Augmenting BPMN with DMN:
Documenting Process Decision Logic

Sponsored by:
Monteleone Consulting, LLC  Mark A. Monteleone
Independent Consultant and Author
AUGMENTING BPMN WITH DMN:
DOCUMENTING PROCESS DECISION LOGIC
Via two examples and basic tutorials, this webinar reviews two Unified Model Language (UML) techniques: Business Process Model and Notation (BPMN) and Decision Model and Notation (DMN).

The webinar starts with a simple sequential flow application (Peritoneal Dialysis) using a BPMN model with multiple pools, lanes, orchestrations, collaborations, and choreography. After this example, the webinar cites and explains a working set of BPMN elements for business analysts (15 out of 150 elements).

The webinar then expands the topic with a more complex BPMN model with alternate flow gateways. This application involves a project selection of software development methods (Waterfall, Agile, or Hybrid). In this example, DMN augments the BPMN model by documenting the business rules used in the decision process. After this example, the webinar provides an explanation of DMN elements and requirements.

Note: This webinar does not cover business process management nor is it a substitute for formal BPMN / DMN training.
Mark Monteleone is an independent consultant and author of “The 20 Minute Business Analyst: a collection of short articles, humorous stories and quick reference cards for the busy analyst.” He has also written several articles in BA Times, BA Connection, International Association of Facilitators (IAF) Global Flipchart and Modern Analyst. With more than 40 years of experience, he has conducted strategic enterprise analysis and consulted on business applications and project management in more than 35 countries.

Mr. Monteleone holds a B.S. in physics and an M.S. in computing science from Texas A&M University. He is certified as a Project Management Professional (PMP®) by the Project Management Institute (PMI®), a Certified Business Analysis Professional (CBAP®) by the International Institute of Business Analysis (IIBA®) and a Certified Scrum Master (CSM™) and Scrum Product Owner (CSPO™) by the Scrum Alliance.
TODAY’S BUSINESS ENVIRONMENT

Suppliers
Consultants
Offices
Governments
Distributors
Stock Holders
Service Providers
Customers

Business Interaction Model
TODAY’S BUSINESS ENVIRONMENT

Retirement
AGENDA – PART 1

I. Background
   + BPMN/DMN appropriate for today’s environment

II. Part 1
   + First BPMN Model Example – Sequence and Message Flows
     ❖ Peritoneal Dialysis Application
     ❖ Pools, Lanes, Orchestrations, Collaborations, and Choreographies
   + BPMN Basic Tutorial
     ❖ Model Background
     ❖ Business Analyst Working Set of BPMN Elements
     ❖ Events, Tasks, Process, Flows, Gateways, Annotations / Associations

III. Part 2 (Second BPMN Example, DMN – about halfway thru the deck)

IV. Part 3 (Wrap-up, Questions / Answers)
   + References
   + Optional Example Slides on DMN use of Business Knowledge Element
Peritoneal Dialysis (PD) – treatment for kidney disease that uses the patient's stomach peritoneum.

Cycler – machine that forces a cleansing fluid through an abdominal catheter and flushes out the fluid every night while the patient sleeps. This is called Automatic Peritoneal Dialysis (APD).

APD is a straightforward sequence process that involves four participants or "actors":

+ the patient,
+ the cycler machine,
+ the dialysis nurse,
+ and the dialysis equipment supplier.
BPMN MODEL OF APD – EVENTS AND TASKS

Every Night
- Change into Sleeping Attire
- Take Vital Signs
- Turn Cycler on to Warm Tray
- Wash Hands
- Gather Needed Equipment for Cycler
- Conduct SEAL Checklist
- Place Fluid Bag(s) on Cycler Warmer
- Connect Drain Line
- Connect Easy Lock Extenders to Primary Line
- Press Go on Cycler
- Take Vital Signs Again
- Dispose of Used Equipment
- Conduct Dialysis
- Execute Peritoneal Dialysis
- Until four cycles are complete
- Patient: Press Arrow to Request Dialysis Statistics
- Patient: Close All Clamps and Disconnect Cycler
- Patient: Press Go Cycler
- Patient: Turn Off Cycler Cycler

Drain Volume
Ultimate Filtration,
Average Dwell Time

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BPMN MODEL OF APD – SUBPROCESS
BPMN SUBPROCESS COLLAPSED AND EXPANDED [+]

Child Tasks for Subprocess Take Vital Signs

- Measure Weight
- Measure Blood Pressure
- Measure Temperature
- Record Vital Signs
Conduct Dialogue with Cycler
(Graphic Use Case)

1. Patient connects Drain Line.
2. Patient connects Easy Lock Extenders to Primary Line.
3. Patient breaks the Cone on each bag.
4. Patient disinfects hands.
5. Cycler may need to reprime the Patient Line if Extenders are used.
6. Patient needs to wear surgical mask when removing MiniCap.
7. Patient opens clamp on transfer set.
BPMN MODEL OF APD – SUPPORTIVE PROCESSES
BPMN MODEL OF APD – SUPPORTIVE PROCESSES

Order Dialysis Supplies

Patient

Once a Month

Inventory Dialysis Supplies

Order Dialysis Supplies

Send Order

Ship Dialysis Equipment

Dialysis Equipment Supplier

“Black Box Pool”

Replenish Dialysis Supplies

Patient

Once a Month

Inventory

Replenishment Complete

Dialysis Supplies

Replenish Inventory

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BPMN MODEL OF APD – EVENTS

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BPMN BACKGROUND

- BPMN 2.0
  + Specification is over 450 pages
  + **Over 150 elements**
  + How decisions are made are not modeled (addressed with DMN in next example)
- Graphical language for specifying business processes
- Developed by the Business Process Management Initiative (BPMI) which merged with the Object Management Group (OMG) in 2005
- OMG maintains the Unified Modeling Language (UML) which consists of techniques such as Use Case, Class, State, etc.
- BPMN 2.0 is the current version – issued in 2011
BPMN CHALLENGE

- BPMN is a language and like most languages are:
  - Initially overwhelming
    - However most models need less than 10% of the elements (BPMN 2008 Study - see references) – key here is to develop a working set
  - Easy to forget
    - The correct use of the more complex elements due to lack of use
  - Enamored with complex elements
    - Keep it simple – otherwise audience focuses on the modeling technique rather than the business
BPMN WORKING SET OF FLOWS

- **Orchestration** - ordered sequence flow between lanes, events, tasks, processes, gateways within a pool
- **Collaboration** - a message flow between lanes (actors) in different pools
- **Choreography** – an interaction flow, a set of message exchanges between two participants. Task participants are displayed in the various bands of the element.
BPMN WORKING SET OF ELEMENTS

- 15 of 150 elements

- Start
- Intermediate
- End

- Gateway
- Fork/Join
- Inclusive Decision/Merge

- Sequence Flow

- Message Flow

- Data

- Annotation

- Pool
- Lane

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BPMN WORKING SET OF ELEMENTS

× 15 of 150 elements
BPMN WORKING SET OF ELEMENTS

15 of 150 elements

- Start
- Intermediate
- End
- Task
- Subprocess
- Gateway
- Fork/Join
- Inclusive Decision/Merge
- Data
- Annotation

Sequence Flow
Message Flow
Association

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BPMN WORKING SET OF ELEMENTS

× 15 of 150 elements

- Start
- Intermediate
- End
- Task
- Subprocess
- Gateway
- Fork/Join
- Inclusive Decision/Merge
- Data
- Annotation
- Sequence Flow
- Message Flow
- Association

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I. Background

II. Part 1

III. Part 2
   + Second BPMN Model Example - Gateways
     ◆ Project Decisions on Software Development Methodology
     ◆ Decision Tasks and Gateways
   + DMN Tutorial
     ◆ Model Background
     ◆ DMN Elements and Requirements
     ◆ Decision, Business Knowledge, Knowledge Source, Input Data, Information Requirement, Knowledge Requirement, Authority Requirement

IV. Part 3 (Wrap-up, Questions / Answers)
   + References
   + Optional Example Slides on DMN use of Business Knowledge Element
Software Development – during the vision and scoping of a project, the project manager decides on what software development approach will be used. The project manager bases this decision on project, team, and risk criteria. The result may involve waterfall, agile, or both approaches for the project.

Software development approaches typically are:

+ Waterfall – elicit all requirements upfront culminating in a signed-off Business Requirements Document (BRD)
+ Agile (iterative/incremental) – elicit some of the features in a dynamic backlog
+ Hybrid – use of both waterfall and agile
BPMN SOFTWARE DEVELOPMENT EXAMPLE

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BPMN SOFTWARE DEVELOPMENT BUSINESS RULE TASK

- Business Rule Type
- Association and Annotation
- Decisions

Evaluate Project and Team Conditions

Software Development Approach, Agile Team / Customer Conditions

Approach?

Waterfall

Agile

BPMN Task
DMN – SOFTWARE DEVELOPMENT APPROACH

Decision Requirement Diagram (DRD)

- Project Characteristics
- Actual Team/Customer Conditions
- Software Development Approach
- Agile Team / Customer Conditions
- Project Management Office (PMO)
CONNECTING THE MODELS

BPMN

DRD

Decision Tables

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## Solution Development Approach

<table>
<thead>
<tr>
<th>Hit Policy A</th>
<th>Project Characteristics</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Logic Pattern</td>
<td>Requirements Document Mandatory (Yes, No)</td>
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A “-” value is irrelevant to conclusion.
## Agile Team/Customers Conditions

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DMN BACKGROUND

× DMN 1.0

+ Published by OMG in 2015 – specification is under 200 pages
+ Graphical language for specifying business decisions
+ Allows for a simpler representation of processes without having gateways for each business rule used in decisions
+ A way of defining business rule combinations via decision boxes (tables)
+ Allows changes in either the business rules or process without impacting the other
Finding complete examples of a BKM is difficult. Perhaps the best approach is to avoid them until more examples are published (i.e., use the decision element instead).
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NINE ALLOWABLE RELATIONSHIPS IN DMN

- Decision → Decision
- Decision → Knowledge Source
- Business Knowledge → Decision
- Business Knowledge → Business Knowledge
- Input Data → Decision
- Input Data → Knowledge Source
- Knowledge Source → Decision
- Knowledge Source → Business Knowledge
- Knowledge Source → Knowledge Source
- Knowledge Source → Knowledge Source

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AGENDA – PART 3

I. Background

II. Part 1

III. Part 2

IV. Part 3 Wrap-up – Questions / Answers
   - References
   - Optional Example Slides on DMN use of Business Knowledge Element
• Business Process Model and Notation (BPMN) and Decision Model and Notation (DMN) are good ways to model today’s business environment.

  ❖ Many more of our business processes today are global and involve several business partners (e.g., value chains cross business boundaries).

  ❖ Many people are retiring and walking away with a lot of business knowhow (e.g., how decisions are made go undocumented).

• DMN together with BPMN provide us complementary models to document not only our joint processes, but the business rules used in process decisions.
For follow-on questions after the webinar contact the author at mark.a.monteleone@sbcglobal.net
or access his website http://baquickref.com

It's QUESTION TIME!!

AND HOPEFULLY ANSWER
**REFERENCES**

- **BPMN and DMN References**
  - **BPMN Method and Style**: A levels-based methodology for BPM process modeling and improvement using BPMN 2.0 by Bruce Silver
  - **DMN Method and Style**: The Practitioner’s Guide to Decision Modeling with Business Rules by Bruce Silver (2016)

- **BPMN Study and comments**
  - [http://www.cebpi.org/2008/03/03/how-much-bpmn-do-you-need/](http://www.cebpi.org/2008/03/03/how-much-bpmn-do-you-need/)

- **BPMN 2.0 and DMN 1.0 Specifications**
  - [http://www.omg.org/spec/BPMN/2.0/](http://www.omg.org/spec/BPMN/2.0/)
  - [http://www.omg.org/spec/DMN/1.0/](http://www.omg.org/spec/DMN/1.0/)

- **BPMN 2.0 and DMN 1.0 Poster**

- **Comparison of Business Process Modeling Notation tools**

- **Modern Analyst articles used as a basis for examples**
  - [Home Peritoneal Dialysis: a BPMN model and use of 5S principles](#)
  - [Expanding black box pools on an existing BPMN model](#)
  - [An Example of Choosing a Hybrid SDLC using BPMN and the Decision Model](#)
OPTIONAL EXAMPLE SLIDES
ON DMN USE OF BUSINESS KNOWLEDGE ELEMENT
DMN - SOFTWARE DEVELOPMENT APPROACH

Decision Requirements Diagrams (DRD)

- Project Characteristics
- Actual Team/Customer Conditions
- Foreign Project Environment Characteristics
- Software Development Approach
- Agile Team / Customer Conditions
- Foreign Project Risk Rating
- Project Risk Ratings
- Project Management Office (PMO)

The BKM (outlined in red) is not verified.
DMN - SOFTWARE DEVELOPMENT APPROACH

Decision Requirements Diagrams (DRD)

- **Project Characteristics**
- **Actual Team/Customer Conditions**
- **Foreign Project Environment Characteristics**

**Software Development Approach**

- **Agile Team / Customer Conditions**
- **Foreign Project Risk Rating**

**Project Risk Ratings**

**Project Management Office (PMO)**

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DMN - SOFTWARE DEVELOPMENT APPROACH

Decision Requirements Diagrams (DRD)

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CONNECTING THE MODELS

BPMN

Software Development Approach, Agile Team Conditions

Evaluate Project and Team Conditions

Approach?

Waterfall

Agile

DRD

Decision Tables

Project Characteristics

Software Development Approach

Actual Team/Customer Conditions

Agile Team / Customer Conditions

Foreign Project Environment Characteristics

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Project Risk Ratings

Project Management Office (PMO)

Software Development Approach

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## DMN MODEL – DECISION TABLE

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# DMN MODEL – BKM DECISION TABLE

## Project Risk Rating

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### Foreign Project Risk Rating

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These rules apply to any foreign project: construction, software, retail, manufacturing, etc.
- a “-” value is irrelevant to conclusion

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