



# The Decision Model: A Presentation for Business Analysts

Barbara von Halle

Managing Partner, Knowledge Partners International, LLC

[BvonHalle@kpiusa.com](mailto:BvonHalle@kpiusa.com)

---

# *In the News*



- Software: KPI and eDev to offer automated approach to Decision Modeling and Requirements Definition : InteGREAT requirements suite.



- Workshop: Using Business Decision Management to Revolutionize Business Requirements and Processes



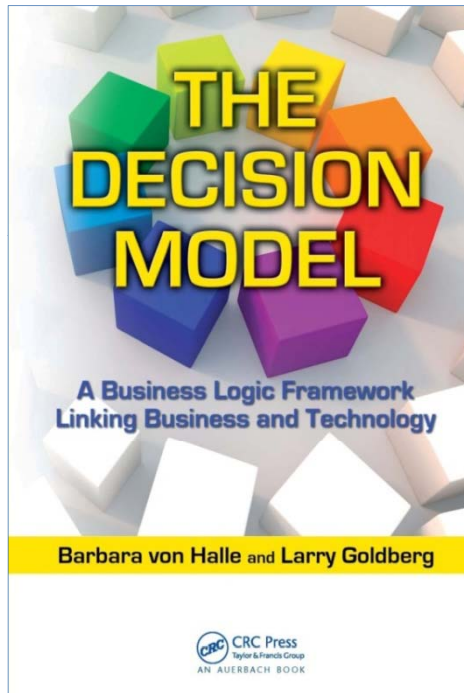
September 15 DC, Nov 1 NYC:  
KPI (approach)  
Freddie Mac (practitioner)  
eDevTech (software)

# Learning Objectives:

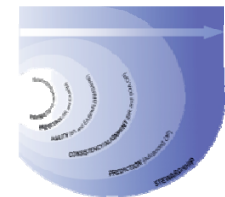
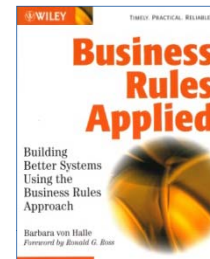
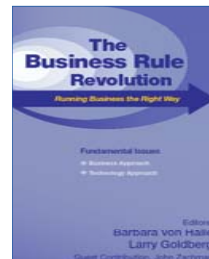


- 
- Separate and model business logic (rules) as the missing piece in requirements
  - Recognize that business logic (rules) has its own structure and integrity different from other modeled assets.
  - Create a Decision Model following a step-by-step agile and iterative approach
  - Integrate The Decision Model and Visualization with Requirements

# About KPI: Thought Leader



“..one of the classic books of a new era in computing that will have much traction in the next few years” Dr. Opher Etzion, Master Inventor, IBM



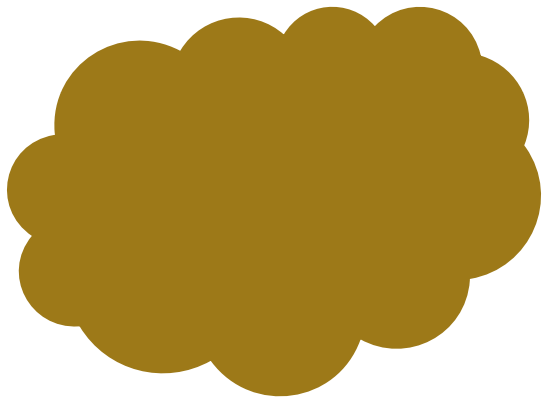
- The Decision Model
- STEP Methodology and Training for Business Decision Management  
Business Process Management  
Business Requirements  
Business Logic Testing
- Leading provider of methodology and consulting to Global 1000 companies since 1997

# Agenda

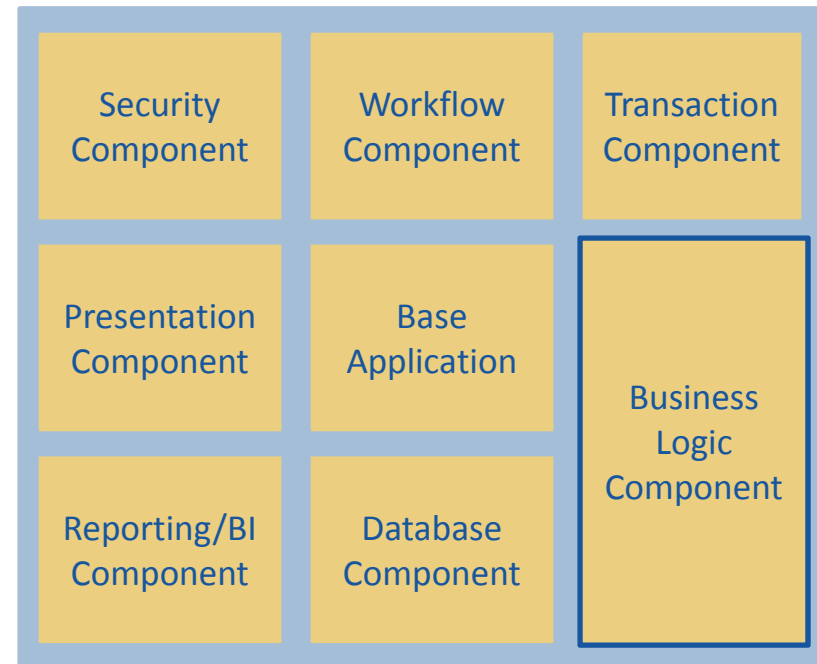
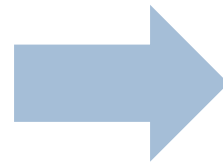


- 
- **The Problem of Business Rules (Logic)**
  - Introduction To The Decision Model
  - Building a Decision Model Step-by-Step
  - Decisions versus Process
  - The Decision Model, Visualization in Requirements
  - Summary

# Separation of Concerns: The One Dimension Left Behind



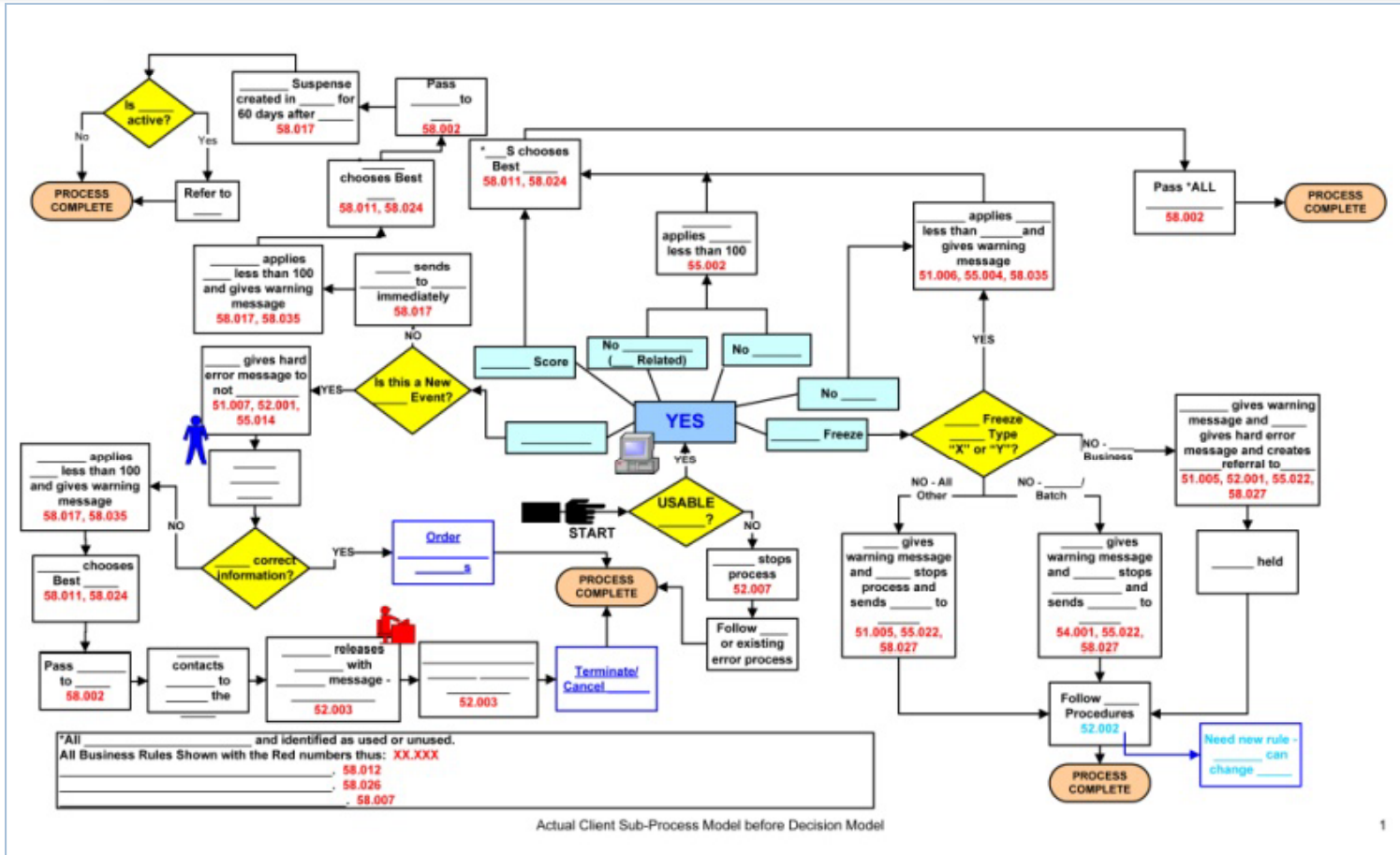
Traditional Application  
Architecture – A “Big  
Ball of Mud” (Foote &  
Yoder)



Component Based  
Application Architecture

Source: Ken Orr

# How Business Rules (Logic) are Handled Today



# What History Teaches Us



---

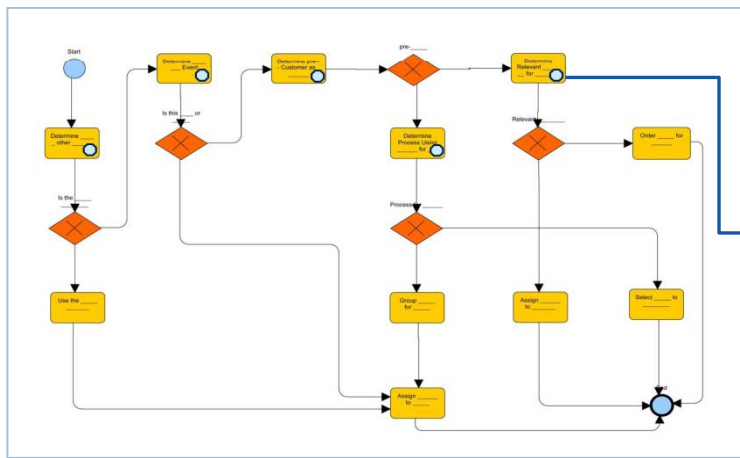
## The Relational Model

- Changes the way we manage, leverage, store data
- Recognizes that data has its own existence
- Elevates data as an organizational asset
- Introduces rigor through normalization principles
- Impacts technology, methodology, and best practices

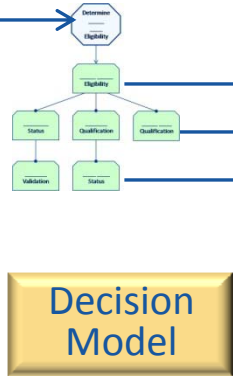
## The Decision Model

- Changes the way we manage, leverage, store business logic
- Recognizes that business logic has its own existence
- Elevates business decisions (logic) as an organizational asset
- Introduces rigor through normalization principles
- Impacts technology, methodology, and best practices

# How The Decision Model Changes Everything



**Process Model**



**Decision Model**

**Rule Families**

# Agenda



- 
- The Problem of Business Rules (Logic)
  - **Introduction To The Decision Model**
  - Building a Decision Model Step-by-Step
  - Decisions versus Process
  - The Decision Model, Visualization in Requirements
  - Summary

# Definition of Business Logic



Business Logic is the means by which the business derives conclusions from facts.

The simplest case is the evaluation of single fact, leading to a single conclusion:

One example of such a statement:

A person has a poor employment history



A person is highly likely to default on a loan

# What is an Atomic Piece of Business Logic?

---

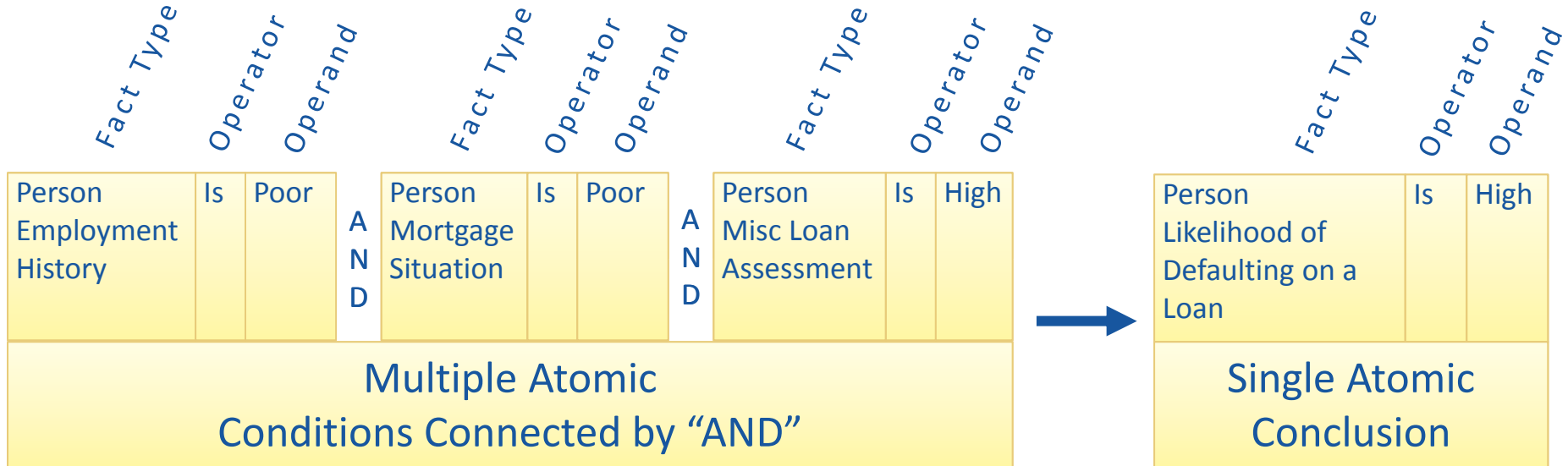


- An atomic piece of business logic
  - Consists of zero to many conditions
  - Leading to a conclusion about one fact type
  - Each condition is an atomic logical expression
  - About an atomic fact type
  - Conditions are ANDed together, never ORed

# What Does Atomic Business Logic Look Like?



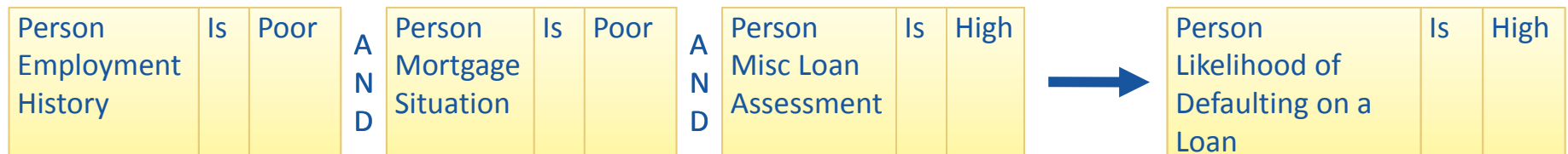
Below is a schematic of a Single Atomic Statement of Business Logic



# The Rule Family – A Way to Represent Multiple Logic Statements



Instead of Multiple Logic Statements that Look Like This:



They May be Represented in Two Dimensional Tables called Rule Families:

Conditions						Conclusion	
Person Employment History		Person Mortgage Situation		Person Miscellaneous Loans Assessment		Person Likelihood of Defaulting on a Loan	
Is	Poor	Is	Poor	Is	High	Is	High
Is	Good					Is	Low
Is	Poor	Is	Poor	Is	Low	Is	Medium

Rule Families are Tables that Conform to Rigorous Principles

# Building Further: Where Do We Get Our Input?



Rule Pattern	Conditions								Conclusion	
	Person Employment History		Person Mortgage Situation		Person Miscellaneous Loans Assessment		Person Outside Credit Rating		Person Likelihood of Defaulting on a Loan	
1	is	Poor	Is	Poor	Is	High			is	High

- Starting with the first condition, we ask where this Fact value comes from. Input from a web page or a file? Is it Persistent data? Is it the result of execution logic?
- In this case we discover that it comes from executing logic that evaluates other business criteria: the business experts want to judge a Person’s Employment History based on criteria such as Person’s Years at Current Employer and Person’s Number of Jobs in the Past Five Years.
- We have to build an additional Rule Family where the conclusion will be “Person Employment History”, a different conclusion to that of our current Rule Family (Rule Family: Business logic grouped by Conclusion.)

# Building Up to Two Rule Families



- Note the Interim Conclusion “Person Employment History”
- We discover the need for yet another Rule Family. This one comes to a conclusion about a Person’s Employment History which is based on two conditions: Person Years at Current Employer and Person Number of Jobs in Past Five Years.

	Conditions				Conclusion	
Rule Pattern	Person Years at Current Employer		Person Number of Jobs in Past Five Years		<b>Person Employment History</b>	

	Conditions						Conclusion			
Rule Pattern	<b>Person Employment History</b>		Person Mortgage Situation		Person Miscellaneous Loans Assessment		Person Outside Credit Rating		Person Likelihood of Defaulting on a Loan	
1	is	Poor	Is	Poor	is	High	?	?	is	High

# Three Rule Families (How do we connect them?)

	Conditions				Conclusion	
Rule Pattern	Person Student Loans		Person Business Loans		<b>Person Miscellaneous Loans Assessment</b>	

	Conditions			Conclusion	
Rule Pattern	Person Years at Current Employer		Person Number of Jobs in Past Five Years		<b>Person Employment History</b>

	Conditions					Conclusion	
Rule Pattern	<b>Person Employment History</b>	Person Mortgage Situation		<b>Person Miscellaneous Loans Assessment</b>	Person Outside Credit Rating		<b>Person Likelihood of Defaulting on a Loan</b>
1	is	Poor	Is	Poor	is	High	? ? is High

The fact types in bold are “dynamic data” so what does this mean?

# Agenda



- 
- The Problem of Business Rules (Logic)
  - Introduction To The Decision Model
  - **Building a Decision Model Step-by-Step**
  - Decisions versus Process
  - The Decision Model, Visualization in Requirements
  - Summary

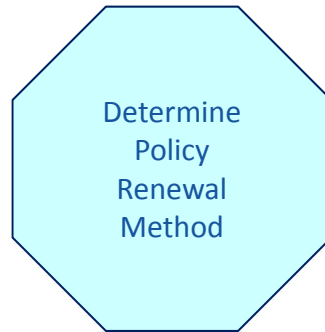
# Every Decision Model Starts with a Business Decision



“**Business decision:** a conclusion that a business arrives at through **business logic** and which the business is interested in **managing.**”

Fact Type	Business Decision
Claim Payment Amount	<u>Estimate</u> the claim payment amount
Claim Payment Eligibility	<u>Determine</u> Claim Payment Eligibility
Customer Likelihood of Loan Default	<u>Determine</u> Customer Likelihood of Loan Default
Insurance Policy Renewal Method	<u>Determine</u> insurance policy renewal method
Inventory Item Minimum Stock Level	<u>Assess</u> the Inventory Item minimum stock level
Loan Prequalification	<u>Determine</u> loan prequalification requirements for a customer
Person BMI (Body Mass Index)	<u>Calculate</u> Person BMI
Vendor Performance Index	<u>Calculate</u> the Vendor Performance Index

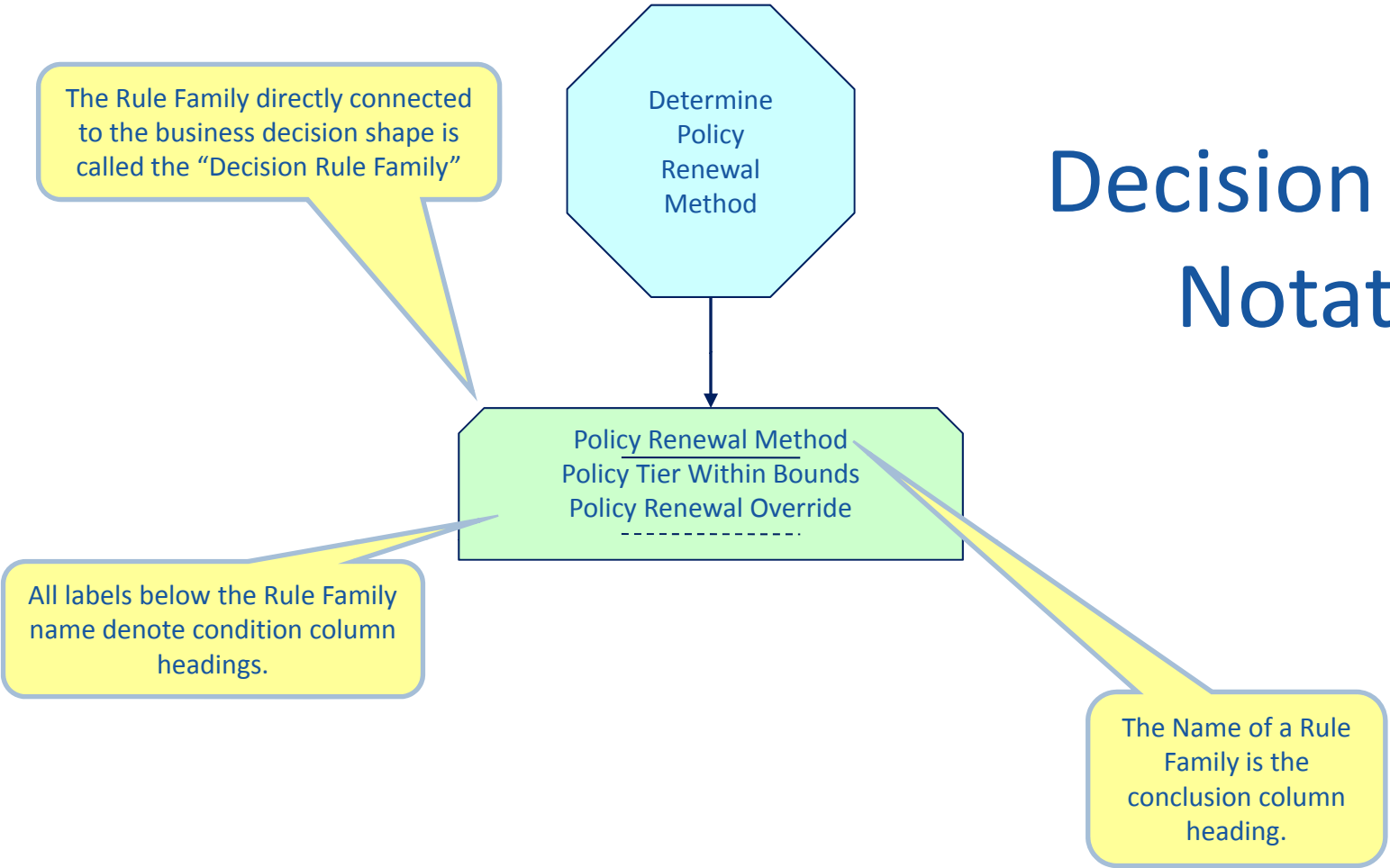
The underlined words (Calculate, Estimate, Determine, Assess, Validate) are “Decision Words”



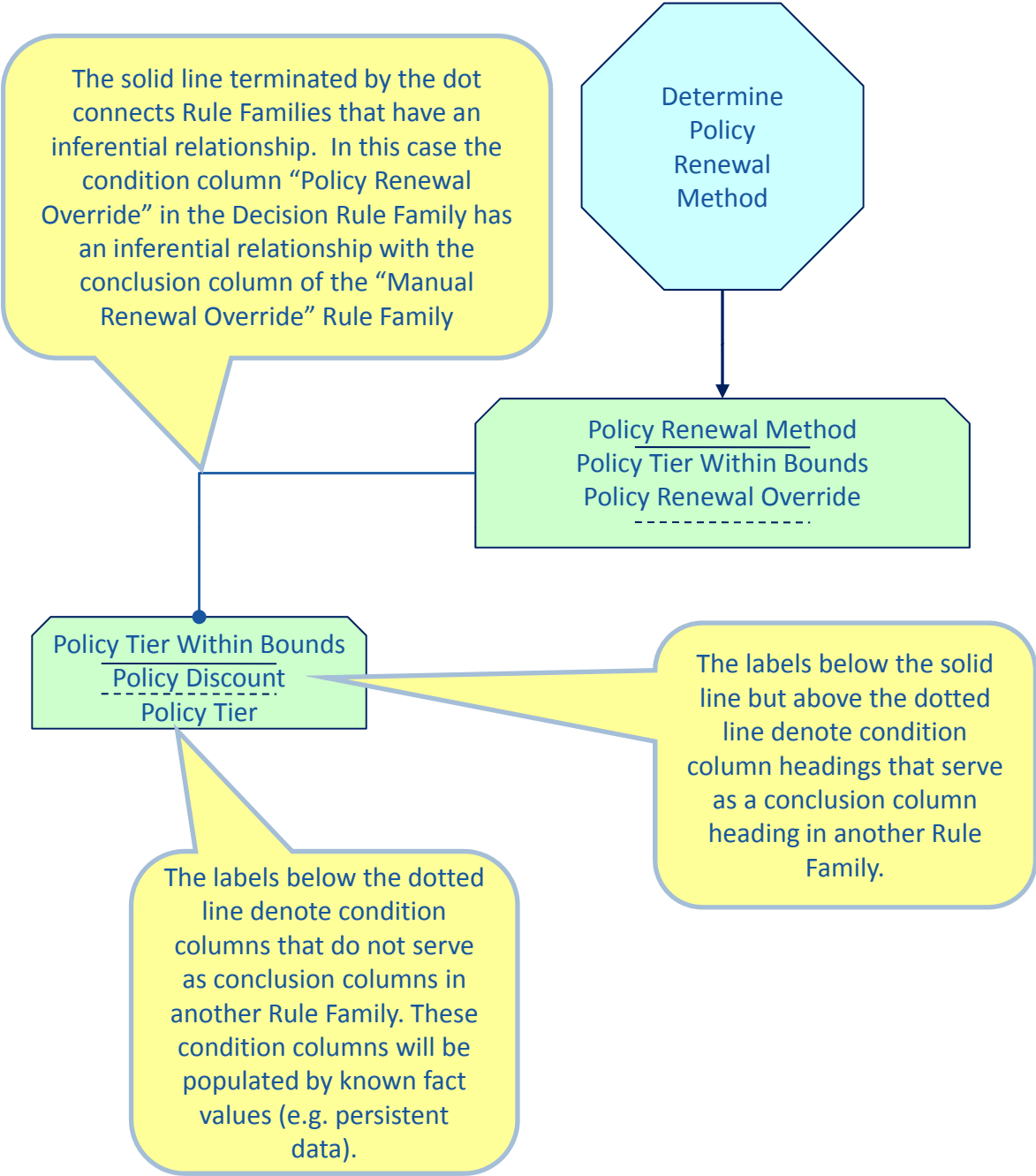
# Decision Model Notation

The Decision Shape denotes the Decision and is named with a Decision word: e.g. Determine, Calculate

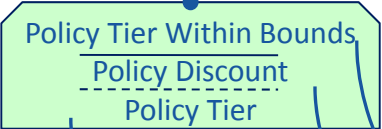
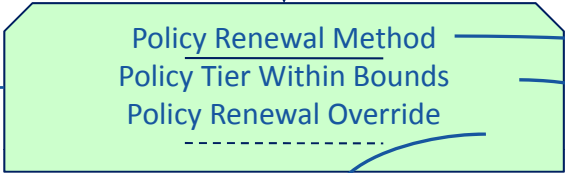
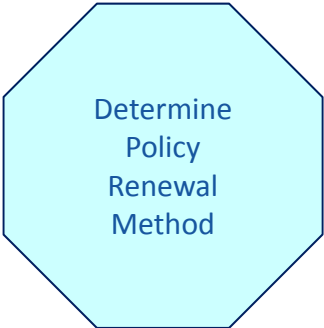
# Decision Model Notation



# Decision Model Notation



# Decision Model Notation



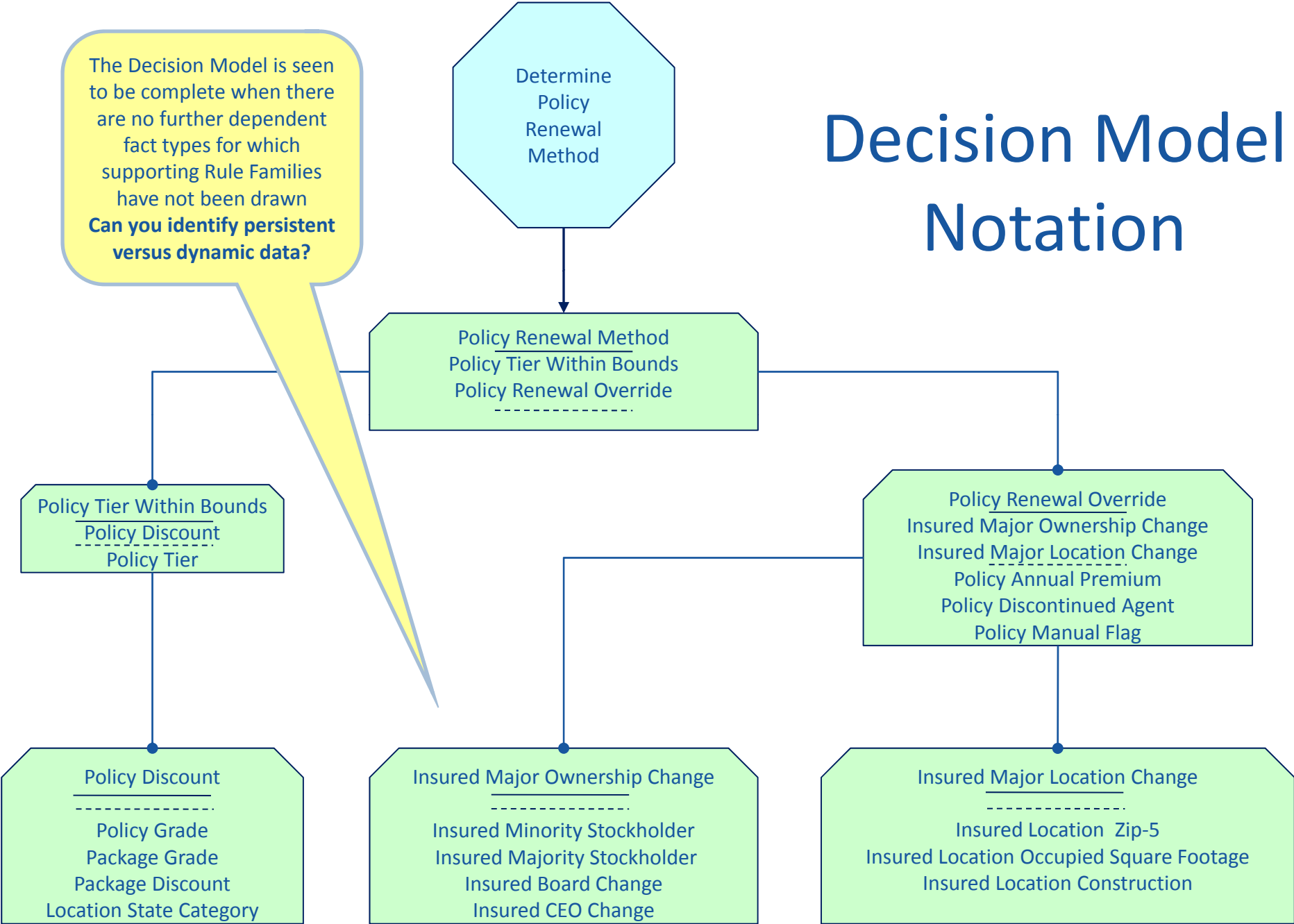
Pattern	Conditions				Conclusion	
	Policy Renewal Override		Policy Tier Within Bounds		Policy Renewal Method	
1	Is	Yes			Is	Manual Renewal Process
2			Is	No	Is	Manual Renewal Process
3	Is	No	Is	Yes	Is	Automatic Renewal Process

Pattern	Conditions				Conclusion	
	Policy Tier		Policy Discount		Policy Tier Within Bounds	
1	≤	1			Is	No
2	≤	1.5	>	10%	Is	No
2	≤	2	>	20%	Is	No
2	≤	2.6	>	22%	Is	No
2	>	1	≤	0%	Is	Yes
2	>	1.5	≤	20%	Is	Yes
2	>	2	≤	22	Is	Yes
1	>	2.6			Is	Yes

This diagram shows graphically how the Rule Family shapes depicts the Rule Families themselves an

# Decision Model Notation

The Decision Model is seen to be complete when there are no further dependent fact types for which supporting Rule Families have not been drawn  
**Can you identify persistent versus dynamic data?**



# Decision Model Principles



- Structural Principles – Structural simplicity
- Declarative Principles – Declarative structure
- Integrity Principles – Optimal logical integrity

These Principles ensure that each row, each pattern and each family has business and logical integrity: this means that the business purpose has been understood and aligned, and that there is no logical error in the logic, and that there is no conflict or duplication in the logic. The Principles introduce Normalization.

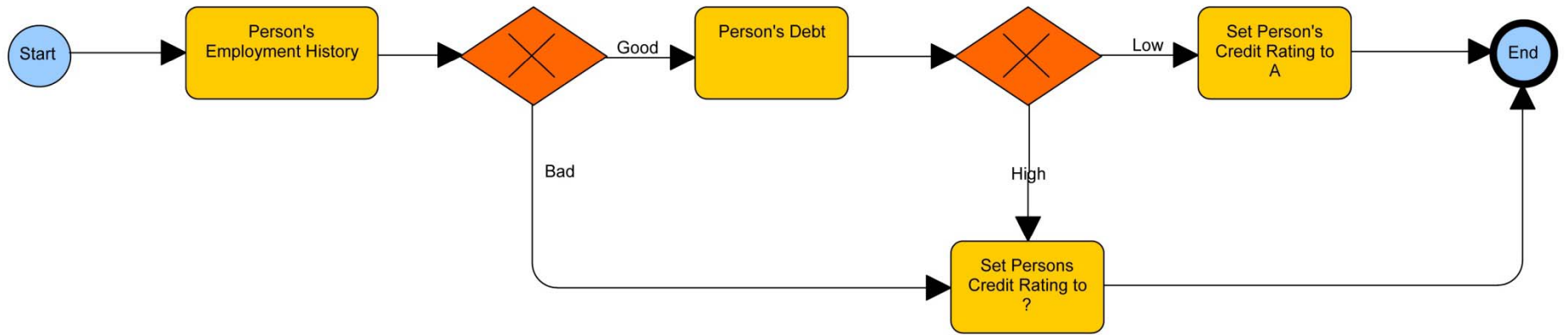
# Agenda



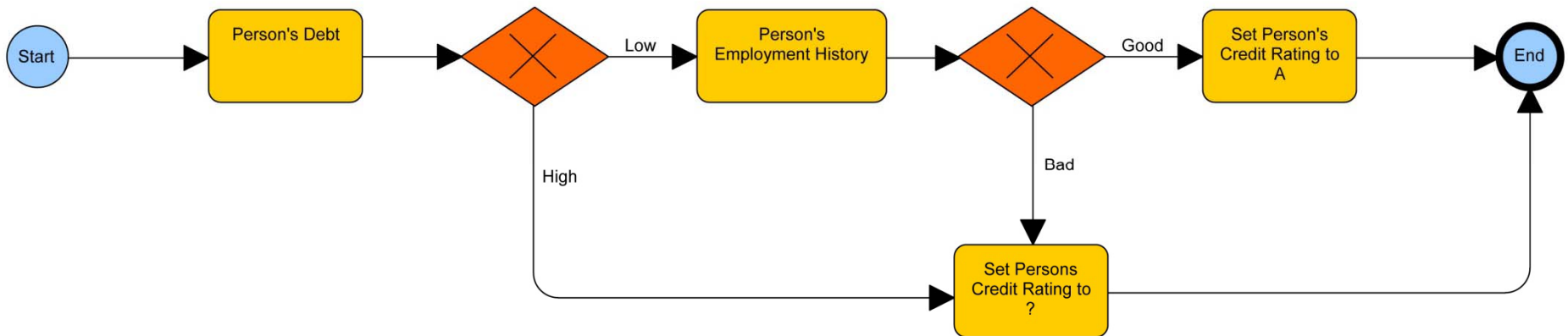
- 
- The Problem of Business Rules (Logic)
  - Introduction To The Decision Model
  - Building a Decision Model Step-by-Step
  - **Decisions versus Process**
  - The Decision Model, Visualization in Requirements
  - Summary

# Distinguishing Decisions from Process

Option 1



Option 2



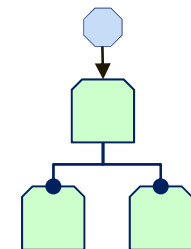
Option 3



Process Model

Rule Pattern	Conditions				Conclusion	
	Person's Debt		Person's Employment History		Person's Credit Rating	
1	is	Low	is	Good	=	"A"
1	is	Low	is	Bad	=	?
1	is	High	is	Good	=	?
1	is	High	is	Bad	=	?

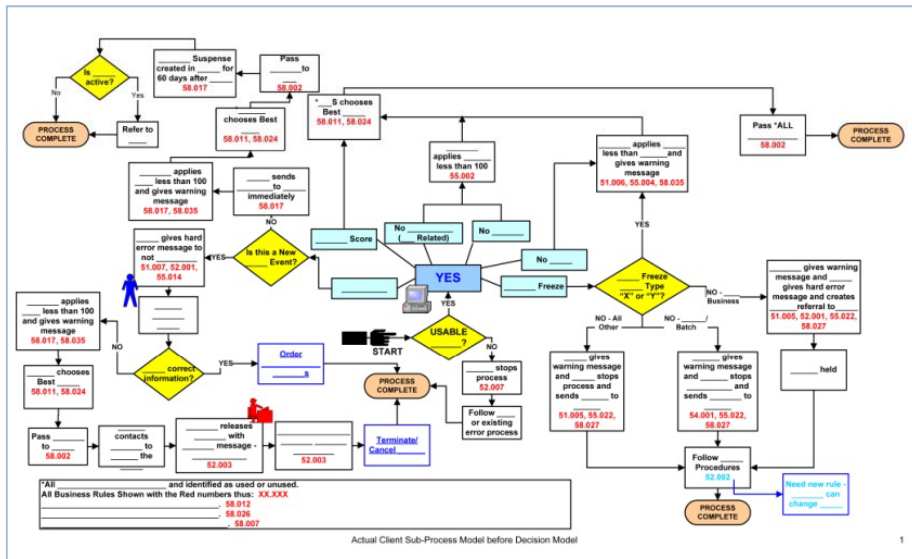
Rule Family Table



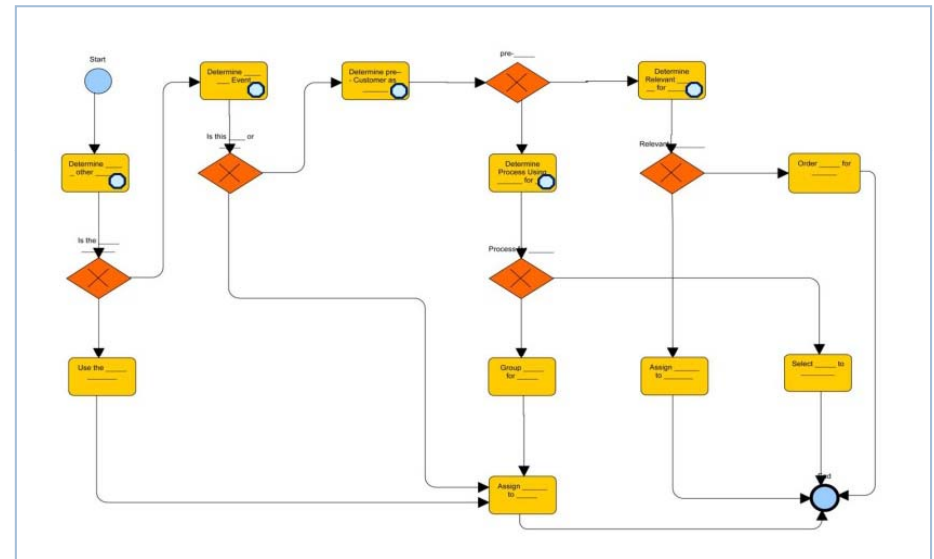
Decision Model Diagram

# Simplify the Models, Improve the Solution

Before



After



# Agenda



- 
- The Problem of Business Rules (Logic)
  - Introduction To The Decision Model
  - Building a Decision Model Step-by-Step
  - Decisions versus Process
  - **The Decision Model, Visualization in Requirements**
  - Summary

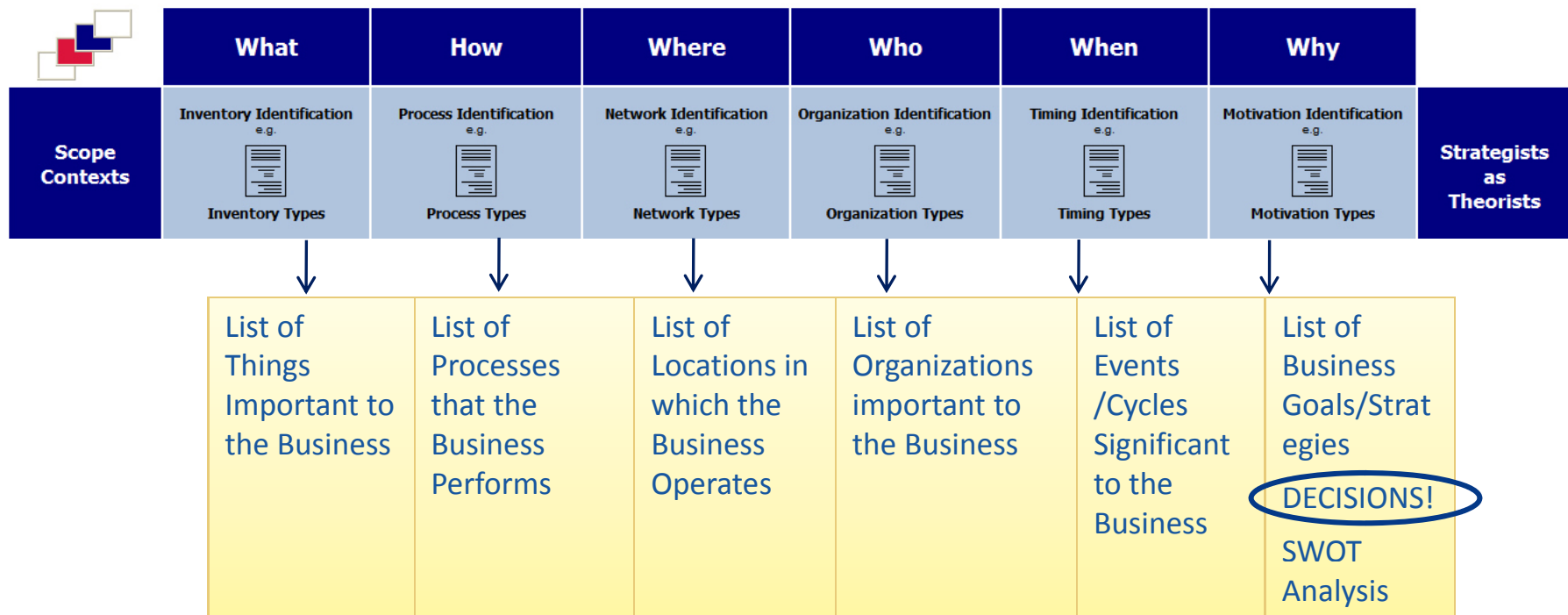
# *FirstSTEP*



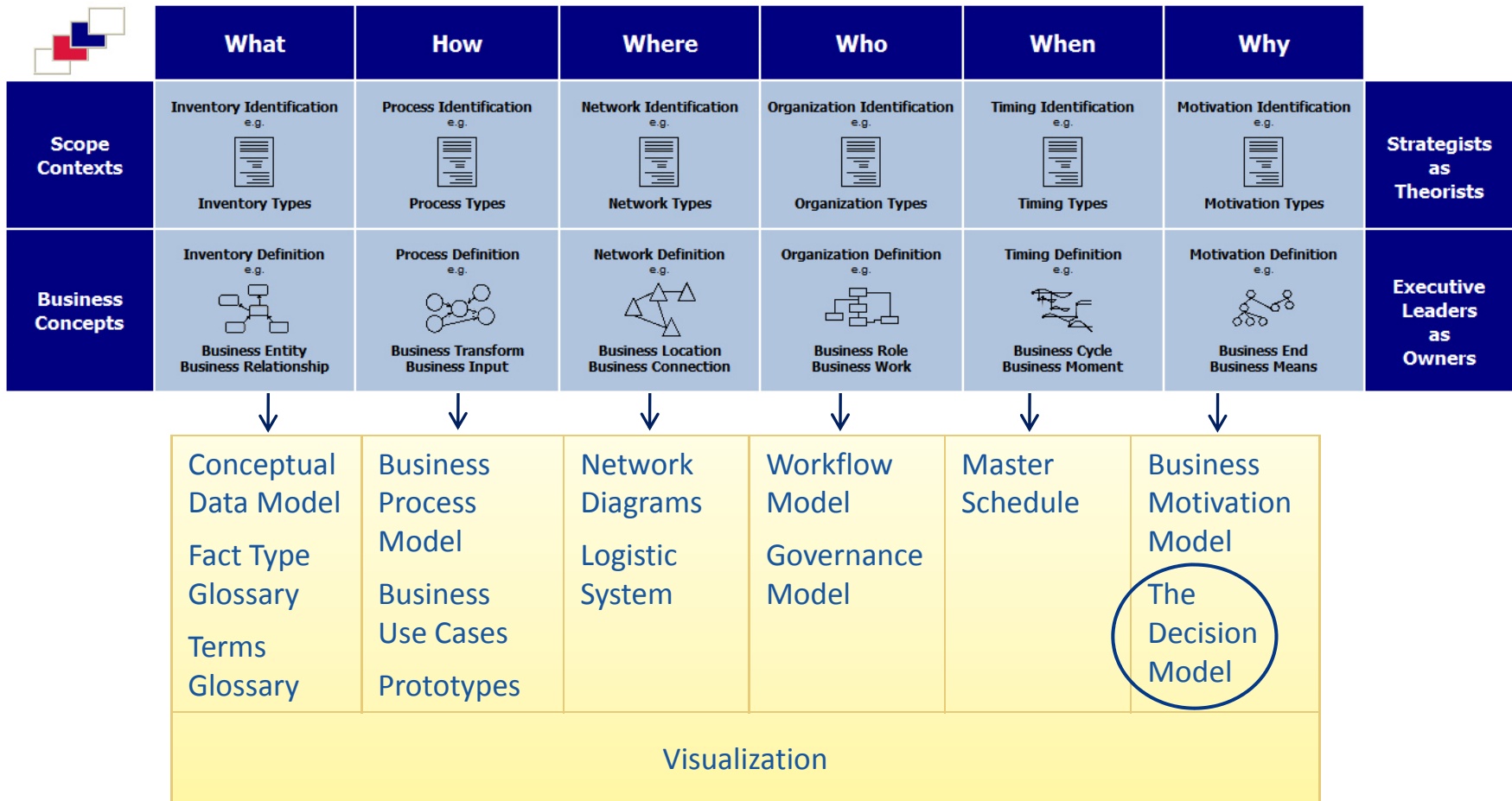
- 
- Step1: Scope
  - Step2: Selection and First Iteration of Models
  - Step3: Visualization
  - Step4: Iterate the Models (Until Complete)
  - Step5: Finalize the Requirements

# FirstSTEP Scope

- Review the Project Charter
- Use the framework to create scope:



# FirstSTEP Models



# Application Visualization

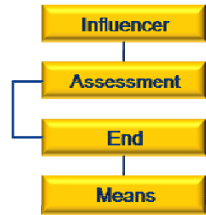


- Business analysts, product managers & UE professionals assemble simulations of possible solutions
- Business and IT stakeholders “test drive” & provide feedback in rapid, interactive explorations
- Discussions are more focused & engaging
- Visualization dramatically improves communication between business & IT

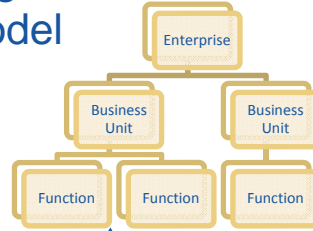
# Problems Solved using Visualizations



Business Motivation Model

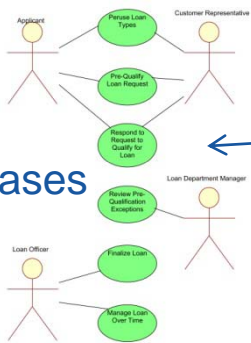


Organization Model

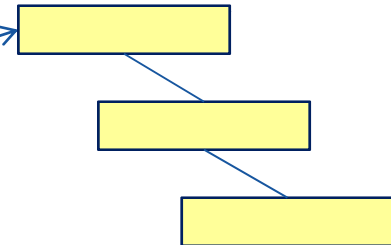


The Decision Model has produced requirements faster, incrementally, and with unprecedented agility

Use Cases

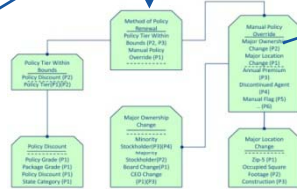


Vocabulary Models:  
Glossary/Semantic Model  
Logical Data Model  
Object Model

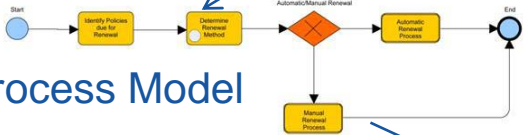


Decision Model:

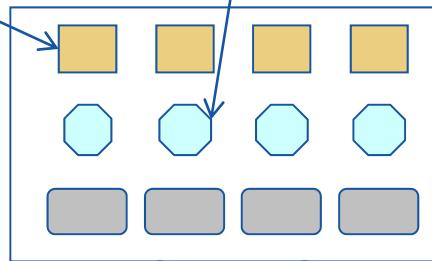
business rules and business logic



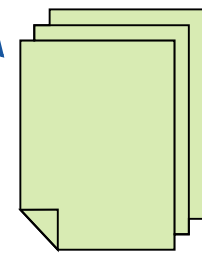
Process Model



SOA Components



Business Requirements & Test Cases



# Agenda



- 
- The Problem of Business Rules (Logic)
  - Introduction To The Decision Model
  - Building a Decision Model Step-by-Step
  - Decisions versus Process
  - The Decision Model, Visualization in Requirements
  - **Summary**

# Real World



- “The Decision Model’s principles and normalization rules give us confidence we can get repeatability and consistency amongst business analysts when performing rules analysis.
- In addition, the structural integrity of the Decision Model makes the technology implementation straightforward
- IT and Operations have agreed to use our decision model as business requirements for business logic changes – this will greatly speed up the change process
- In addition, the use of a COTS BRMS solution will allow us to take advantage of additional capabilities over time, such as enhanced testing and decision-warehousing capabilities.”

*Mark Pettit, Freddie Mac, Operations Management Group, MITIQIS, July 15, 2010*

# The Future is Here



- 
- Requirements and Modeling Support
    - eDev
    - RuleGuide
    - More?
  - Automation Support
    - BRMS
    - Open Rules
  - Standards
    - OMG DMN Group

# Learning Objectives:



- 
- Separate and model business logic (rules) as the missing piece in requirements
  - Recognize that business logic (rules) has its own structure and integrity different from other modeled assets.
  - Create a Decision Model following a step-by-step agile and iterative approach
  - Integrate The Decision Model and Visualization with Requirements

# How to Learn More



- Log in to the KPI Website to:
  - Review the White Paper on requirements, a free download on the web site
  - Review The Decision Model Primer, a free download on the web site
  - Check Events for upcoming public training
  - Conduct a 2-3 week pilot (KPISTEP)

[www.KPIUSA.com](http://www.KPIUSA.com)