The Decision Model – June 2011
Breaking Barriers in Real-World Projects

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Barbara von Halle and Larry Goldberg explore three real-world projects to illustrate how organizations are successfully using decision models to solve a range of business challenges.

The number of successes with The Decision Model is escalating. Organizations are using The Decision Model to solve a range of business challenges and opportunities, including some we did not expect. Therefore, this month we summarize three real world projects to illustrate how organizations are using decision models and how quickly project teams are delivering them.

It is important to remember that organizations classify most decision models as proprietary because they contribute to organizational excellence, differentiation and risk management. For this reason, the project summaries do not disclose the industry or organization for which the decision models were created. Nor do they reveal actual process models or decision models. The value of these summaries is that the characteristics of each project are common across all industries. You will learn the following about each project: (1) the business motivations justifying a decision model, (2) the numbers and sizes of actual decision model deliverables, (3) unique challenges, (4) elapsed time to delivery, (5) measurement of business impact, and (6) lessons learned.

The first two projects involve eligibility and compliance decision models.

Eligibility and Compliance Decisions are Everywhere

Eligibility and compliance decisions are prevalent in all industries and represent the majority of most organizations' decisions. They are a perfect fit for decision models. Eligibility is the state of being qualified or entitled to something while compliance is the state of adhering to a standard. Below, we use the words eligibility and compliance interchangeably because they often correspond. For example, if a claim is deemed not *compliant* with the subscriber's health care plan, the claim is not *eligible* for payment.

Industry Examples

The insurance industry makes *eligibility* decisions hundreds – if not thousands – of times a day to determine whether a claim is eligible for payment. Each individual claim may have a low economic impact on the insurer, but the huge volume of claims means that these eligibility decisions have a high economic impact on the insurer.

An insurer makes *eligibility* decisions to determine whether the dependent of a subscriber is eligible for membership in the subscriber's plan, usually based on the dependent's relationship to the plan subscriber, the dependent's age, whether or not the dependent is disabled and other conditions.

The academic industry makes *eligibility* decisions to determine whether to accept a student into the institution and to determine whether a student qualifies for financial aid. Different conditions may apply to different kinds of financial aid programs – some conditions for loan eligibility, some for scholarship eligibility, and others for participation in work-study programs.

The financial industry makes *eligibility* decisions to determine whether a customer qualifies for a specific kind of loan with specific terms. When the volume and monetary amount of loans are high, these decisions stand behind huge amounts of borrowed money.

The logic of eligibility and compliance can be quite complex, but sometimes is simple. We begin with the characteristics of a simple eligibility decision before looking at a real world project that is more complex.

A Simple Eligibility Decision

A simple eligibility or compliance decision is one whose logic fits within a decision model containing only one Rule Family[1], as **Figure 1** illustrates. The conclusion fact type is the kind of eligibility - in this case, a dependent's eligibility to enroll in a subscriber's plan. This decision has recently undergone regulatory change.

Figure 1 shows three condition fact types leading to the conclusion: dependent relationship to subscriber, dependent age, and dependent disability status.

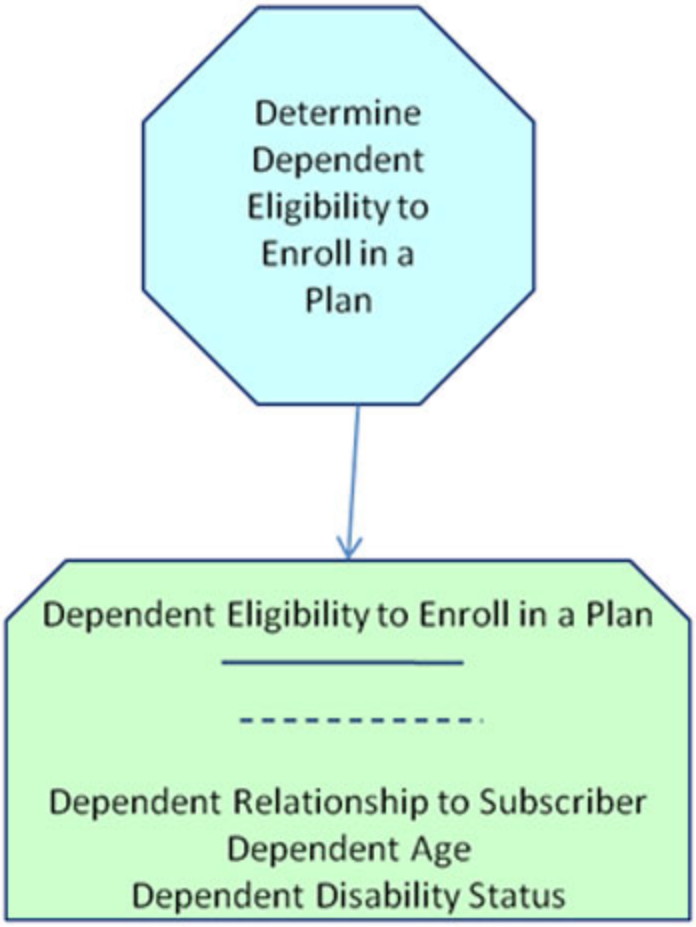


Figure 1: Decision Model for Simple Eligibility Decision-One Rule Family

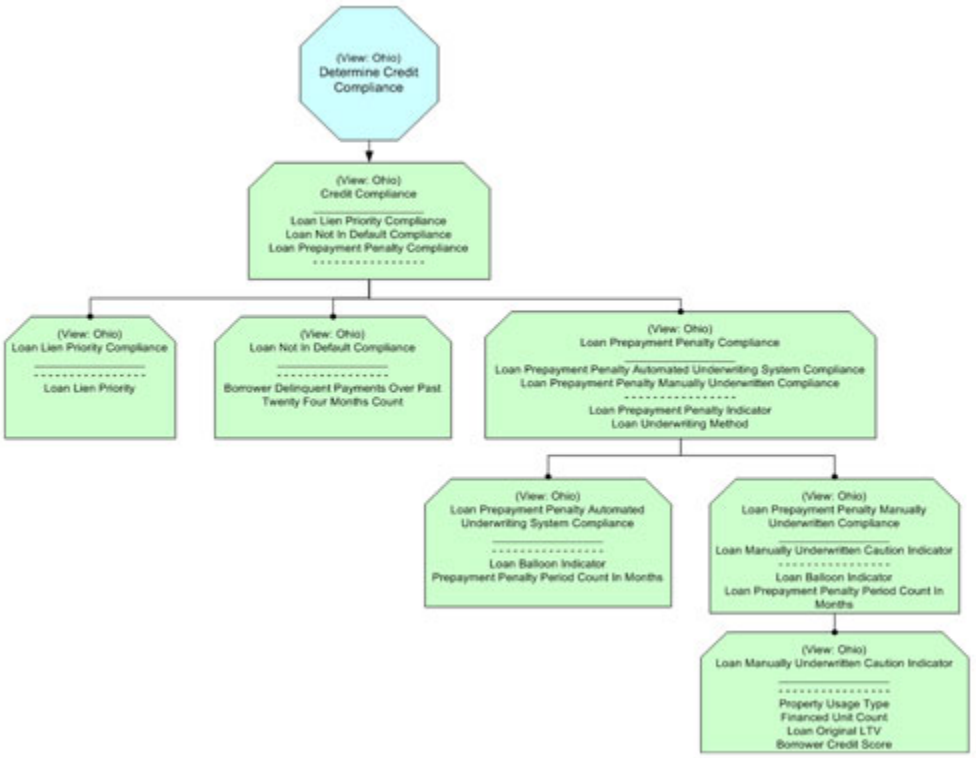
Table 1 illustrates a partially populated Rule Family table for this decision. There are two Rule Patterns. The "…" indicates that the Rule Family is not yet completely populated because it must consider other kinds of dependent relationships to subscriber.

Row ID	Rule Pattern	Conditions			Conclusion
		Dependent Relationship to Subscriber	Dependent Age	Dependent Disability Status	Dependent Eligibility to Enroll in Plan
	1	Child	Younger than 26		Eligible
	2	Child	Older than 26	Handicapped	Eligible

Table 1: Simple Eligibility Decision-One Rule Family

Project #1: A Medium Complexity Eligibility Decision

In most cases, eligibility or compliance logic is too complex to fit into a single Rule Family. If the logic is of medium complexity, it fits into a set of dependent Rule Families, some related to others. **Figure 2** illustrates a fictitious example from the Mortgage Industry consisting of seven Rule Families and leading to the Credit Compliance conclusion.



Project #1 is a real-world example of a medium eligibility decision.

Description: The purpose of the project was to specify the logic for one eligibility decision. The logic existed in policy documents and program code.

Motivations: The organization wanted to represent the logic in a way that business people could understand. The organization also wanted to decrease the time it takes to analyze and automate changes in the logic.

Deliverables: The first deliverable was a preliminary decision model diagram similar to that in Figure 2, followed by populated Rule Family tables and a glossary. The final decision model consisted of 12 Rule Families and 24 fact types. A customized view of that decision model consisted of 7 Rule Families.

Challenges: The first (and common) challenge was that the project team had no experience with decision modeling. The project began with training and was led by an experienced decision modeler. A second challenge was that the policy documents provided only half the story – logic only for “ineligible” conditions. The team

constructed the remaining combinations of logic and business people validated that each combination represented an “eligible” conclusion. A third challenge was that some of the data for the customized view was not available, so that the customized decision model view was not deployable until the organization obtained the data.

Time to Delivery: The team completed the first decision model in 38 hours and the customized view in five hours.

Business Impact: Business people immediately were active in specifying the business logic and analyzing it because they could see and understand it. The decision model decreased the time for making changes and putting them into production. The business people continue to play a key role in guiding these changes.

Lessons Learned: The team revealed 3 lessons from this experience. First, the glossary is critical to productivity. Second, creating decision model views for customized situations can be fast. Third, populating Rule Families according to normalization principles takes discipline, but is well worth it.

Project #2: Highly Complex Eligibility Decision

In the most complex eligibility decisions, each aspect of eligibility becomes a whole decision model by itself. Specifically, each aspect stands alone, unrelated to other aspects of the eligibility decision. A task box in the process model contains the entire group of decision models needed for the eligibility decision. See **Figure 3**.[2] As a fictitious example from the Financial Industry, there are four decision models, each for a different aspect of customer credit eligibility but unrelated to each other.

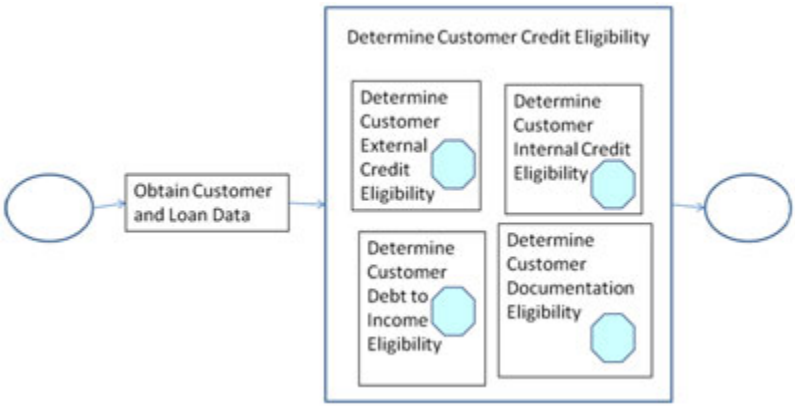


Figure 3: Complex Eligibility Decision Requiring Multiple Whole Decision Models

Complexity of Decision	Size of Decision Models	Time to Deliver Process Models and Fully Populated Analyzed Decision Models in 3rd Normal Form

Simple	1 decision model 1 Rule Family 10 fact types	Few hours to days
Medium	1 decision model 1 customized view 12 Rule Families 24 Fact Types	43 hours
High	12 decision models 6 customized views for some 90 Rule Families	3 months
High	40 decision models 700 Rule Families 1400 Fact Types	3 months
Medium	5 decision models 95 Rule Families (one decision model with 89 Rule Families) 220 Test Cases	5 weeks

Table 2: Summary of Decision Complexity, Size, and Development Times

Breaking barriers is good, especially when the barriers are productivity improvements, solutions to difficult business challenges, and measurable business impact.

The productivity gains related to creating decision-aware processes and decision models exceed expectations on *every* project, making decision modeling the fastest approach we (and others) have ever experienced. Specific productivity gains occur in the following areas:

- Creation of initial process and decision model deliverables
- Analysis of decision logic against decision model principles
- Generation of test cases and testing entire decision models, reducing testing efforts by 50%[3]
- Automation of decision models and straight-through processing

Experience continues to prove that the decision model is appropriate for many situations it was never meant to address. It has been the preferred solution, and sometimes the only solution, to the following kinds of business challenges:

- Pure business decision logic
- Data quality logic
- Data transformation logic
- Complicated interpolation and calculation logic
- Process performance bottlenecks

True business impact is the actual measurable difference in business performance because of decision models. This is where each organization distinguishes itself. Sample impacts on business due to decision models include:

- Agility of policy changes from months to weeks to days with minimal IT intervention
- Discovery of policy errors prior to testing and long before programming
- Simplification of business processes
- Significant improvement in data quality

In summary, each decision model delivers business impact, breaking barriers in its own unique measurable way. However, there is a bigger vision.

The Bigger Vision

Decision models deliver business logic in visual tangible form back to the business people, where it started. They can change it, analyze it, simulate it, and determine when it is ready for production, long before programming begins and with confidence that it is correct and complete. This capability is game changing in terms of organizational governance and agility.

This is the first step in leading an organization out of the age of business rule management into that of business decision management and decision modeling. We believe there are many more barriers waiting to be broken. Experience with The Decision Model has only just begun, but is growing fast.

[As always, we invite readers to join the public group on LinkedIn called “The Decision Model” to hear what others are doing with The Decision Model and to ask questions. There is a potential decision model normalization violation in **Figure 2**. We will discuss it in the LinkedIn group].

References:

1. The one Rule Family is also known as the Decision Rule Family because it is the Rule Family leading directly to the conclusion of the decision.

2. If there is a required sequence among the decision models, separate task boxes will depict the required execution flow.

3. See "Revolutionizing the Testing Process for Business Logic" by Barbara von Halle and Larry Goldberg at http://www.compaid.com/caiinternet/ezine/DecisionModel3.pdf

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Larry Goldberg - Larry is Managing Partner of Knowledge Partners International, LLC, (KPI), has more than thirty years of experience in building technology-based companies on three continents, and in which the focus was rules-based technologies and applications. Commercial applications in which he played a primary architectural role include such diverse domains as healthcare, supply chain, and property & casualty insurance.

Larry is co-author of *The Decision Model: A Business Logic Framework linking Business and Technology* (Auerbach, 2009), a co-editor of *The Business Rule Revolution: Running the Business the Right Way* (HappyAbout.info 2007), is on the editorial board of www.BPMInstitute.org and is the Editorial Director of the BDM Bulletin, a monthly e-publication of the BPMInstitute.org.

Larry joins Barbara von Halle, his business partner at KPI, in writing a column, The Decision Model, in www.Tdan.com and inwww.ModernAnalyst.com (from October 2009). In addition, Larry's writings can be read in industry publications such as www.BPtrends.com, www.RequirementsNetwork.com and www.ITMPI.org.

He may be heard, four times a year, as the track chair of the BDM Symposium at the Brainstorm conference, and at many conferences and industry events around the world. He and Barbara von Halle conduct a very popular series of training seminars on Business Decision Management and the Decision Model, both in person and online.

Larry can be found at www.TheDecisionModel.com and looks forward to hearing from everyone with and interest in decision management, business rules, BDM, EDM, and BPM.

Barbara von Halle - Barb von Halle is Managing Partner of Knowledge Partners, Inc. (KPI). She is co-inventor of the Decision Model and co-author of *The Decision Model: A Business Logic Framework Linking Business and Technology* published by Taylor and Francis 2009. She is the fifth recipient of the Outstanding Individual Achievement Award from International DAMA, inducted into the Hall of Fame in 1995. Known as a business rules pioneer, she has consulted in this area for more than 10 years. She is an invited keynote speaker at conferences in the U.S. and Europe.

Her first book, *Handbook of Relational Database Design* has sold more than 21,000 copies. She was the most popular in Database Programming and Design magazine for many years.

Other book publications include *Business Rules Applied* and *The Business Rule Revolution*. Her recent article in Intelligent Enterprise magazine features case studies from Oregon State, Freddie Mac, Dell Financial Systems, and Pershing LLC.

Barb can be found at www.TheDecisionModel.com where new announcements and materials on the Decision Model appear as well as a link to purchase *The Decision Model: A Business Logic Framework Linking Business and Technology*.

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