Linking Business with Technology

KPI's solution to transforming the Enterprise using The Decision Model

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Agenda

- **The Problem of Business Logic**
- A Brief Introduction to the Decision Model
- Impact on Business Analysis
- Recent Advances in The Decision Model
- Wrap-up

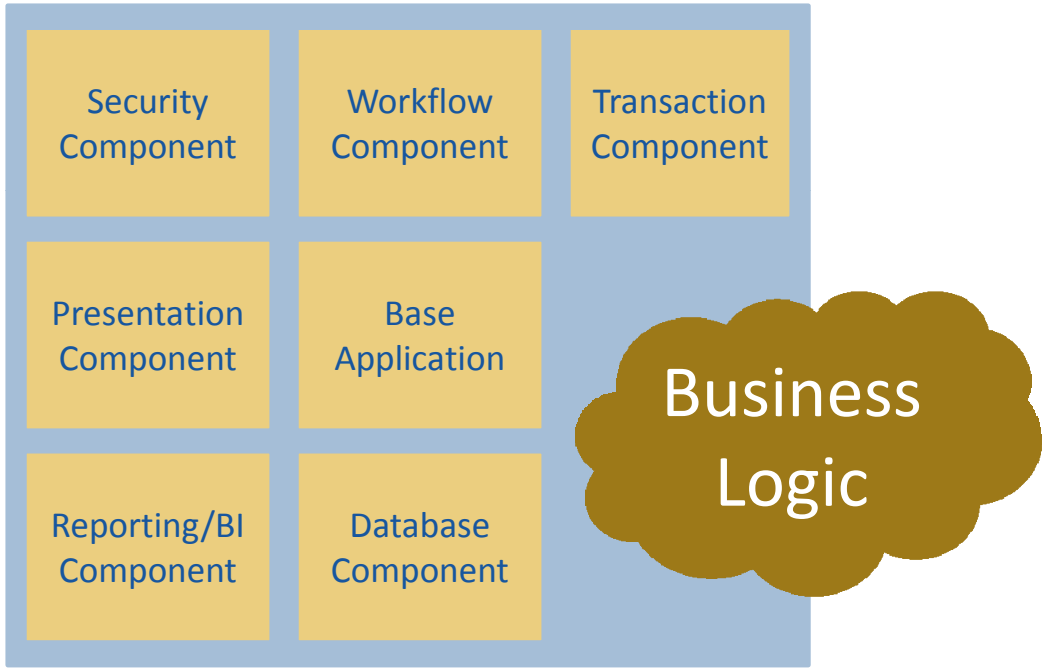
“Big Ball of Mud”

Foote & Yoder

Separation of Concerns

Component Based Application Architecture

Ken Orr



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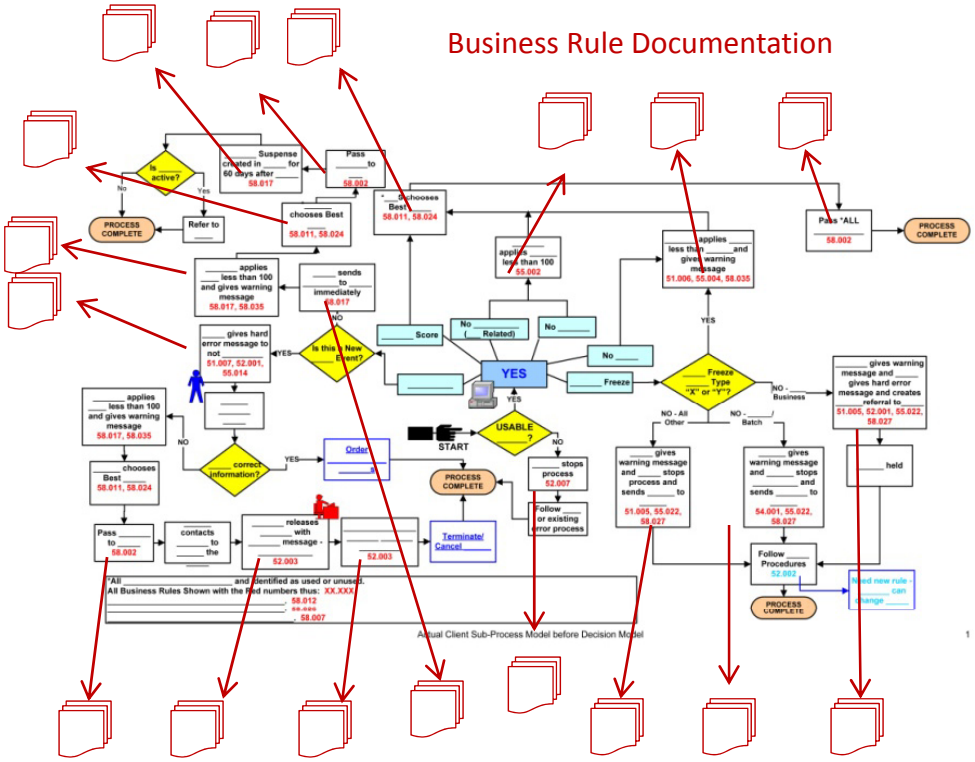
Business Logic



Business Process Model

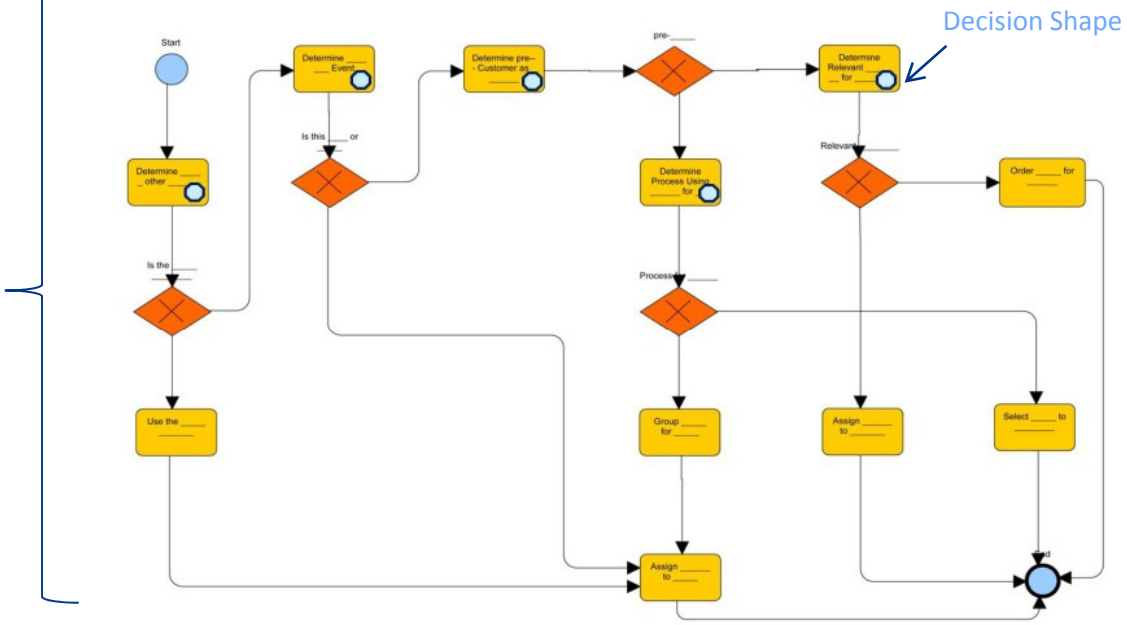
Expressing procedural (how) and declarative (what) elements in one model leads to increasingly complex and unmaintainable artifacts with a declining value for Business and Technology stakeholders

Business Logic

By separating the procedural from declarative elements The Decision Model simplifies Business Process Models.

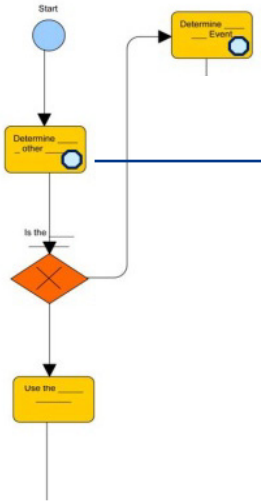
How

Business Process Model

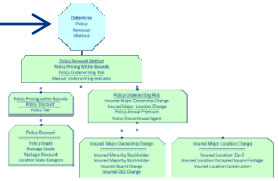


Business Logic

All the logic is contained in a model that more accurately reflects logic, and enables the logic to be more easily and accurately maintained



What



Decision Model

Policy Renewal Method
Policy Pricing Within Bounds
Policy Underwriting Risk
Manual Underwriting Indicator

Rule Family

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 Family Table

A person has a poor employment history → A person is highly likely to default on a loan

Atomic Logic Statement

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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

The Rule Family – A Way to Represent Multiple Logic Statements

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Instead of Multiple Logic Statements that Look Like This:

Person Employment History	Is	Poor	AND	Person Mortgage Situation	Is	Poor	AND	Person Misc Loan Assessment	Is	High	→	Person Likelihood of Defaulting on a Loan	Is	High

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

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Building Further: Where Do We Get Our Input?

	Conditions								Conclusion	
Rule Pattern	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	**Person Employment History**

	Conditions						Conclusion	
Rule Pattern	**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

Decision Model Principles

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

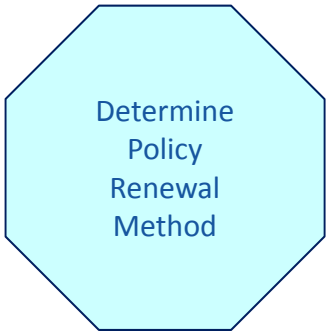
These Principles ensure that each row, each pattern and each family has business and logical integrity: this means that the business purpose has been understood and aligned, and that there is no logical error in the logic, and that there is no conflict or duplication in the logic. The Principles introduce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

Every Decision Model Starts with a Business Decision

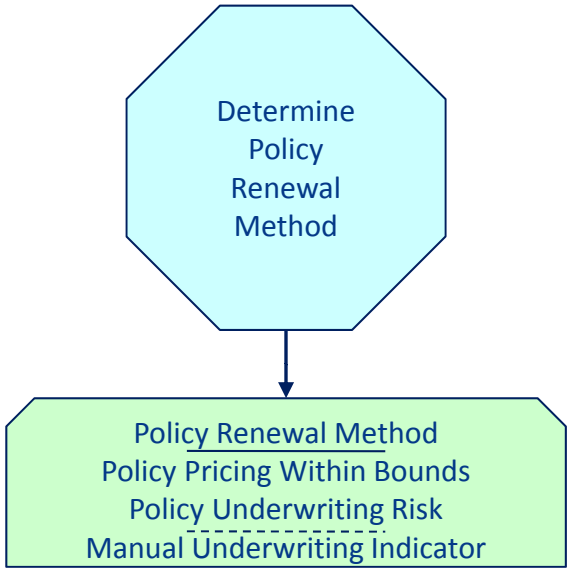
"**Business decision**: a conclusion that a business arrives at through **business logic** and which the business is interested in **managing**."

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

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



Decision Model Notation



Decision Model Notation

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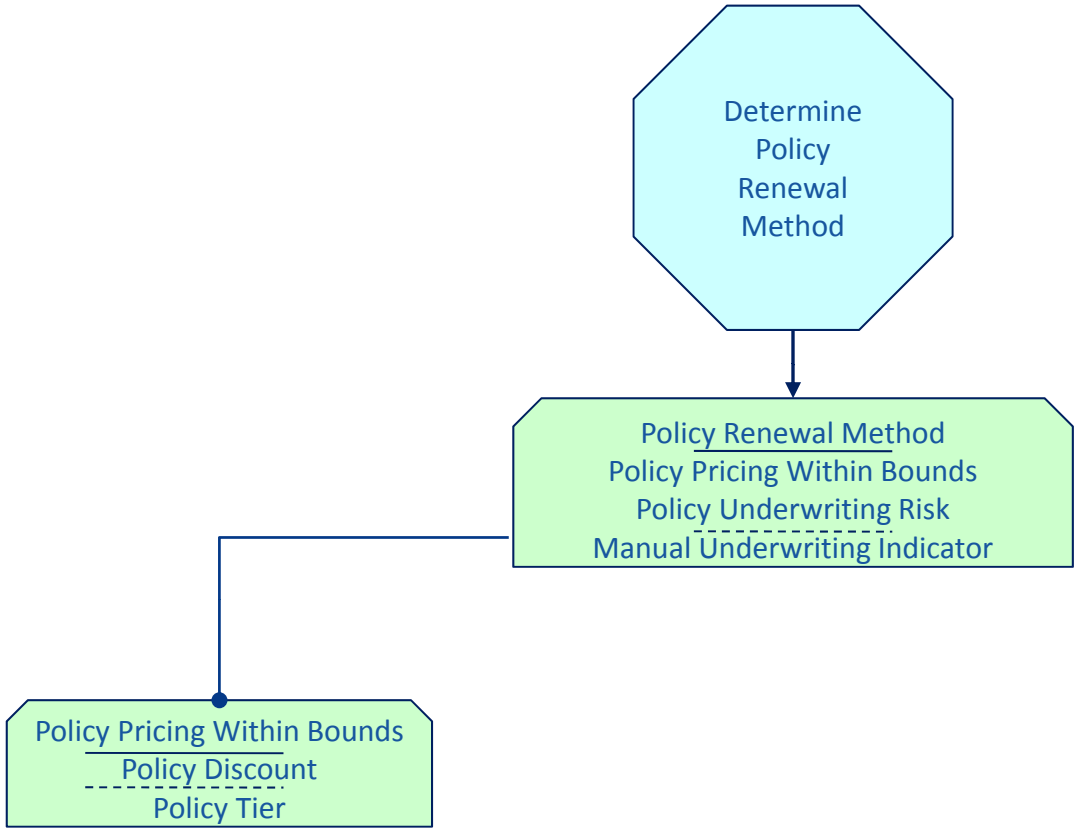

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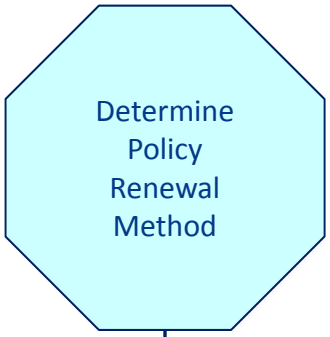

Policy Renewal Method
Policy Pricing Within Bounds
Policy Underwriting Risk
Manual Underwriting Indicator

	Conditions						Conclusion	
Pattern	Policy Underwriting Risk		Policy Pricing Within Bounds		Manual Underwriting Indicator		Policy Renewal Method	
1	Is	Unacceptable					Is	Manual Renewal Process
2			Is	No			Is	Manual Renewal Process
3					Is	On	Is	Manual Renewal Process
4	Is	Acceptable	Is	Yes	is	Off	Is	Automatic Renewal Process

Policy Pricing Within Bounds
Policy Discount
Policy Tier

	Conditions				Conclusion	
Pattern	Policy Tier		Policy Discount		Policy Pricing 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

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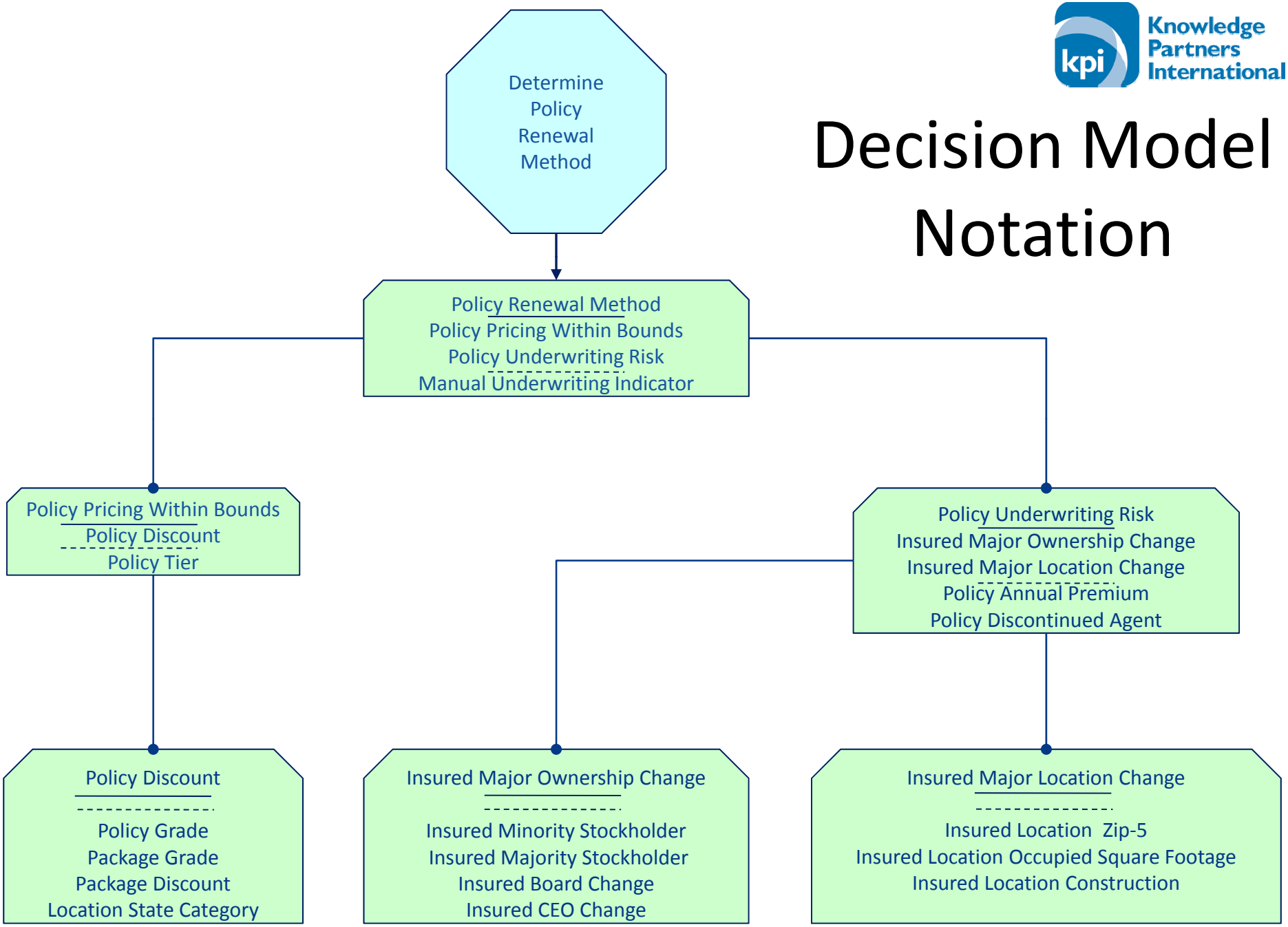
Decision Model Notation



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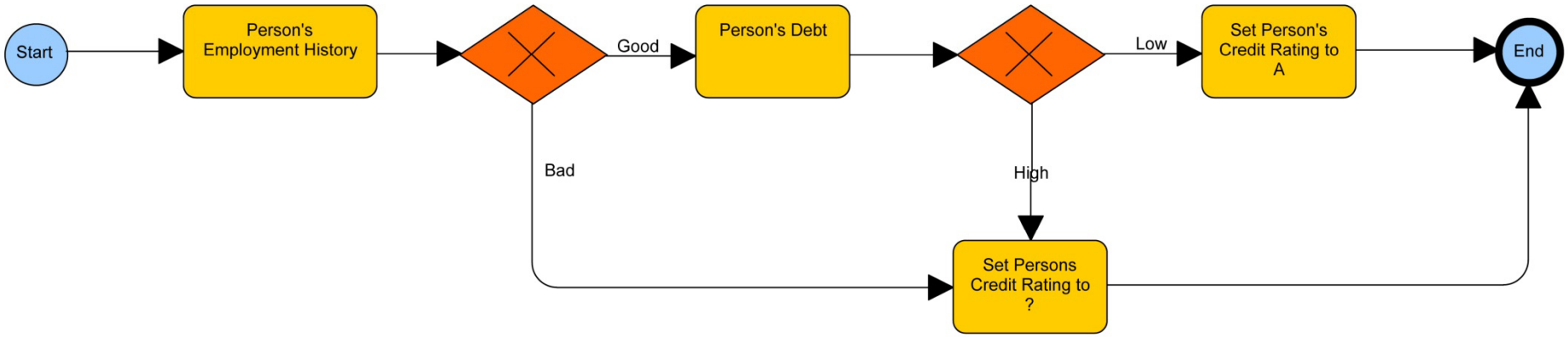
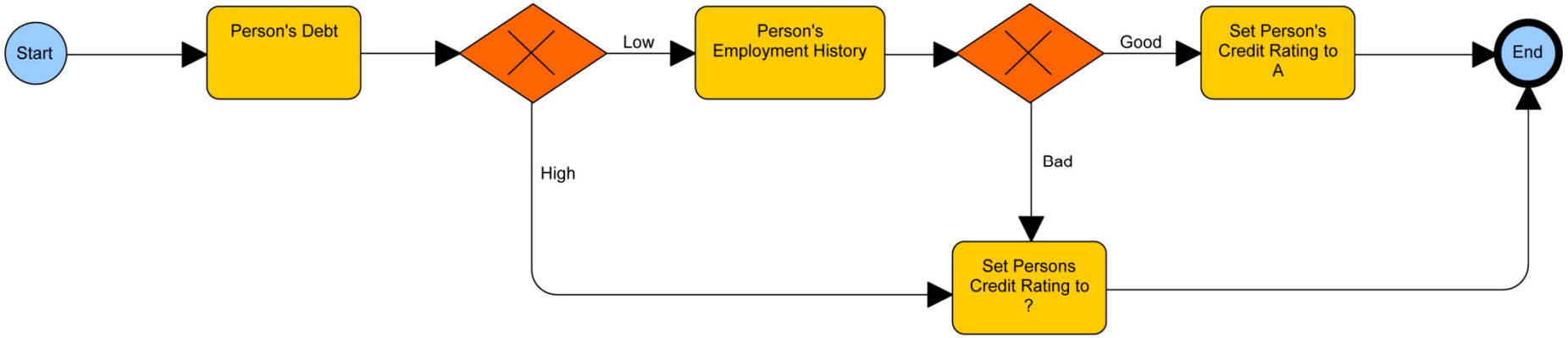
Distinguishing Decisions from Process

Option 1

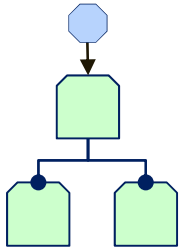


Option 2



Option 3

	Conditions				Conclusion	
Rule Pattern	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	=	?



Process Model | Rule Family Table | Decision Model Diagram

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Simplify the Models, Improve the Solution

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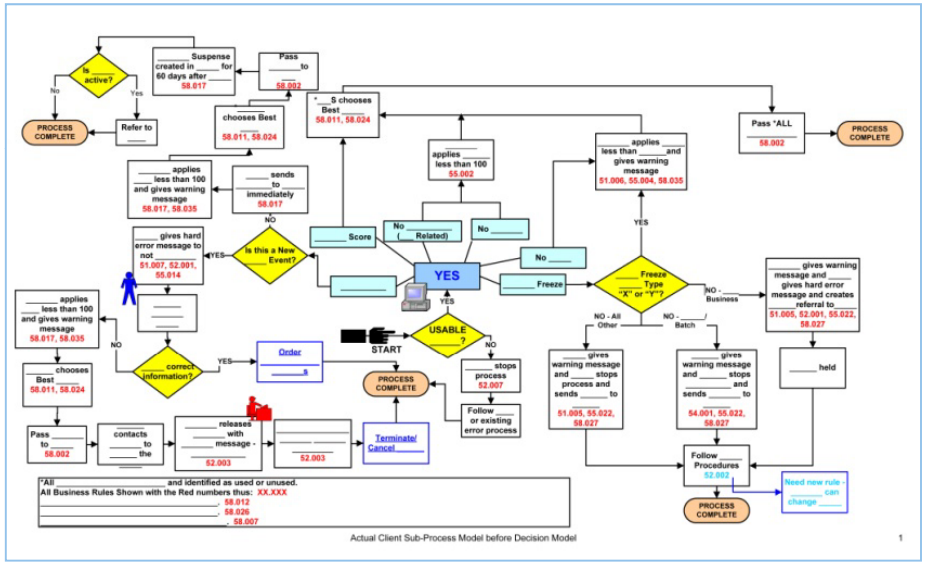
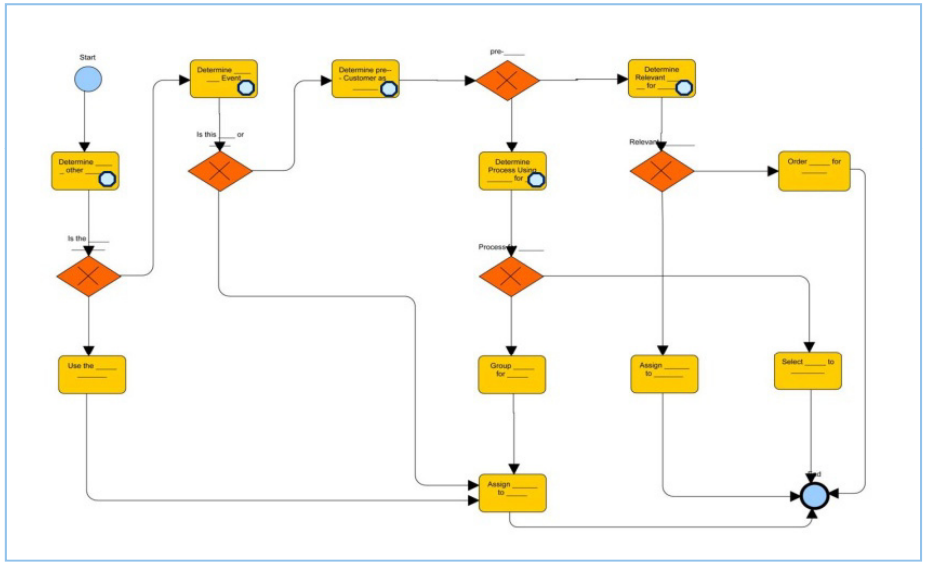
Before



After



The Business Decision Maturity Model (BDMM)

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Level 0 Unmanaged	Level 1 Visible	Level 2 Agile	Level 3 Aligned	Level 4 Predictive	Level 5 Autonomic
MINIMUM	**BUSINESS VALUE**				**MAXIMUM**
Risk of loss of business control is high. Risk of business change is high. Ability to predict business impact of change is low. Cost of change is high.	Risk of loss of business control and business change is lower. Cost of change is lowered. Ability to predict business impact of change is still low. Analysis of business decisions is possible, but is manual.	Risk of loss of business control greatly reduced at the project level; business change becomes possible through automated analysis. Ability to predict business impact of change is still low.	Risk of loss of business control greatly reduced across projects. Ability to predict business impact of change is improved. Consistency between business units improved. Cost of change and testing reduced further.	Firm control of business policy established. Ability to predict short-term futures, ability to assess the impact of change on the future is possible.	Optimize business policy to changing conditions in real time and against predicted changes in business models and metrics Management focus on evolving business ojectives and policy with a firm business control; birth of the Agile Enterprise.
IMMATURE	**BUSINESS ARCHITECTURE**				**MATURE**
No business architecture; no business architecture to speak of.	Informal Business Decision Management architecture.	Project level process and business decision standards established within broarder architectural standards.	Cross project level process and business decision standards defined with broarder architechtural standards.	Detailed standards for process and Business Decision Architecture established and managed.	Continuous improvement of process and Business Decision architecture with the broarder architectural process.
NOT PRESENT	**BUSINESS STEWARDSHIP**				**ENTERPRISE**
No stewardship.	Business Analysts lead business decision discovery for local locigal development.	Inegration of Business Decisions with use cases and process flows with business metrics.	Stewardship of business process and Business Decisions across project boundaries.	Stewardship of business process and Business Decisions at enterprise levels.	Full integration of process and Business Decision Management into business planning.

DECISIONS SHARED ACROSS: <-- PROJECT LEVEL ONLY --> <---- PROJECTS ----> <---------- ENTERPRISE---------->

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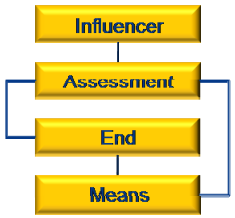
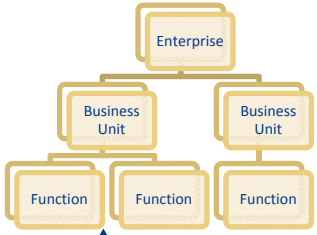
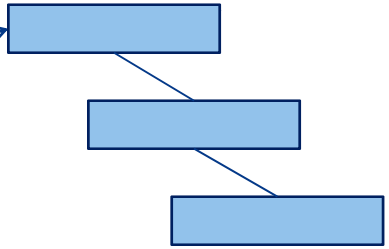
Organization Model

Business Motivation Model

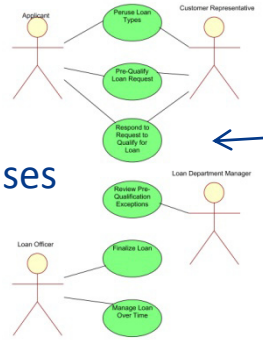




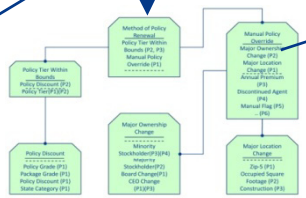
Vocabulary Models:
Glossary/Semantic Model
Logical Data Model
Object Model



Use Cases

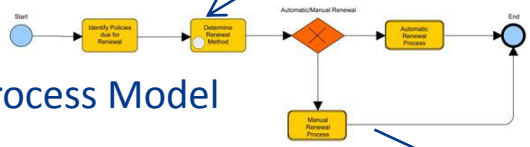


Decision

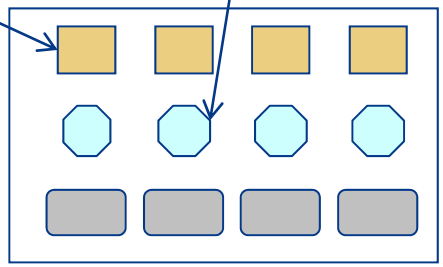


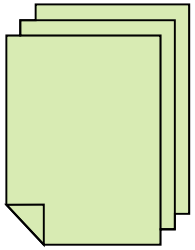
Decision Model:
business rules and
business logic

Process Model



SOA Components





Business Requirements & Test Cases

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Recent Advances in the Model and Practice

- Decision Model Views
  - Mass Customization: Geographical, political, glossary, customer-based
- Codeless implementation into BRMS
- The Decision Model Data Quality Framework
- The Decision Model for Data Translation Services
- Decision Model Messaging
- Testing and Generation of Test Cases

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."
- From policy to automation reduced by 30% in time, while delivering 66% more changes

Mark Pettit, Freddie Mac, Operations Management Group, MIT IQIS, July 15, 2010

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Next Steps

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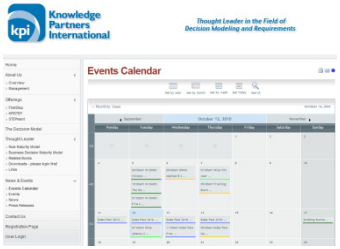

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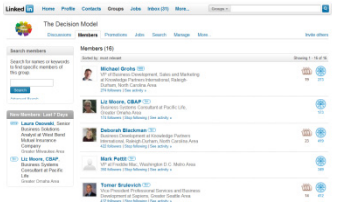

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Discuss with us how to apply The Decision Model for your Requirement or Business Rules project.

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