BUILDING A PROCESS FLOW MODEL

Group Meeting Method

EXAMPLE: HAMBURGER BUILD PROCESS

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EIGHT STEP METHODOLOGY

- Define scenario;
- Identify and define appropriate activities;
- Arrange activities in phased sequence;
- Identify and define input and output objects;
- Determine object life cycle states;
- Determine decision points and flow junctions;
- Identify and define activity controls and mechanisms; and
- Define notifications and messages.

PROCESS FLOW MODEL

MODEL BUILDING METHODOLOGY

• STEP ONE: DEFINE SCENARIO
  - HELP THE CUSTOMER DEVELOP AND
  DESCRIBE THE PROCESS AND VIEWPOINT BEING
  REPRESENTED AS WELL AS THE DECOMPOSITION
  LEVEL DESIRED

• GUIDELINES
  - DEFINE PROCESS BEING MODELED
  - DEVELOP A SCOPE STATEMENT
  - DEVELOP A TOP LEVEL PROCESS MODEL
    (ONE ACTIVITY BLOCK)
  - DESCRIBE OBJECT FLOW & CHANGE OF STATE

PROCESS MODEL INFORMATION

SCOPE: DESCRIBE THE HAMBURGER BUILD PROCESS
TO THE DEGREE NECESSARY TO DEFINE THE
FLOW AND STATE OF OBJECTS.

MODLER PROFILE

<table>
<thead>
<tr>
<th>Name</th>
<th>Team</th>
<th>OA</th>
<th>M/S</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ronald McDonald</td>
<td>Big Mac Team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wenfy Thomas</td>
<td>Single Team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>King Burger</td>
<td>Whopper Team</td>
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</tbody>
</table>
HAMBURGER BUILD PROCESS

DESCRIPTION OF THE OBJECTS THAT FLOW THROUGH THE PROCESS AND HOW THEY CHANGE STATE

Hamburgers change state from being raw to being cooked, delivered and accepted by the customer. Hamburger buns start out by being wrapped together in a bag to being individually sliced and assembled into an hamburger.

HAMBURGER BUILD PROCESS

TOP LEVEL VIEW

CONTROLS
Cookbook
Customer Instructions

Inputs
Raw Hamburger
Hamburger Buns

Outputs
Accepted Hamburger
Rejected Hamburgers

Mechanisms
Spatula
Grill
Fuel
Cook

MESSAGES
Hamburger are Ready!

PROCESS FLOW MODEL
MODEL BUILDING METHODOLOGY

• STEP TWO: IDENTIFY AND DEFINE APPROPRIATE ACTIVITIES
  - DEFINE THE MAJOR STEPS THAT OCCUR WITHIN THE SCENARIO BEING DESCRIBED
  - INTERVIEW PARTICIPANTS OF EACH ACTIVITY WITHIN THE SCENARIO
  - CREATE A GLOSSARY FOR RECORDING EACH ACTIVITY DEFINITION

• GUIDELINES
  - CREATE A LIST OF ACTIVITIES
    • LIST EACH ACTIVITY ON A SEPARATE 'POST-IT' SHEET FOR USE DURING THE MODELING PROCESS
    • DOCUMENT THE LIST ON THE FORM PROVIDED
  - DEVELOP DEFINITIONS FOR EACH ACTIVITY
HAMBURGER BUILD PROCESS

STEP TWO: IDENTIFY ACTIVITIES

COLLECT INGREDIENTS

PREPARE GRILL

PREPARE BUNS

FORM PATTIES

COOK HAMBURGER

ASSEMBLE HAMBURGER

DELIVER HAMBURGER

INSPECT HAMBURGER

LIST OF ACTIVITIES

<table>
<thead>
<tr>
<th>NODE#</th>
<th>ACTIVITY NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAM-01</td>
<td>COLLECT INGREDIENTS</td>
</tr>
<tr>
<td>HAM-02</td>
<td>PREPARE GRILL</td>
</tr>
<tr>
<td>HAM-03</td>
<td>PREPARE BUNS</td>
</tr>
<tr>
<td>HAM-04</td>
<td>FROM PATTIES</td>
</tr>
<tr>
<td>HAM-05</td>
<td>COOK HAMBURGER</td>
</tr>
<tr>
<td>HAM-06</td>
<td>ASSEMBLE HAMBURGER</td>
</tr>
<tr>
<td>HAM-07</td>
<td>DELIVER HAMBURGER</td>
</tr>
<tr>
<td>HAM-08</td>
<td>INSPECT HAMBURGER</td>
</tr>
</tbody>
</table>

PROCESS BEING MODELED:
HAMBURGER BUILD PROCESS

ACTIVITY DEFINITIONS

Collect ingredients - collect all ingredients needed to build a hamburger. Ingredients include raw hamburger and buns.

Prepare grill - prepare a grill to cook hamburgers.

Prepare buns - remove buns from bag and slice in half.

Form patties - from the raw hamburger into individual patties.

Cook hamburger - cook hamburgers according to customer instructions.

Assemble hamburger - Combine cooked hamburger with a bun.

Deliver hamburger - deliver assembled hamburger according to the customer instructions.

Inspect hamburgers - Customers inspect hamburgers and determine if they meet their instruction.
MODEL BUILDING PROCEDURE

• **STEP THREE**: ARRANGE ACTIVITIES IN A TIME SEQUENCE
  - DETERMINE WHICH ACTIVITIES OCCUR CONCURRENTLY WITH REGARD TO OTHER ACTIVITIES

• **GUIDELINE**
  - ARRANGE EACH ACTIVITY SHEET ON A BOARD

HAMBURGER BUILD PROCESS

STEP THREE: ARRANGE ACTIVITIES IN A TIME SEQUENCE

<table>
<thead>
<tr>
<th>COLLECT INGREDIENTS</th>
<th>PREPARE BUNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREPARE GRILL</td>
<td>FORM PATTIES</td>
</tr>
<tr>
<td>COOK HAMBURGER</td>
<td>ASSEMBLE HAMBURGER</td>
</tr>
<tr>
<td>DELIVER HAMBURGER</td>
<td>INSPECT HAMBURGER</td>
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PROCESS MODEL BUILDING PROCEDURE

• **STEP FOUR**: IDENTIFY AND DEFINE INPUT AND OUTPUT OBJECTS
  - DETERMINE THE THINGS CONSUMED AND PRODUCED BY EACH ACTIVITY
  - CREATE A GLOSSARY FOR RECORDING EACH INPUT AND OUTPUT DEFINITION

• **GUIDELINES**
  - DRAW LINES BETWEEN ACTIVITIES
  - LABEL THE INPUT AND OUTPUT OBJECTS

NOTE: AN INPUT IS TYPICALLY TRANSFORMED DURING THE ACTIVITY WHILE A CONTROL INFLUENCES THE TRANSFORMATION

- DEFINE EACH INPUT AND OUTPUT OBJECT
HAMBURGER BUILD PROCESS
STEP FOUR: IDENTIFY AND DEFINE INPUT & OUTPUT OBJECTS

INPUT/OUTPUT DEFINITIONS

RAW MATERIAL - UNCOOKED, THAWED, BULK HAMBURGER LOCATED IN THE REFRIGERATOR BUN - PACKAGED UNSLICED HAMBURGER BUN LOCATED IN THE BREAD DRAWER CAPTURED BUN - PACKAGED UN-SLICED HAMBURGER BUN PLACED ON THE TABLE CAPTURED RAW HAMBURGER - UNCOOKED, THAWED BULK HAMBURGER PLACED ON THE TABLE SLICED-BUN - INDIVIDUAL HAMBURGER BUN SLICED IN HALF

PATTIE - UNCOOKED, THAWED, HAMBURGER FORMED INTO INDIVIDUAL PATTIES HOT GRILL - GRILL THAT IS LIT AND UP TO SPECIFIED TEMPERATURE COOKED HAMBURGER - HAMBURGER PATTIES THAT IS COOKED TO CUSTOMERS INSTRUCTIONS ASSEMBLED HAMBURGER - COOKED HAMBURGER COMBINED WITH SLICED BUN DELIVERED HAMBURGER - ASSEMBLED HAMBURGER THAT IS DELIVERED ACCORDING TO THE CUSTOMERS INSTRUCTIONS ACCEPTED HAMBURGER - DELIVERED HAMBURGER THAT PASSES INSPECTION AND IS ACCEPTED BY THE CUSTOMER
The University of Iowa
Intelligent Systems Laboratory

**REJECTED HAMBURGER - DELIVERED HAMBURGER**

That fails to pass inspection and is rejected by the customer.

**PROCESS FLOW MODEL**

**MODEL BUILDING PROCEDURE**

- **STEP FIVE: DETERMINE OBJECT LIFE CYCLE STATES**
  - Identify each input and output life cycle phase and access reason.

- **GUIDELINE**
  - Review each input and output and add life cycle state information (e.g., draft vs. final document).
  - Indicate life cycle states in the model.

- **STEP SIX: DETERMINE DECISION FLOWS JUNCTIONS**
  - Define where logical junctions occur in the model.

- **GUIDELINE**
  - Identify areas where flow links intercept and create decision junctions.
DECISION POINTS/LOGICAL JUNCTIONS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>MEANING</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>&amp;</td>
<td>- asynchronous = INPUTS: All preceding processes must complete AND OUTPUTS: All following processes will start.</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>- Synchronous = INPUTS: All preceding processes must complete simultaneously AND OUTPUTS: All following processes will start simultaneously.</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>- Synchronous = INPUTS: One or more of the preceding processes must complete OR OUTPUTS: One or more of the following processes will start.</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>- Exclusive OR = INPUTS: Exactly one of the preceding processes must complete OR OUTPUTS: Exactly one of the following processes will start.</td>
<td></td>
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PROCESS FLOW MODEL
MODEL BUILDING PROCEDURE

• STEP SEVEN: IDENTIFY AND DEFINE CONTROLS AND MECHANISMS
- DETERMINE THE THINGS THAT PERFORM, SUPPORT, OR GUIDE HOW INPUT OBJECTS ARE TRANSFORMED INTO OUTPUT OBJECTS - INCLUDING: OBJECT STATE CREATION GROUPS, AND OBJECT STATE CHANGE APPROVES - CREATE A GLOSSARY CONTROL AND MECHANISMS

• GUIDELINES
- IDENTIFY THE CONTROLS AND MECHANISMS IN THE MODEL FOR EACH ACTIVITY
- DEVELOP DEFINITIONS FOR EACH CONTROL AND MECHANISM
**HAMBURGER BUILD PROCESS**

**STEP EIGHT: IDENTIFY AND DEFINE CONTROLS & MECHANISMS**

DEFINITION OF CONTROLS AND MECHANISMS

- **COOKBOOK** - Book that contains instructions on how to properly build a hamburger
- **GRILL MANUAL** - Manual that contains instructions on how to safely operate a grill
- **CUSTOMER INSTRUCTION** - Instruction on how well each customer would like their hamburgers cooked and where they would like them delivered
- **REFRIGERATOR** - Place where raw hamburger is kept cold and stored
- **BREAD DRAWER** - Place where buns are stored

**PROCESS FLOW MODEL**

MODEL BUILDING PROCEDURE

- **STEP EIGHT: DEFINE NOTIFICATIONS AND MESSAGES**
  - IDENTIFY THE ACTIVITIES THAT GENERATE COMMUNICATION WITH OTHER ACTIVITIES
  - CAPTURE THE ORIGINATING AS WELL AS RECEIVING ORGANIZATIONS
- **GUIDELINES**
  - IDENTIFY A MESSAGE AT THE APPROPRIATE ACTIVITY

**STEPS:**

1. **COLLECT INGREDIENTS**
2. **PREPARE BUNS**
3. **CAPTURE RAW BURGER**
4. **FORM PATTIES**
5. **FORM BUN**
6. **CAPTURE SLICED BUN**
7. **FORM PATTIES**
8. **REJECT BURGER**
9. **ACCEPT BURGER**
10. **DELIVER HAMBURGER**
11. **INSPECT HAMBURGER**
12. **COOK**
13. **FORM ASSEMBLED BURGER**
14. **DELIVERED BURGER**
15. **REJECTION**
16. **ACCEPT**

**KEY TERMS:**

- **GRILL** - Gas grill
- **FUEL** - Propane
- **MATCHES** - Matchbook
- **KNIFE** - Sharp knife capable of slicing bread
- **SPATULA** - Metal spatula capable of flipping hamburger on the grill
- **CUTTING BOARD** - Wooden surface
- **TABLE** - Counter top used to assemble hamburgers
- **COOK** - Any person that is trained on how to properly build a hamburger
PROCESS MODEL DOCUMENTATION

- CAPTURE ACTIVITY INFORMATION
  - CAPTURE INFORMATION REQUIRED FOR EACH ACTIVITY TO COMPLETE THE MODEL DEFINITION

- GUIDELINE
  - FILL OUT INFORMATION FORMS FOR EACH ACTIVITY