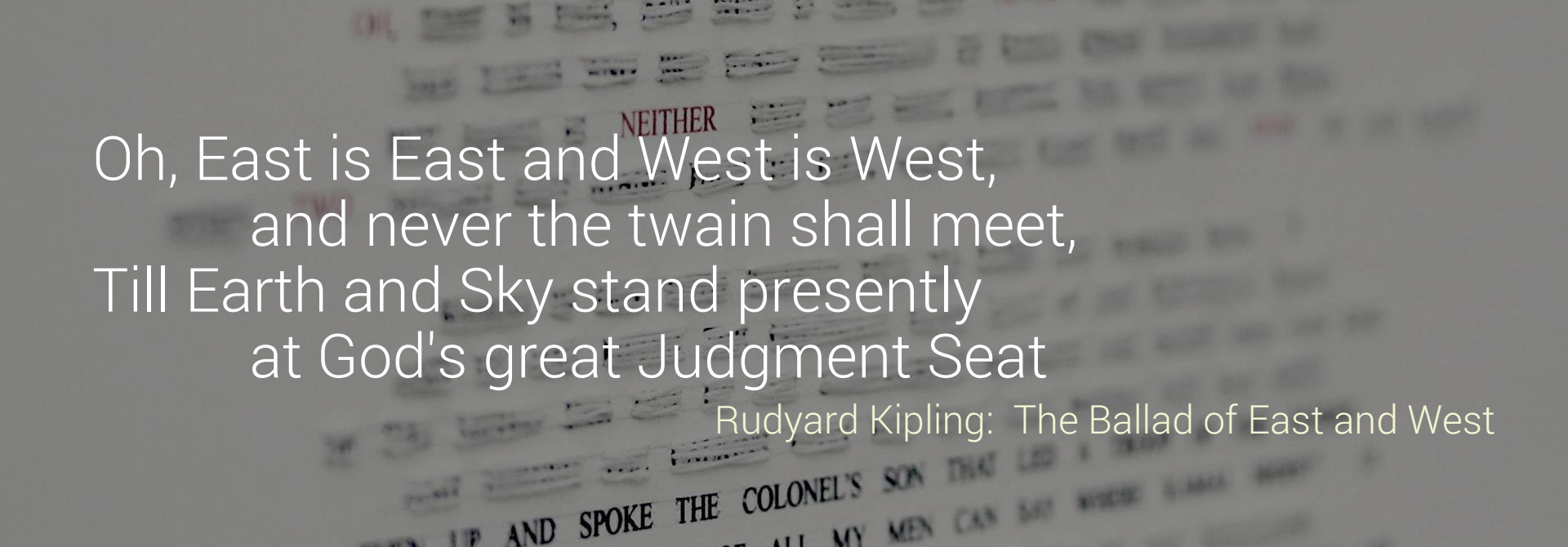


Modeling decision-making processes:

Melding process models and decision models

Dr Alan N Fish

Principal Consultant, Decision Solutions, FICO



Oh, East is East and West is West,
and never the twain shall meet,
Till Earth and Sky stand presently
at God's great Judgment Seat

Rudyard Kipling: The Ballad of East and West

Image: Camella Daeun Kim

Two domains

Business process models & decision models

Two domains of modeling

East and West

- Business processes
 - Extend over time
 - Modeled as sequence flows between activities
 - Used to manage states and events
 - Nothing but side effects
 - Change slowly & rarely
- Decisions
 - Instantaneous
 - Modeled as requirements between decisions, data and knowledge
 - Implemented as stateless services
 - No side effects
 - Change rapidly & often

Two domains of modeling

Meeting points

- Process model

- Models a single case / instance of a process
- Includes decision-making as one type of activity
- Gathers data required by decision-making in process activities
- Uses the results of decisions in gateways and activities
- Triggers decision-making on occurrence of events
- Handles events raised by decision-making

- Decision model

- Models a single case / instance of decision-making
- Defines the decision-making taking place in an activity
- Uses input data gathered by process activities
- Provides decision results for use in process activities
- Uses event data to determine best response
- Detects patterns and generates process events

Two domains

Three domains?

- Decisions modeled in DMN
- Processes and events modeled in BPMN
- BPMN maps events to processes
- Decision services map decisions to process activities
- Decision-event mapping yet to be defined(?)

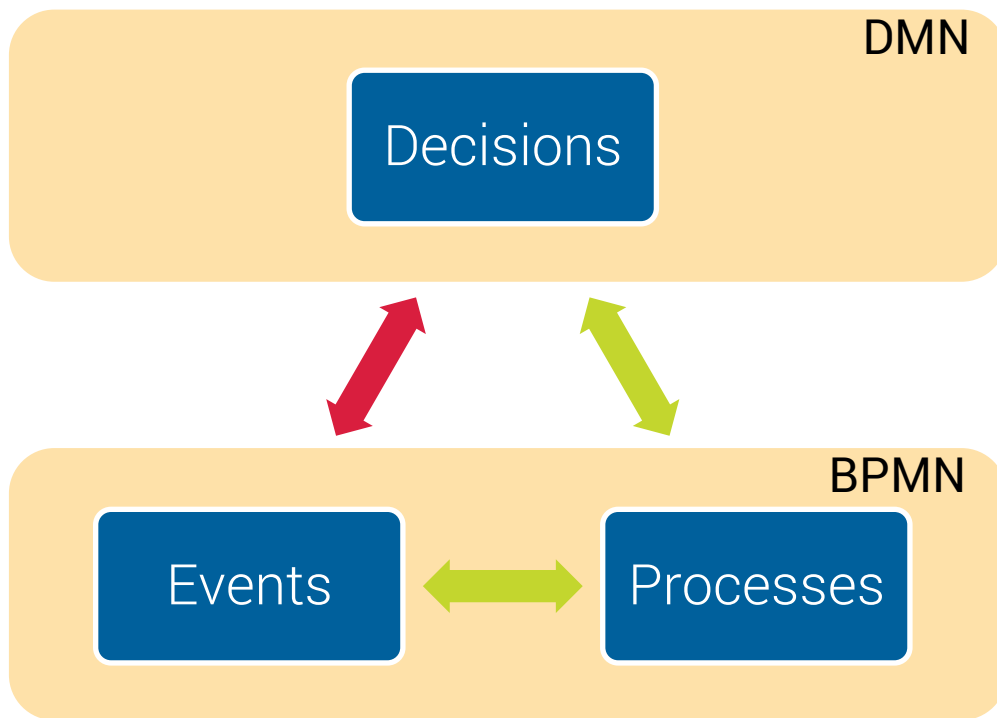




Image: Camella Daeun Kim

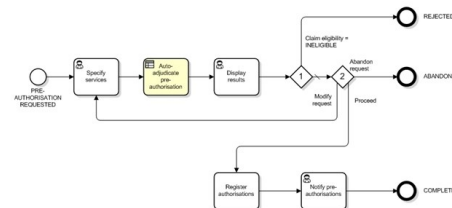
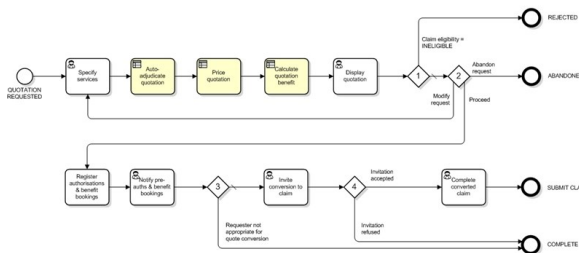
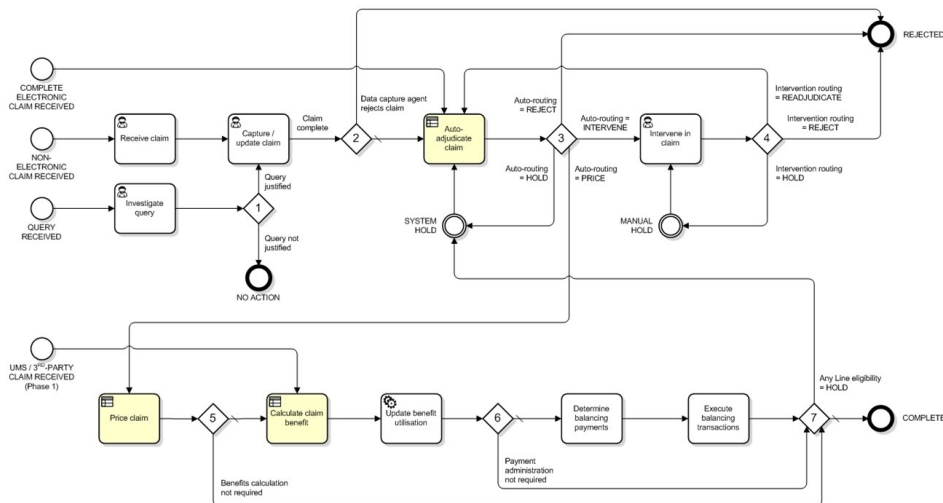
Simple stitching

An example of straightforward combination of BPMN & DMN

Case Study 1

Business process modeling

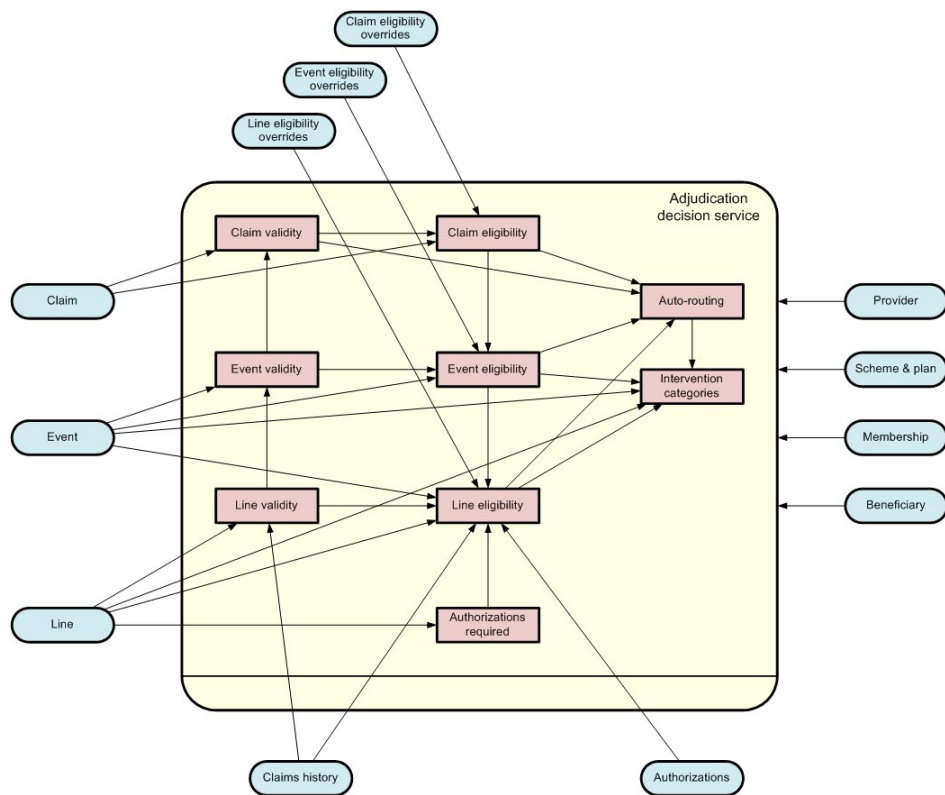
- DRA methodology
- Modeled 3 business processes
- Identified 7 decision points satisfiable by 3 reusable decision services
- Decision services reused in different combinations in different processes



Case Study 1

Decision modeling: high level

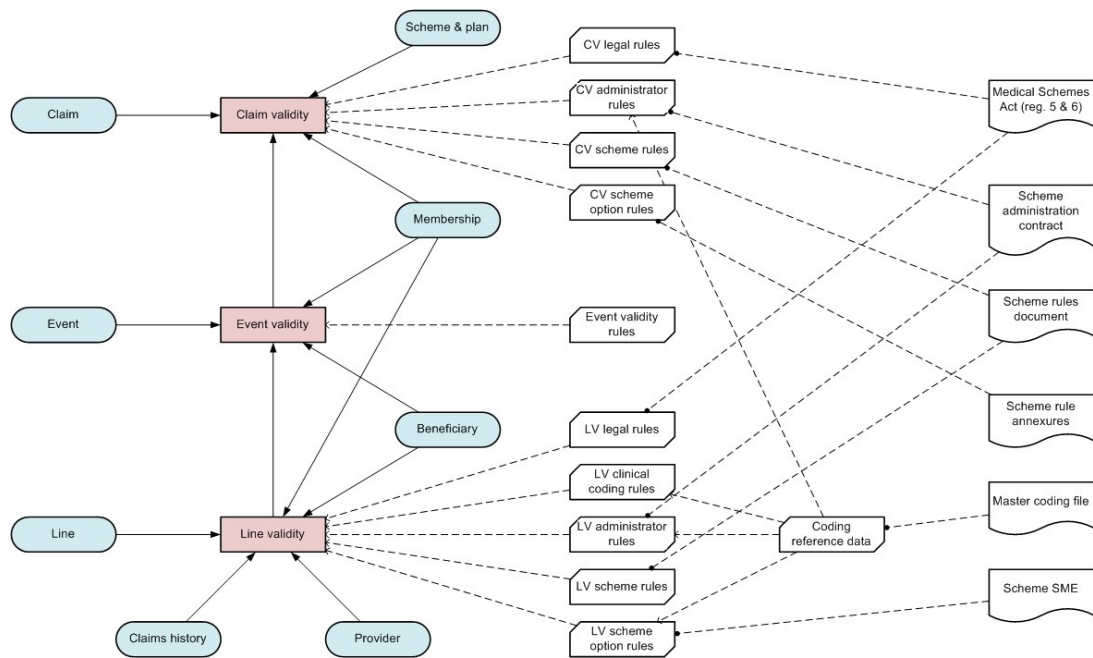
- Each decision service modeled as a DRD
- Input data identified and mapped to activities in process model
- Decisions in later services depend on decisions in earlier services: modeled in DRDs



Case Study 1

Decision modeling: detail

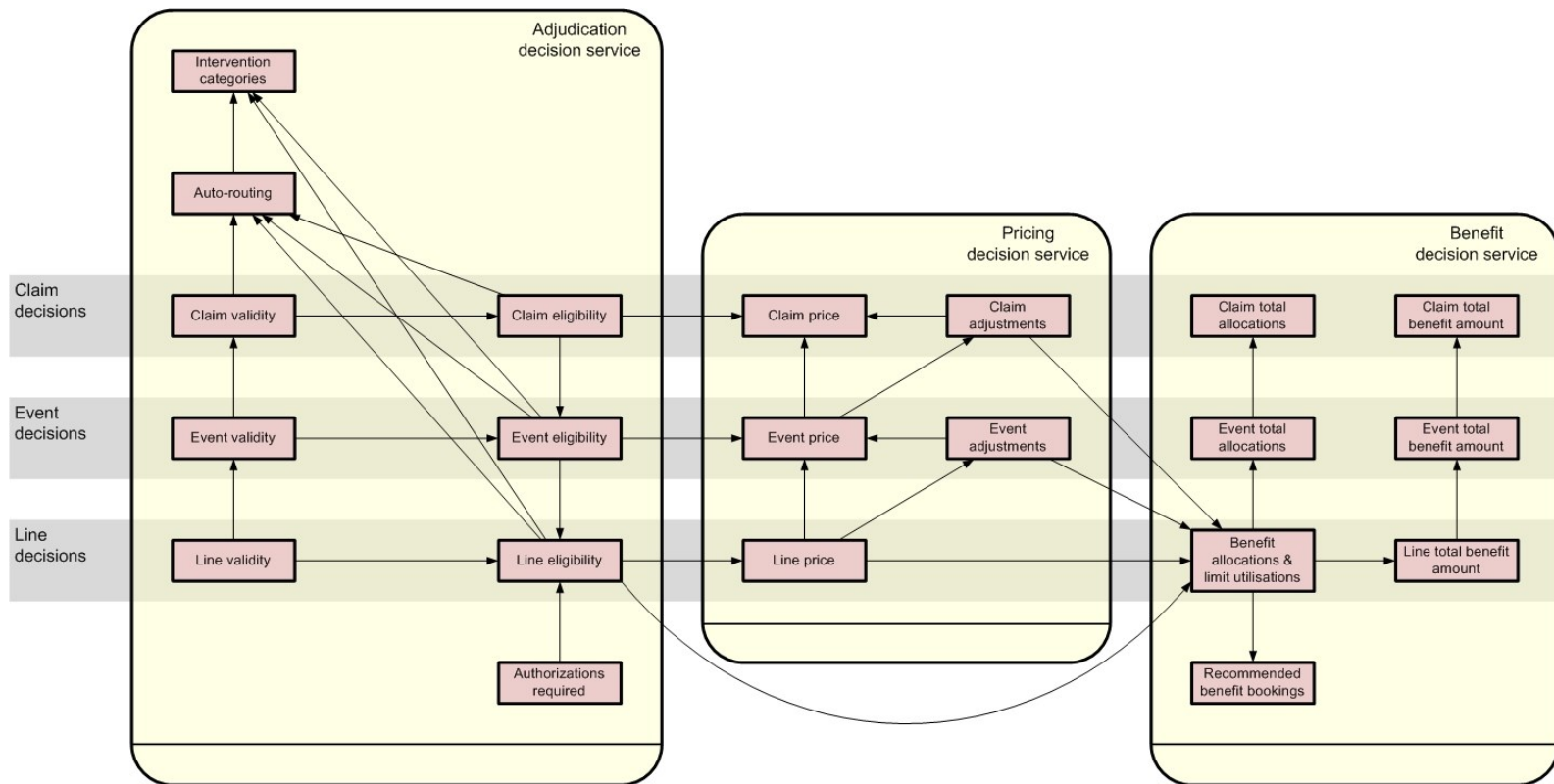
- All business knowledge and knowledge sources identified
- Revealed reuse of BKM's and common KSs
- Used to accurately scope, plan and cost the implementation project



Case Study 1

Full decision model

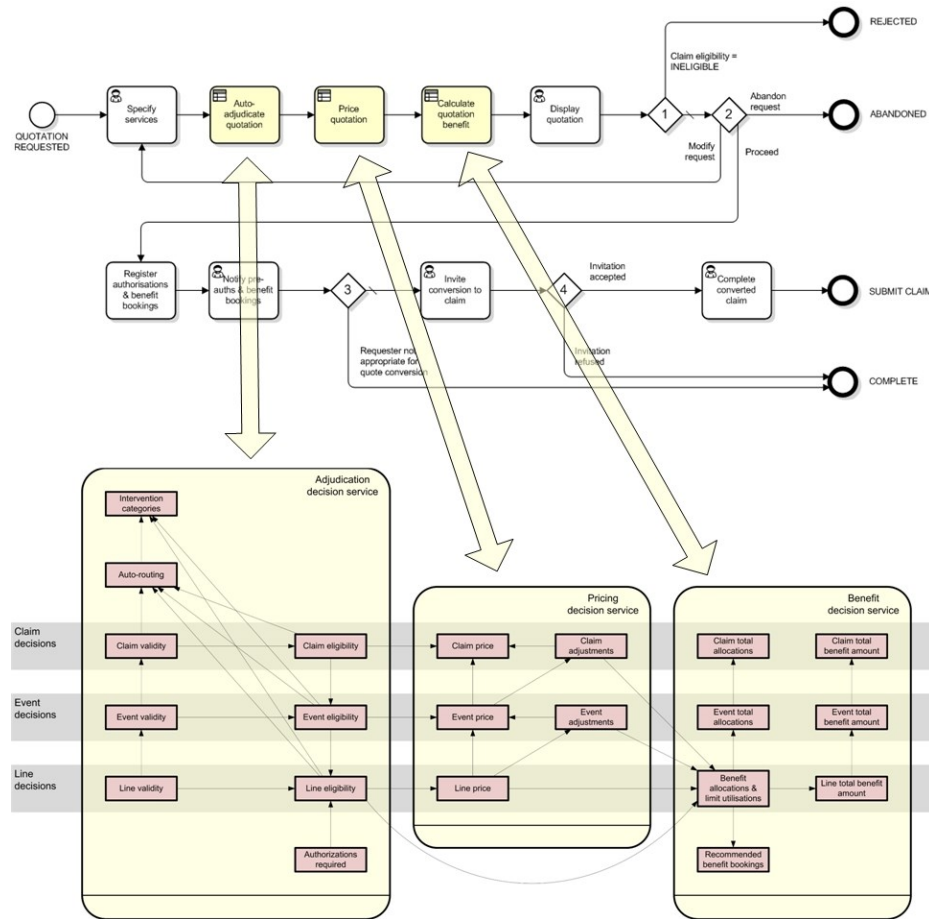
- DRD shows all dependencies between services

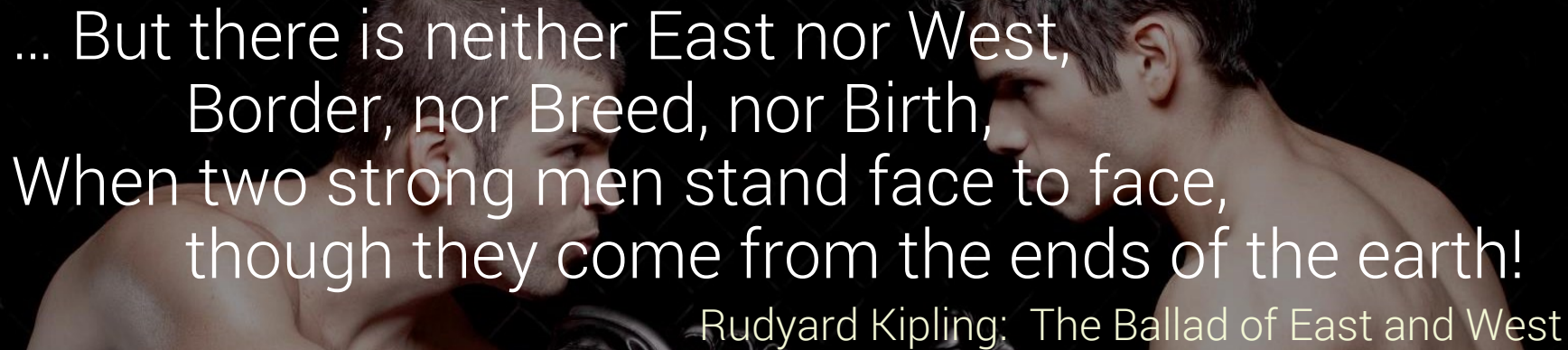


Case Study 1

Mapping complete

- All decisions associated with services called in process activities
- Input data provided by process activities
- Decision results consumed by process
- All dependencies are clear:
 - Between services and process
 - Between services





... But there is neither East nor West,
Border, nor Breed, nor Birth,
When two strong men stand face to face,
though they come from the ends of the earth!

Rudyard Kipling: The Ballad of East and West

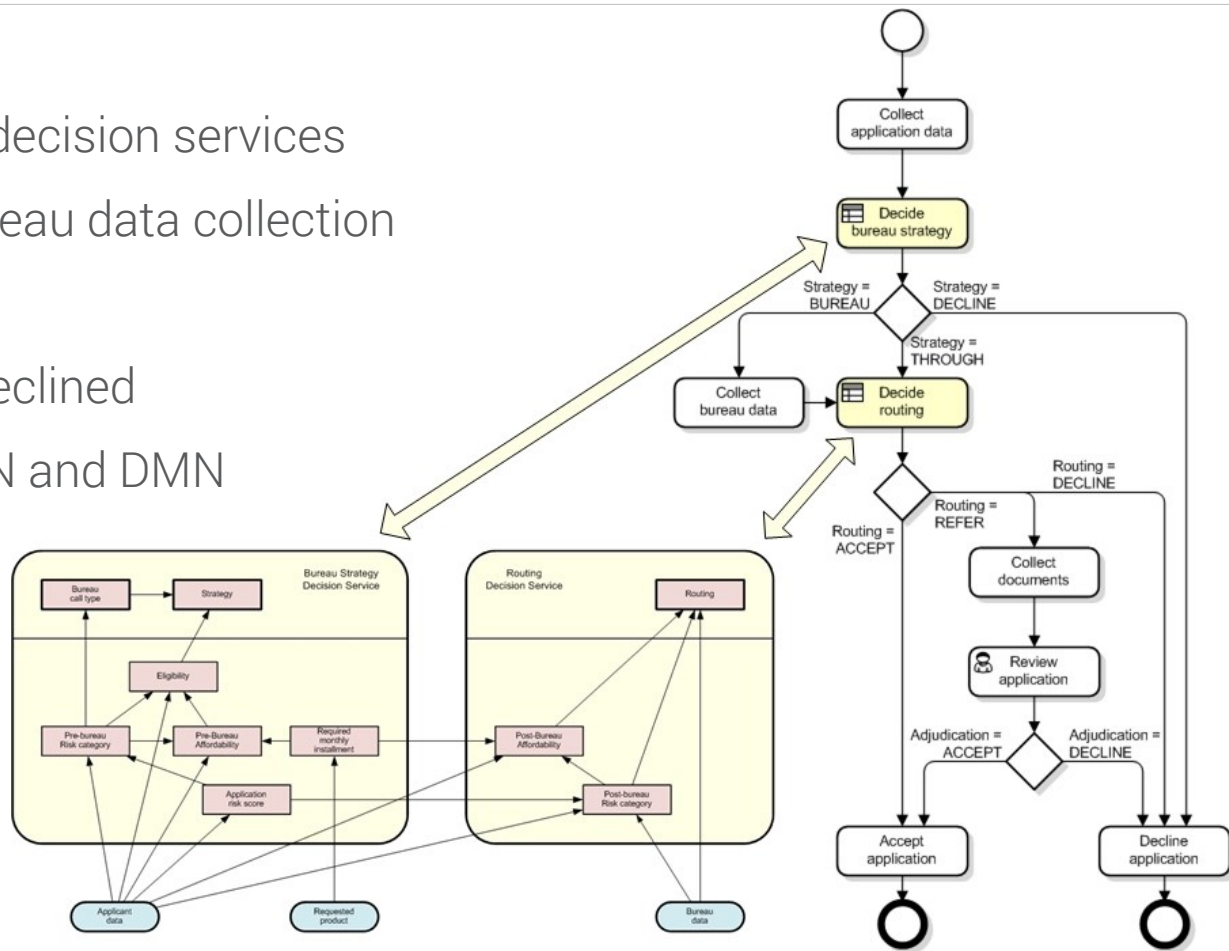
Conflict or complement?

The contested space between domains

Example from DMN 1.1

DMN Specification, clause 11

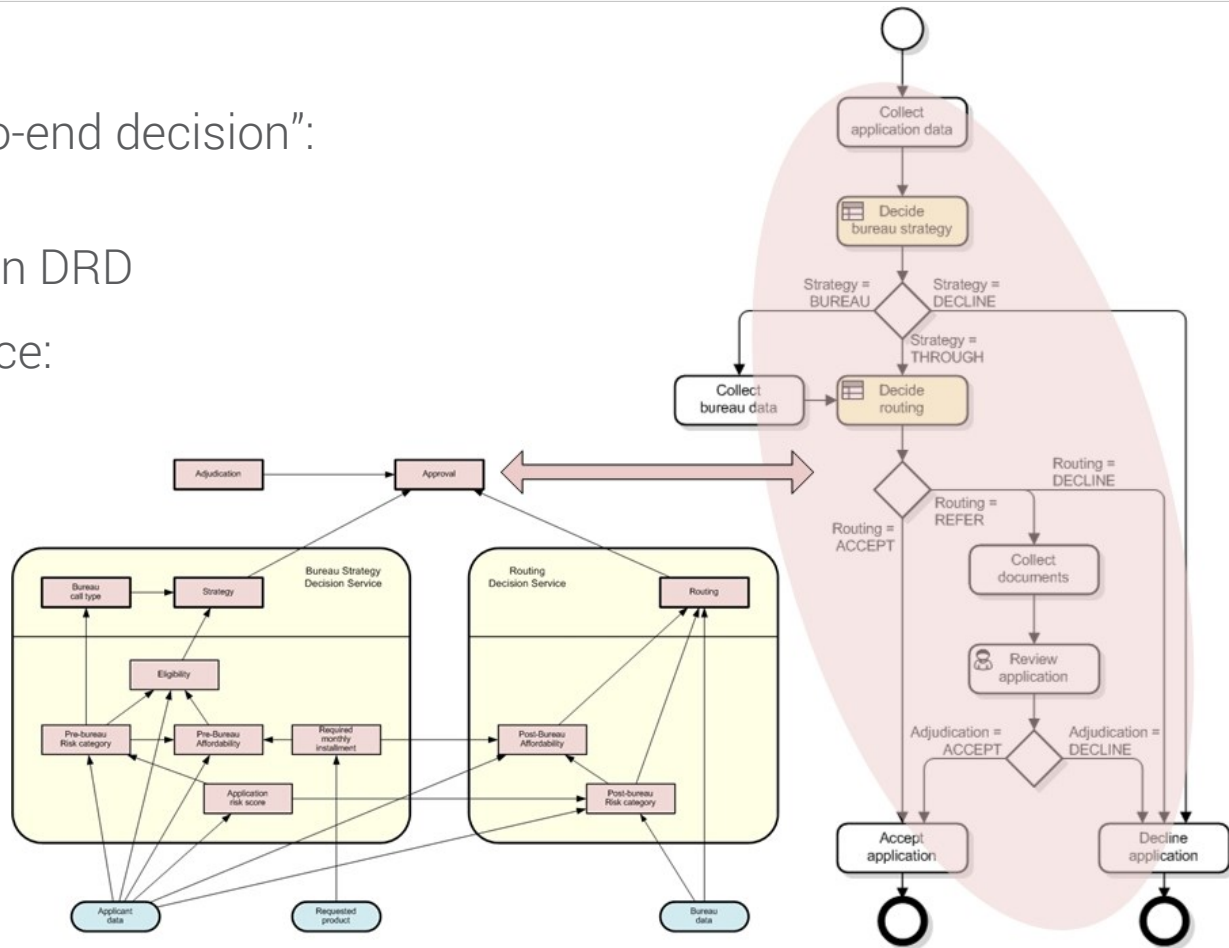
- Two decision points, two decision services
- Branch for conditional bureau data collection
- Possible human review
- Application accepted or declined
- No overlap between BPMN and DMN



Example from DMN 1.1

Bruce Silver's "Method & Style"

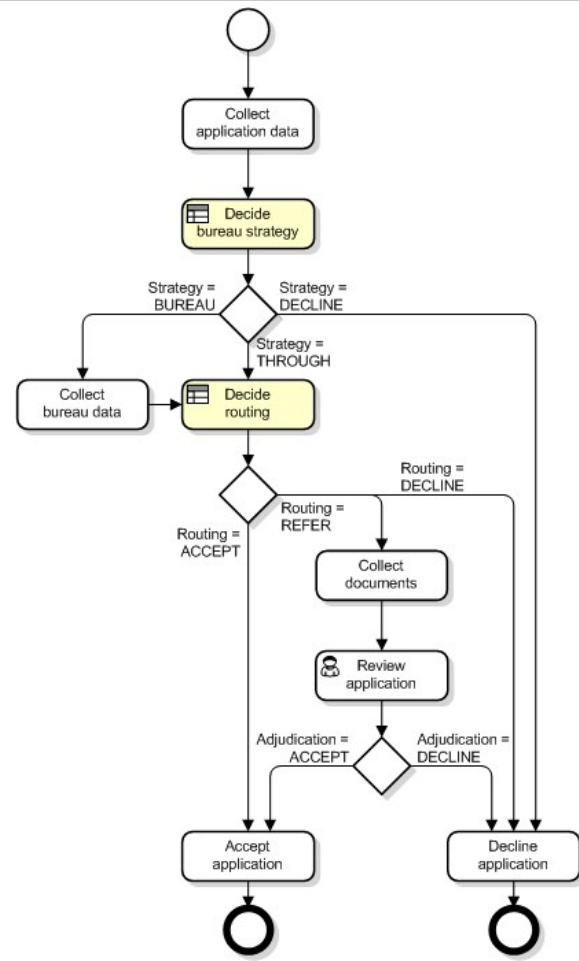
- Introduces a single "end-to-end decision": *Approval*
- Approval decision shown in DRD
- Approval logic defined twice:
 - in DMN as decision table
 - in BPMN as gateways



Example from DMN 1.1

Reconciliation

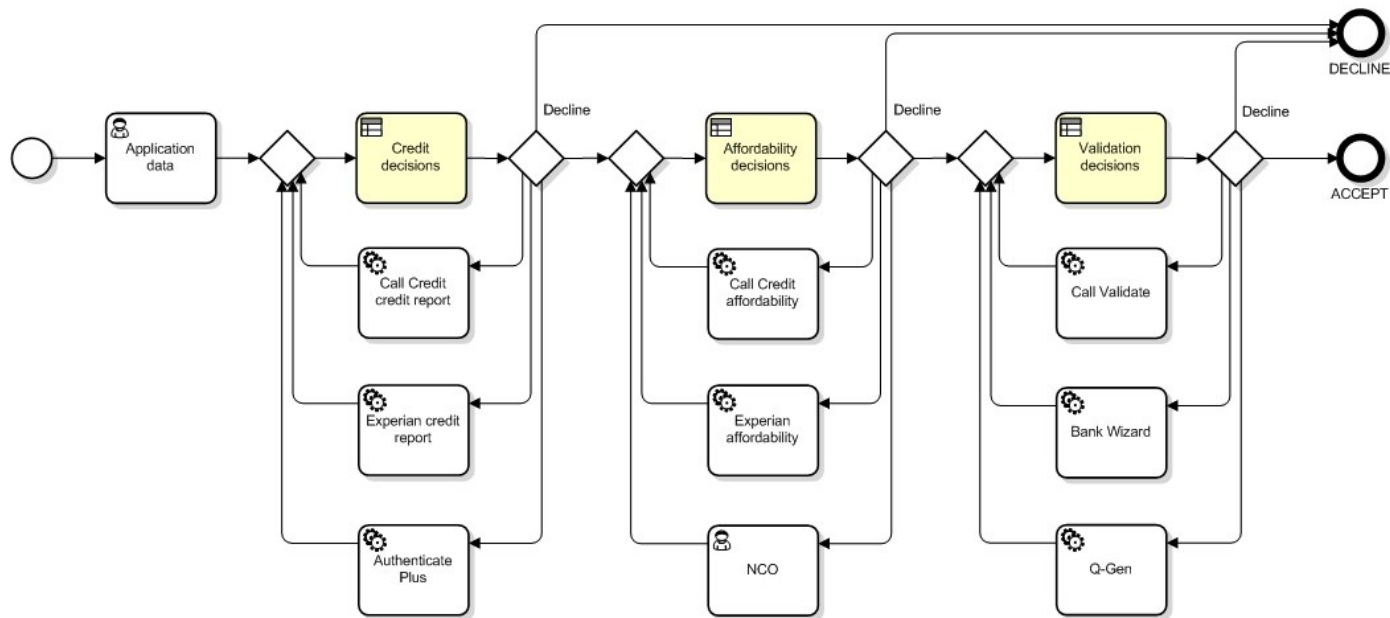
- Shared concerns:
 - This example business process *does* implement a decision not modelled in example DMN
 - There is an overlap between what can be modelled in DMN and what can be modelled in BPMN
 - How you deal with the overlap is a matter of method and style
 - Real-world processes much more complex, therefore “end to end decision” more complex
- Possible approach: remove decision logic from BPMN
 - Simplify process
 - Minimize overlap



Case study 2

Chain of re-entrant decision services

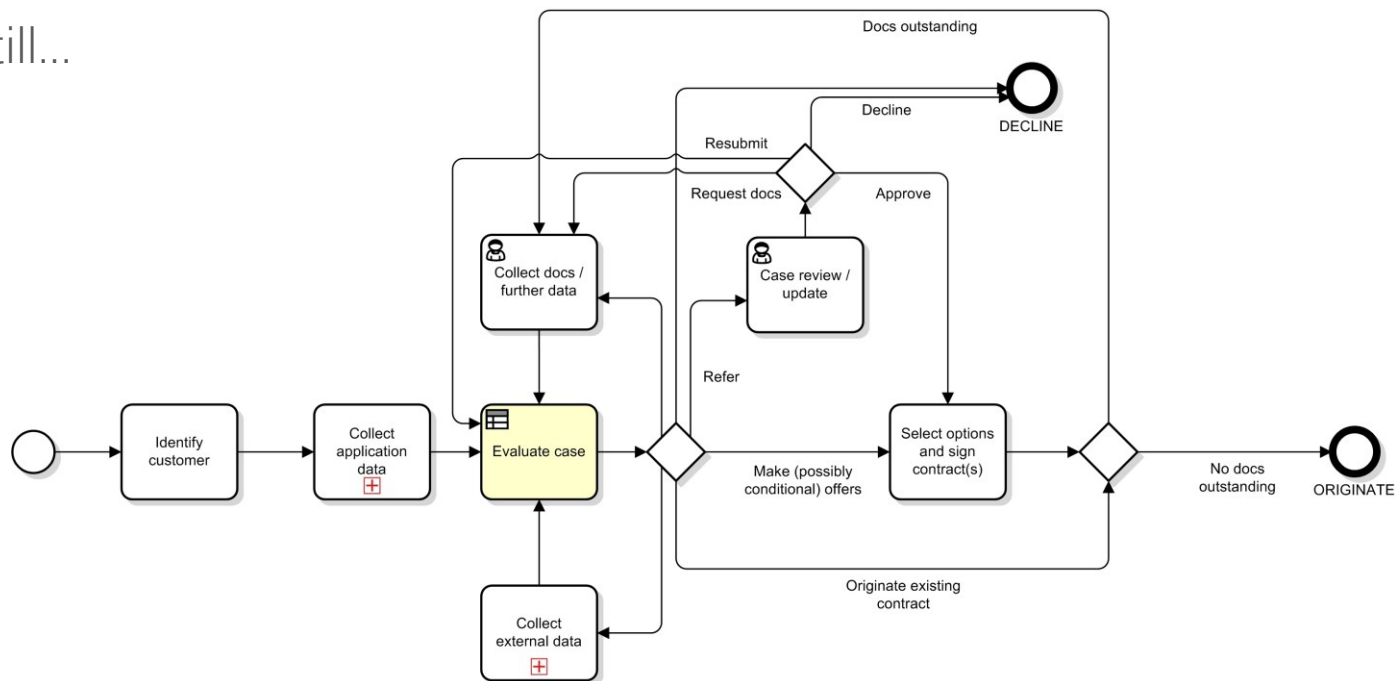
- Three phases of decision-making
- Each service gathers information until it can decline or progress the case
- Data collection logic moved from BPMN into rules
- Can go further...



Case study 3

Generic process with a single central re-entrant decision service

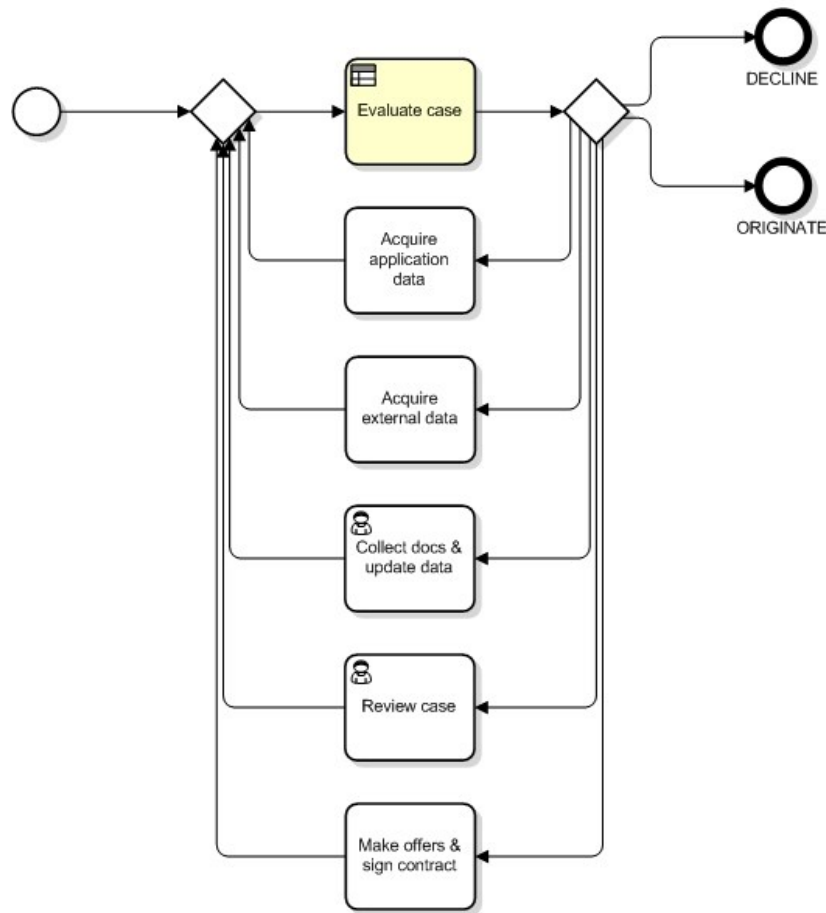
- Routes case for data collection / review tasks as necessary
- Almost all sequence logic in decision service
- Can go further still...

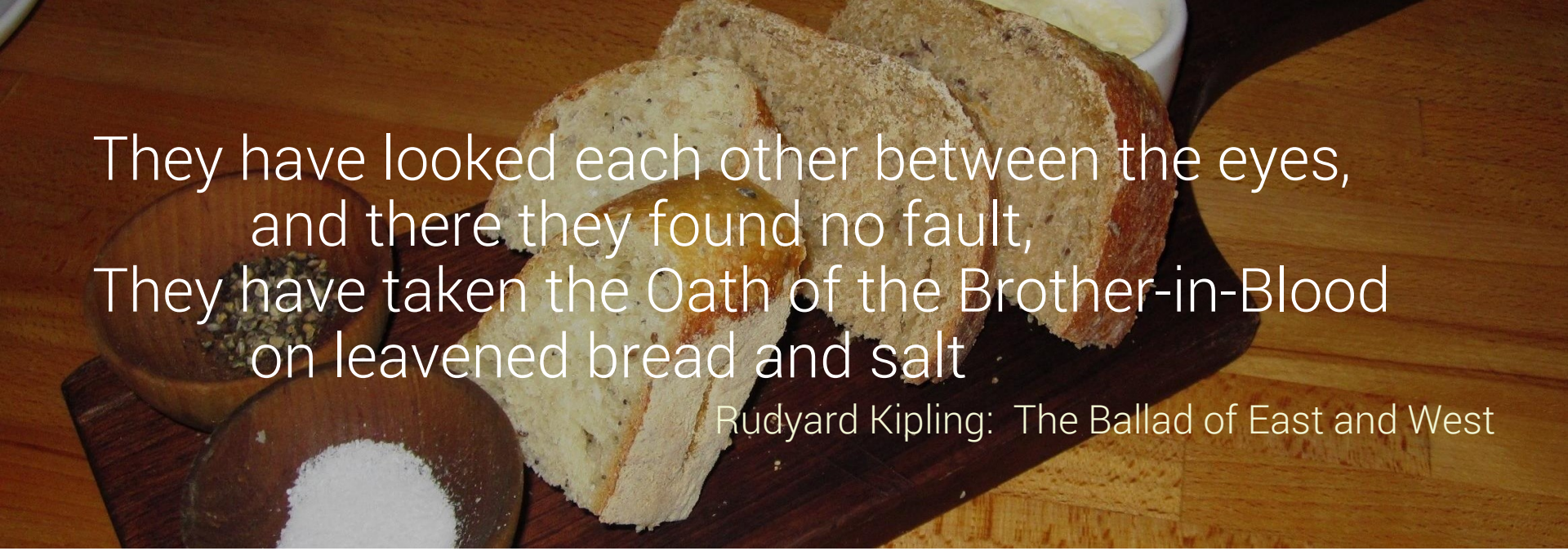


Pure decision service solution

Decision service responsible for process flow

- All activities return to decision service
- All logic in service, none in process
- Issues:
 - Clients unhappy to lose process flow
 - Hard to represent sequences in rules
 - Decision service becomes a state machine
 - ... or a BPMN emulator





They have looked each other between the eyes,
and there they found no fault,
They have taken the Oath of the Brother-in-Blood
on leavened bread and salt

Rudyard Kipling: The Ballad of East and West

Problem or opportunity?

Overlap as flexibility

Conclusions

- Potential overlap between BPMN and DMN occurs whenever:
 - decisions extend over time (inevitable if the process is seen as implementing an “end-to-end decision”), or
 - when there are decisions to be made about the sequence of tasks in a process.
- Approaches:
 - Model overlap in both BPMN & DMN and cross-validate
 - Minimize overlap using re-entrant decision services
 - See process as containing a series of separate instantaneous decisions
- ALL the above are appropriate solutions in different circumstances; business analysis always involves choosing between alternative models
- My preferred approach – using DMN to specify services called by BPMN – will be adopted in FICO DMS.

Thank You

Dr Alan N Fish
afish@fico.com