>Regulatory Procedures</th>
<th>Financial Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Establish contract</td>
<td>• Establish transport contract</td>
<td>• Obtain export/import licences, etc.</td>
<td>• Provide credit rating</td>
</tr>
<tr>
<td>• Order goods</td>
<td>• Collect, transport and deliver goods</td>
<td>• Provide customs declaration</td>
<td>• Provide insurance</td>
</tr>
<tr>
<td>• Advise on delivery</td>
<td>• Provide waybill, gods receipt and status reports</td>
<td>• Provide cargo declaration</td>
<td>• Provide credit</td>
</tr>
<tr>
<td>• Request payment</td>
<td></td>
<td>• Apply trade security procedures</td>
<td>• Execute payment</td>
</tr>
</tbody>
</table>

Buy-Ship-Pay Model
Why we should conduct a Business Process Analysis?

Business Process Analysis is a practical study
- to understand attributes of business processes, and their relationships

- Who involved
- Procedures and Documents required
- Some quantitative indicators
- Related Rules and Regulations
What are the 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
Why trading across borders in some countries are more difficult, time consuming and expensive?

- Procedures and documents handling remain largely paper dependent.
- Missing and incorrect documentation slows progress through the supply chain.
- Keeping documents & freight in sync is complex and costly.
- Multiple parties capturing the same data is inefficient and error prone.

We acknowledge other factors that makes trade in developing countries more difficult, including infrastructure, corruption, land locked, … (but these are not the main scope of discussion in this workshop.)
BPA to understand the current trade processes, and then propose improvement.

- BPA is the first technical step in preparing for trade facilitation measures including process simplification and automation.

- It provides
  - Inventory of processes, documents, data, parties, rules & regulations
  - Description of the processes
  - Specifications for harmonizing data and development of electronic documents
  - Specifications to develop software for the automation of procedures
  - Business Models for the operation of Single Window environment
  - A basis for maintenance and improvement
Economic impacts of the bottlenecks due to trade/transport facilitation processes & documentation

- Each additional day of delay (e.g. because of trade/transport procedures) reduces trade by at least 1%.


- “Direct and Indirect Cost from import/export-related procedures and required documents is about 1-15% of product cost.”

Agenda

1. BPA for Analyzing and Proposing Trade Facilitation Improvement Recommendations

2. Introduction to Unified Modeling Language (UML)

3. The Three (3) Phases of a BPA Project

4. Example: A BPA Project for a national logistics development plan
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
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 (What)**
- A frame of reference illustrating a high level business process and its associated actors

**Activity Diagram (How)**
- 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
# UML Notations for Use Case Diagram

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Actor" /></td>
<td>Actor&lt;br&gt;- Represents a role in a particular business process&lt;br&gt;- Is labeled with a role name</td>
</tr>
<tr>
<td><img src="image" alt="Use case" /></td>
<td>Use Case&lt;br&gt;- Represents a business process&lt;br&gt;- Is labeled with a descriptive verb phrase</td>
</tr>
<tr>
<td><img src="image" alt="Boundary" /></td>
<td>Relationship Association&lt;br&gt;- Link actors with business processes that they participate in</td>
</tr>
<tr>
<td><img src="image" alt="Boundary" /></td>
<td>Subject Boundary&lt;br&gt;- Represents a process area&lt;br&gt;- Includes the name of a subject boundary on top</td>
</tr>
</tbody>
</table>
Exercise – Read the Use Case Diagram

Thailand’s Export of Frozen Shrimp

1) Buy
   - 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
     - 2.8) Handle Container and stow it on vessel
     - 2.9) Prepare documents required by importers
   - 3) Pay
     - Exporter or Representative
     - Exporter's Bank
     - Importer's Bank
     - Importer

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# UML Notations for Activity Diagram

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Initial State" /></td>
<td>Represents the beginning of a set of activities</td>
</tr>
<tr>
<td><img src="image" alt="Final Activity State" /></td>
<td>Indicates the completion of the business process</td>
</tr>
<tr>
<td><img src="image" alt="Final Flow State" /></td>
<td>Indicates that further activities cannot be pursued</td>
</tr>
<tr>
<td><img src="image" alt="Transition Line" /></td>
<td>Indicates a sequential flow of actions and information in an activity diagram</td>
</tr>
<tr>
<td><img src="image" alt="Fork (Splitting of Control)" /></td>
<td>Visualizes a set of parallel or concurrent flow of actions</td>
</tr>
<tr>
<td><img src="image" alt="Join (Synchronization of Control)" /></td>
<td>Indicates the end of parallel or concurrent flow of activities</td>
</tr>
<tr>
<td><img src="image" alt="Object" /></td>
<td>Represents a document or information that flows from one activity to another activity (labeled with the name of a document)</td>
</tr>
</tbody>
</table>

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<th>Notation</th>
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<td><img src="image" alt="Swimlane" /></td>
<td>Is used to break up individual actions to individuals/agencies that are responsible for executing their actions</td>
</tr>
<tr>
<td><img src="image" alt="Activity" /></td>
<td>Represents a non-decomposable piece of behavior</td>
</tr>
<tr>
<td><img src="image" alt="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. It is labeled with the name of the responsible individual or agency.
- **Activity**: Represents a non-decomposable piece of behavior. It 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.
Exercise – Read the Activity Diagram

2.1) Have product sampled and examined

Authorized Private Inspector

Exportor or Representative

Department of Fisheries (DoF)

Authorized Private Inspector

Exporter (or Representative)

Department of Fisheries (DoF)

- Have product ready for sampling
- Schedule the sampling date
- Notify the date for sample collection

- Additional examination not required
- Additional examination required

- Test Report
- Collect Test Report
- Test Report

- Collect sample
- Deliver sample
- Request for Sampling
- Collect sample
- Record sampling result
- Examine sample
- Record result of examination
- Test Report

- Examine sample
- Record the result of examination

- Collect Test Report

- Record result of examination
Using UML Modeling Tool for BPA
Agenda

1. BPA for Analyzing and Proposing Trade Facilitation Improvement Recommendations

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3. The Three (3) Phases of a BPA Project

4. Example: A BPA Project for a national logistics development plan
BPA: Three (3) Phases

I. **Scope setting/Planning** – 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)

II. **Data collection and process documentation** – 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 regulation

III. **Process analysis** – Locate bottlenecks, examine what causes them, and develop measurable and quantitative process indicators (e.g. the number of steps, time and costs required to fulfill those processes)

**Recommendation development** – Determine how to eliminate each bottleneck and prioritize improvement actions
Three(3) Phases of a BPA Project

Phase I
1) Define a project scope
2) Develop a detailed plan and secure resources

Phase II
3) Acquire background information
4) Conduct interviews and document captured data

Phase III
5) Analyze the “as-is” process and identify bottlenecks
6) Develop and propose recommendations
## Outputs of BPA

<table>
<thead>
<tr>
<th>Step</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I</strong></td>
<td></td>
</tr>
<tr>
<td>Step 1: Define project scope</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 |
| **Phase II** | |
| 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 |
| **Phase III** | |
| 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 |
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3. The Three (3) Phases of a BPA Project
4. Example: A BPA Project for a national logistics development plan
Phase I: Scope Setting

Example:
- Regulatory and business requirements related to the operation and management of port before, upon, and after the import and export of containerized ordinary cargoes through all modes of transportations (road, rail, air, and sea)
  - Carrier scheduling for port use
  - Cargo handling

- Import
  - Starting point: when a carrier enters port
  - Ending point: when cargo is picked up and transferred to an importer

- Export
  - Starting point: when cargo arrives port
  - Ending point: when cargo is on board and ready to be transferred to the country of importer

Site Visited:
- No. of Interviews = 45
- Phone & email interviews
  - No. of Interviews = 16

Ports:
- Airport (Chiangmai)
- Sea Port (Chiangsan)
- Dry Port (Maesai)
- Dry Port (Mukdahan)
- Dry Port (Nongkai)
- ICD (Ladkrabang)
- Suvannabhumi Airport
- Sea Port (Unithai)
- Etc.
- Sea Port (Lamchabang)
- Train Station
- Dry Port

- Site Visited
  - No. of Interviews = 45
- Phone & email interviews
  - No. of Interviews = 16
Phase I: Scope Setting
Example: Importation by Sea

Draw a **use case diagram** to illustrate the business domain with process areas and high-level business processes as well as stakeholders associated with each of them.

**Example:** Capturing the Stakeholders involved in importation by sea

- Vessel Agent
- Maritime Pilot’s Station
- Marine Department
- Port Operator
- Customs
- Other Government Agencies
- Importer or Representative
- Terminal Operator
- Haulage/Truck

Business Processes

- Prepare documents for import
- Prepare to enter a seaport
- Report cargo manifest
- Enter a seaport
- Unload cargo
- Clear goods through customs
- Arrange the transport for the pick-up of goods
- Handle cargo at the terminal
- Pay for goods

Actors:
- Vessel Agent
- Maritime Pilot’s Station
- Marine Department
- Port Operator
- Customs
- Other Government Agencies
- Importer or Representative
- Terminal Operator
- Haulage/Truck
- Bank
Phase II: Data Collection and Process Documentation

Example: Prepare to Enter a Seaport Process

For each process, draw an activity diagram that describes activities and associated documentary requirements.

Vessel Agent
- Prepare documents
  - Application for Vessel Entering Port Area
    - Request for Maritime Pilotage
      - General Declaration
      - Receive
        - Assign pilot officer
        - Receive
          - Prepare the allocation of equipments
      - Receive
    - Receive
  - Receive
  - Receive

Marine Department
- Receive
- Receive

Maritime Pilot’s Station
- Receive
- Receive

Port Operator
Phase II: Data Collection and Process Documentation

Example: Activity Diagram of Prepare to Enter a Seaport Process

- **Swimlane** shows a boundary of activities to be carried out by a responsible actor.

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**Initial State** shows the starting point for the sequence of activities.

- Prepare documents
- Application for Vessel Entering Port Area
- Request for Maritime Pilotage
- General Declaration

- Document associated with each action

- Receive
- Receive
- Receive
- Assign pilot officer
- Prepare the allocation of equipments

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**Final State** shows where the sequence of activities reaches its end.
Phase III-1: Process Analysis

Example: Prepare to Enter a Seaport Process (Existing Process)

Problems:
- Duplicated Information
- High Cost and Time for sending and receiving documents
- Data Inconsistency
Phase III-2: Recommendation Development

Example: Prepare to Enter a Seaport Process

Proposed Recommendations:
- Remove unnecessary data requirements
- Harmonize and standardize data requirements
- Automate “prepare to enter a seaport” process
Phase III-2: Recommendation Development
Example: Prepare to Enter a Seaport Process (Proposed New Process)

**Stakeholders:**
1) Vessel
2) Value Added Service
3) NSW Exchange
4) Marine Dept.
5) Port Operator
6) Maritime Pilot’s Station

Vessel Agents send electronic documents to Marine Dept through NSW Exchange.

*Note: The diagram illustrates the process flow and stakeholders involved in the proposed new process.*
Phase III-2: Recommendation Development

Example: Time – Procedure Chart of Importation by Sea

9 Main processes
1. Prepare documents for import
2. Prepare to enter a seaport (Vessel)
3. Enter a seaport (Vessel)
4. Report cargo manifest
5. Unload cargo
6. Clear goods through customs
7. Arrange the transport for the pick-up of goods
8. Handle cargo at the terminal
9. Pay for goods
Summary of a study: **Usage Time for Import**

<table>
<thead>
<tr>
<th>Transport Mode</th>
<th>As-Is Usage Time (day)</th>
<th>To-Be Usage Time (day)</th>
<th>Expected Reduced Time (day)</th>
<th>Expected Reduced Time (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import by Ship</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>40.00</td>
</tr>
<tr>
<td>Import by Airplane</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td>20.00</td>
</tr>
<tr>
<td>Import by Truck</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>30.00</td>
</tr>
<tr>
<td>Import by Train</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>18.18</td>
</tr>
</tbody>
</table>

**Criteria (following UN/CEFACT Recommendation No 18, and other)**
- Reduce time for Traveling, Sending and Receiving Documents by humans
- Reduce time for Preparing Documents for next step
- Reduce time for Making Payment
- Reduce time for Searching Information
- Reduce time for Verifying Information
Lessons learned from 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
Conclusions

1. BPA is a very simple but powerful methodology to capture/monitor the “as-is” conditions, and to propose “to-be” processes and documentation requirements for trade and transport facilitation improvement.

2. **UML Diagrams**: Use Case Diagrams & Activity Diagrams, and also Time-Procedures Chart are introduced.

3. **Three (3) Phases of a BPA Project** is recommended. (1. scoping/planning, 2. capturing/modelling the as-is, and 3. analyzing/proposing recommendations for improvement)

4. **A BPA Project Example** is briefly discussed.
Exercise: Try to explain the meaning of the following Use Case Diagram and An Activity Diagram
A Use Case Diagram:

Showing main procedures for exporting Rice from Thailand (through a sea port)
An Activity Diagram:

Showing detailed procedures and document requirements for obtaining a Rice Export Permit

Obtain export permit

- Exporter or Representative
  - Prepare documents for the application of export permit
  - Application for Permission to Export Rice (KP. 2)
  - Sales Report (KP 3)
  - Application for the Collection of the Permit for the Export of Rice (A. 3)
  - Draft Permit for the Export of Rice (A. 4)
  - Evidence of Sales (Purchase Order or Sales Contract)

- Department of Foreign Trade
  - Verify submitted information
    - Incorrect
    - Correct
  - Sign and authenticate A. 4
  - Collect A. 4
    - Permit for the Export of Rice (A. 4)