Module 2-6
Business Process Analysis (BPA)

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Three (3) Objectives of the BPA Modules (Day 1 & 2: Module 2-6)

The participants will learn:

1. **What is Business Process Analysis (BPA):** A methodology for
   - Capturing/monitoring “As-Is” (current) processes and documentation requirements related to trade and transport facilitation, and
   - Proposing “To-Be” (target) improvement, e.g. with process simplification, document harmonization, and automation including Single Window implementation;

2. **How to describe** these processes and documentation with graphical notations (diagrams) and associated descriptions based on a standardized/Unified Modelling Language (UML);

3. **How to conduct** a business process analysis and to propose recommendations for improvement (managing it as a Project).
Module 2
Introduction to Business Process Analysis

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Agenda

1. BPA for Monitoring and Proposing Improvement of Trade and Transport Facilitation

2. Introduction into Unified Modeling Language (UML)

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

4. Example: A BPA Project for 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 for a Phyto-Sanitary Certificate, e.g. for exporting agriculture goods from Nepal
- Export Procedures of carpets from Nepal
- Import Procedures and Documentation in Calcutta port for clearing and forwarding of Nepal bound cargo
- Import Procedures and Documentation starting from Calcutta port, through the Indo-Nepal border, until the cargo arriving at Kathmandu.
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)
Trade & Transport Facilitation – capturing/monitoring/improving at least 3 Kinds of Flow

- Seller (Exporter)
- Physical Goods
  - Buyer (Importer)
- Payment
- Information/Documents

- Traders
- Freight Forwarders
- Ship Agent
- Inspectors
- Terminal-Operator
- Warehouses
- Freight
- Payment
- Information/Documents

- Exporters
- Banks
- Customs Office
- Transport (Truck)-Operators
- Carriers
- Inspectors
- Warehouses
- Many other government agencies

Ministry of Trade
Chamber of Commerce and Industry
Dept of Agriculture
Dept of Commerce
Cargo Insurance
Customs-Brokers
Importers
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
The issue is about

Increasing
National Trade Competitiveness

by improving
Import/Export Procedures and Documents Handlings
among Government Agencies,
Business Entities and
Transport/Logistics Service Providers

(this is called “Trade/Transport Facilitation” improvement)
Indicators can help decision makers to understand the importance of import/export procedures related to national trade competitiveness.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>India</th>
<th>Nepal</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documents to export (number)</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Time to export (days)</td>
<td>25</td>
<td>38</td>
<td>16</td>
<td>42</td>
<td>14</td>
</tr>
<tr>
<td>Cost to export (US$ per container)</td>
<td>1,075</td>
<td>2,230</td>
<td>1,170</td>
<td>2,295</td>
<td>595</td>
</tr>
</tbody>
</table>


Comparing among 188 countries, the costs and procedures involved in exporting (and importing) a standardized shipment of goods are studied. Every official procedure involved is recorded – starting from the final contractual agreement between the two parties, and ending with the delivery of the goods.
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, goods 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>
<tr>
<td></td>
<td></td>
<td>Clear goods for import/export</td>
<td>Issue statements</td>
</tr>
</tbody>
</table>
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

Related Rules and Regulations

Some quantitative indicators
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.”

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2. Introduction into 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/Role" /></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="Relationship Association" /></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

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

- Importer
- Importer’s Bank
- Exporter’s Bank
- Exporter or Representative
- Authorized Private Inspector
- Insurance Company
- Inland Haulage
- Department of Fishery (DOF)
- Customs
- Customs’ Bank
- Carrier (Shipping Line)
- Port Authority
- Department of Foreign Trade
- Department of Consular Affairs
- The Central Islamic Committee Office Thailand
# 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>Initial State</td>
</tr>
<tr>
<td><img src="image" alt="Final Activity State" /></td>
<td>Final Activity State</td>
</tr>
<tr>
<td><img src="image" alt="Final Flow State" /></td>
<td>Final Flow State</td>
</tr>
<tr>
<td><img src="image" alt="Transition Line" /></td>
<td>Transition Line</td>
</tr>
<tr>
<td><img src="image" alt="Fork (Splitting of Control)" /></td>
<td>Fork (Splitting of Control)</td>
</tr>
<tr>
<td><img src="image" alt="Join (Synchronization of Control)" /></td>
<td>Join (Synchronization of Control)</td>
</tr>
<tr>
<td><img src="image" alt="Object" /></td>
<td>Object</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Swimlane" /></td>
<td>Swimlane</td>
</tr>
<tr>
<td><img src="image" alt="Activity" /></td>
<td>Activity</td>
</tr>
<tr>
<td><img src="image" alt="Decision" /></td>
<td>Decision</td>
</tr>
</tbody>
</table>

- **Swimlane**:
  - Represents the beginning of a set of activities.
- **Final Activity State**: Indicates the completion of the business process.
- **Final Flow State**: Indicates that further activities cannot be pursued.
- **Transition Line**: Indicates a sequential flow of actions and information in an activity diagram.
- **Fork (Splitting of Control)**: Visualizes a set of parallel or concurrent flow of actions.
- **Join (Synchronization of Control)**: Indicates the end of parallel or concurrent flow of activities.
- **Object**: Represents a document or information that flows from one activity to another activity (labeled with the name of a document).
- **Swimlane**: Is used to break up individual actions to individuals/agencies that are responsible for executing their actions.
- **Activity**: Represents a non-decomposable piece of behavior.
- **Decision**: Represents the point where a decision has to be made given specific conditions.

*Training Workshop on TTFMM, Nepal, 15-17 April 2014*
Exercise – Read the Activity Diagram

2.1) Have product sampled and examined

Exporter or Representative

Authorized Inspector

Department of Fisheries (DoF)

Authorized Private Inspector

Exporter (or Representative)

Have product ready for sampling

Schedule the sampling date

Submit Request for Sampling

Collect sample

Request for Sampling

Notify the date for sample collection

Collect sample

Record sampling result

Examine sample

Record result of examination

Test Report

Collect Test Report

Collect Test Report

Collect Test Report

Test Report

Additional examination not required

Additional examination required

Examine sample

Record the result of examination

Test Report

Collect sample

Deliver sample

Record result of examination

Notify the date for sample collection

Collect sample

Record result of examination

Test Report

Notify the date for sample collection

Collect sample

Record result of examination

Test Report
Using UML Modeling Tool for BPA
Agenda

1. BPA for Monitoring and Proposing Improvement of Trade and Transport Facilitation

2. Introduction into Unified Modeling Language (UML)

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

Project Sponsor

Project Manager/Project Leader

Process Analysts

Process Participants/Business Domain Experts
## 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 |
Agenda

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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

Box:

- 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

Training Workshop on TTFMM, Nepal, 15-17 April 2014
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
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.
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.

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

**Document associated with each action**

**Final State** shows where the sequence of activities reaches its end.

**Sequence of actions carried out to achieve a specific goal**

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

- **Marine Department**
  - Receive

- **Maritime Pilot's Station**
  - Receive
  - Assign pilot officer

- **Port Operator**
  - Receive
  - Prepare the allocation of equipments
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
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

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## 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**

1. Prepare documents for the application of export permit

**Department of Foreign Trade**

2. Verify submitted information

   - Correct
   - Incorrect

3. Sign and authenticate A. 4

4. Permit for the Export of Rice (A. 4)

5. Collect A. 4

6. Draft Permit for the Export of Rice (A. 4)

7. Sales Report (KP 3)

8. Application for the Collection of the Permit for the Export of Rice (A. 3)

9. Application for Permission to Export Rice (KP 2)

10. Evidence of Sales (Purchase Order or Sales Contract)