DECISION MANAGEMENT SOLUTIONS

Framing Analytic Requirements

How to achieve analytical, data-driven decisions with decision modeling and the Decision Model and Notation (DMN) standard.

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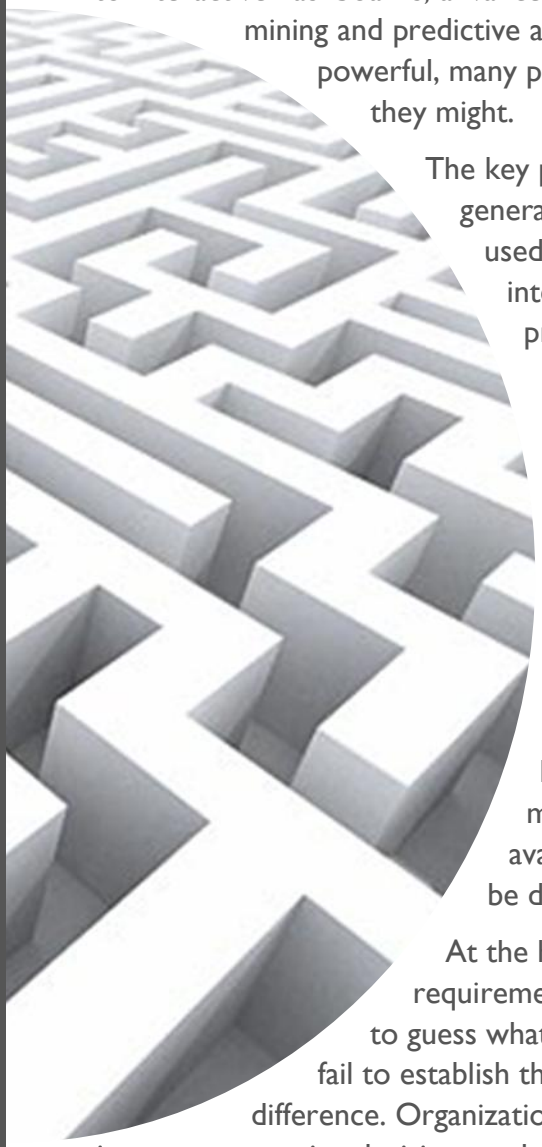
The value proposition of analytics is almost always to improve decision-making. Being explicit about the decision-making to be improved is an effective tool for framing analytic requirements.

Organizations are making significant investments in analytic technologies. These investments range from improved business intelligence and reporting infrastructure to interactive dashboards, advanced visualization tools and, increasingly, data mining and predictive analytics. While these technologies are powerful, many projects fail to get as much value from them as they might.



The key problem for analytic projects is that they generate insight without impact. The tools can be used to develop beautiful visualizations, highly interactive environments and powerful predictions.

Yet ad-hoc, intuitive decision making remains the dominant approach for most employees. Despite investment in analytic decision support tools, analytical, data-driven, decisions remain a rarity.

Similarly most enterprise applications fail to apply analytics to improve performance. Most systems lack even the basic capability to make decisions, constantly deferring to a human user. Even when they do, this decision-making is often mindlessly repetitive, ignoring available data and the analytic insight that could be derived from it to improve results.

At the heart of the problem lies the way analytic requirements are developed today. The focus on trying to guess what data might help and the focus on workflow fail to establish the analytic requirements that will make a difference. Organizations need to frame their analytic requirements in a new way, using decision modeling to explicitly and clearly define the decision-making to be improved.

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Analytic Requirements Today

Organizations generally use standard requirements approaches for analytic projects. They define the data that needs to be provided, they identify the analytic technology to be used and they define the workflow for delivering this data to decision-makers.

Data-Centric

A data-centric approach to analytic requirements fails to frame analytic projects because it focuses on data and not on the insight needed to improve decision-making. Often teams play "requirements telephone", where decision makers ask for some data or a type of analysis but discover that the analysis does not help them make their decisions. So they ask for more data or different analysis and when that doesn't help either they ask for yet another view of the data. And when that doesn't help they often just ask for everything so they can do something in Excel. Without a focus on decision-making there is no way to identify the analytic insight required.

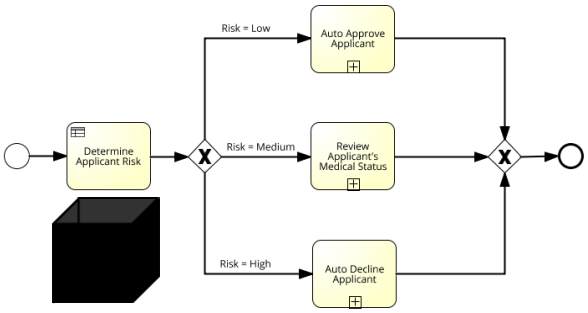
Technology First

Analytic technology has become increasingly easy to use, powerful and visually appealing. This makes it easy for teams to start with a visualization or data mining tool to solve a problem without defining the business problem first. Analytic projects are too often defined in terms of the technology approach to be used, not in terms of the business impact and the decision to be improved. The business results of such an approach generally disappoint.

Workflow Thinking

Finally teams define the workflow of their project, identifying when and where decisions must be made in a workflow so they can identify when and where to deliver data. Doing so does not define decision making, however, it only shows when decisions are made, who makes them and what information they think they need. What the workflow doesn't show is how the decision should be made. Without that awareness the right analytic insight cannot be identified and delivered at the right point in the workflow because the decision-making is a black box.

Figure 1:Black Box Decisions in Workflows



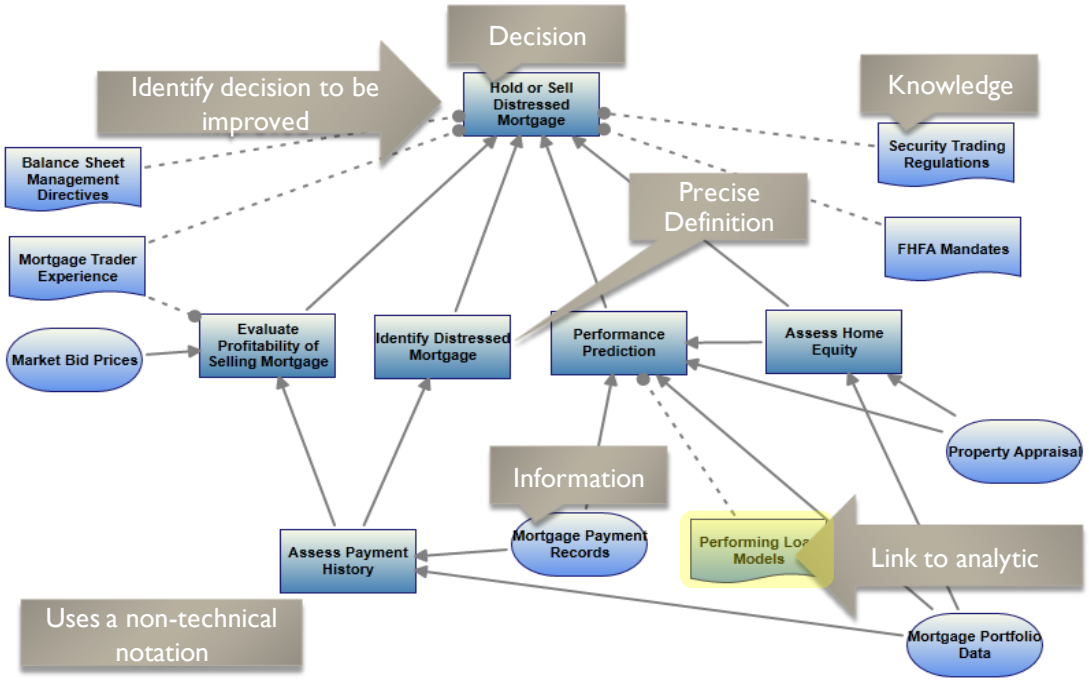
Decisions First Requirements

A more effective way to define requirements for analytic projects, to frame those requirements accurately, is to model the decision-making to be improved. This Decisions First requirements approach provides critical information for successful analytic projects, complements workflow requirements, and correctly identifies the data that will be required for the effort.

Example

Figure 2 shows a decision requirements model for the decision, "Hold or Sell a Distressed Mortgage". This diagram takes the decision to be improved – whether a distressed mortgage should be sold or held – and breaks it down into its component decisions resulting in a precise definition. This breakdown is complemented with the information that is required to make the decision as well as the knowledge required to know how to make it. This knowledge can be policy or regulatory knowledge or analytic insight. A decision requirements model uses a non-technical notation to clearly state how the proposed analytic knowledge will influence the decision in question. The non-technical, graphical view of the decision-making is easy to understand across business, analytic and IT teams.

Figure 2: An Analytic Requirements Example



Source: University of Maryland University College and DecisionsFirst Modeler

A summary of how to build these models is below.

Framing Analytic Requirements

The University of Maryland University College has been using this approach in its analytics classes, led by Professor Steve Knode. Professor Knode highlights seven benefits to the approach, listed below.

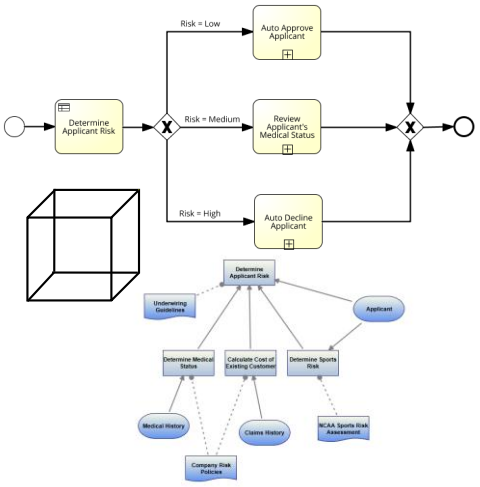
A decision requirements model:

1. Provides "**structure**" to the analytics process (who, what, how, when).
2. Provides "**transparency**" of the decision process so analytics can be applied.
3. Promotes "**buy in**" by engaging business users in describing their problem.
4. Fosters **innovation** by focusing on the problem not the technology.
5. **Standardizes** the approach to decision making whether automated or manual.
6. Enables an **audit trail** for decisions by standardizing its structure.
7. Improves/changes the **business** model not just the analytic model.

Decision and Workflow Thinking

Adding a decision requirements model to a definition of the workflow involved explains how the decision is made as well as when and where. Decision requirements models are designed to complement process and workflow models. With this pair of models the decision-making is transparent and the models explicitly show what information is used, what questions must be answered, how policies and regulations are applied and what role analytics will play.

Figure 3:Decision Modeling for Analytics



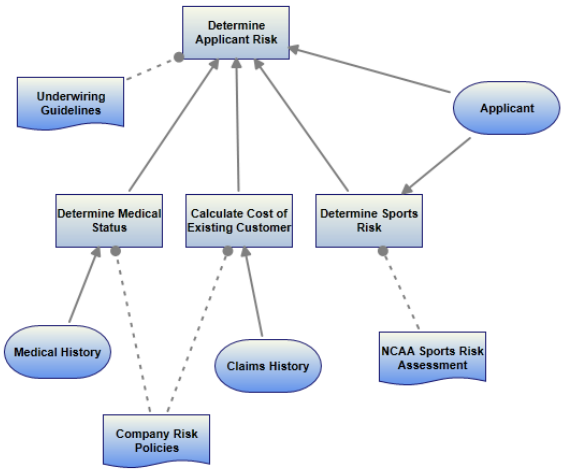
From Decision to Data

By building a decision requirements model and defining decision-making first, analytic teams also answer the question as to what data might be useful. Rather than integrating, cleaning and trying to understand all the data available – an increasingly difficult problem in the era of Big Data – the decision requirements model focuses them on the data that matters to the decision. A decision requirements model allows them to go from the business decision at issue to the analytic required and then to the data needed. This provides focus and a business justification for any costs and development work required to make the data available.

Decision Modeling with DMN

Graphical decision models make it easier to communication and collaborate on requirements and outcomes. Analytic teams can focus on activities that require their expertise, adding further value.

Figure 4: Decision Requirements Model



Source: DecisionsFirst Modeler

Decision modeling using the new industry Decision Model and Notation (DMN) standard provides a framework that teams across an organization can use. It provides a common language between business analysts, architects, business owners, IT professionals and analytic teams. Decisions are more easily tied to performance measures and to the business goals. This makes it easier to focus teams where they will have the highest impact and to measure results.

"This is the critical path to monetizing advanced models."

Head of Analytics, US Insurer

The Decision Model and Notation (DMN) Standard was approved in 2015 by the Object Management Group. Decision Management Solutions is a submitter of the DMN standard along with Escape Velocity, FICO, IBM and Oracle and co-authors KU Leuven, Knowledge Partners International, Model Systems and TIBCO.

"Decision modeling enables us to model our business by dividing it into concrete parts that are understandable to business people without being too detailed."

Process Director, European Government Agency

A detailed description of how to do decision modeling is described in our free white paper, Decision Modeling with DMN, available in the white paper section of our website.

The Benefits of Decision-Centric Analytic Requirements

There are many benefits to this kind of decision-centric framing of analytic requirements. By focusing on business needs first, decision requirements models ensure the right analytics get developed and clearly identify information and knowledge to effectively position analytics for success.

Business Case and Project Comparison

A decision requirements model ties a proposed analytic to the decision(s) it influences and thus to the metrics or key performance indicators (KPIs) that might be improved, the processes and systems that will be impacted and the organizations that care. This enables a solid business case to be made for the analytic and allows for diverse project proposals to be effectively compared so constrained analytic resources can be applied most productively.

Find the Analytics that Work

Decision requirements models also help find the analytics that will make the most difference. By taking a decision requirements model and asking what would help make each decision in it more profitable, targeted or effective, the potential for analytics can be identified. Business people start to ask the critical "if only" questions that drive analytics such as. "If only we knew if this customer is unhappy", "If only we knew if this piece of equipment was going to fail soon", or "If only we knew if this provider was ripping us off".

Link Analytics Explicitly to Action

Decision requirements models link analytics explicitly to the action - the decision - that must be made differently for the analytic to add value. Instead of simply building the analytic and hoping it will make a difference, teams can clearly identify the role an analytic will play in changing decision-making behavior.

Focus on the Business Need for Reporting and Dashboards

When visual analytics such as reports or dashboards are being considered, a model of the manual decision-making they are designed to support can be an effective "wire frame" for their design. A decision requirements model keeps the focus on the business problem, laying out a wireframe of the report elements or dashboard panels that should be developed. Each piece of the report or dashboard focuses on helping the user make part of the decision instead of just presenting the data and forcing the user to jump around as they make their decisions.

Advanced Analytics

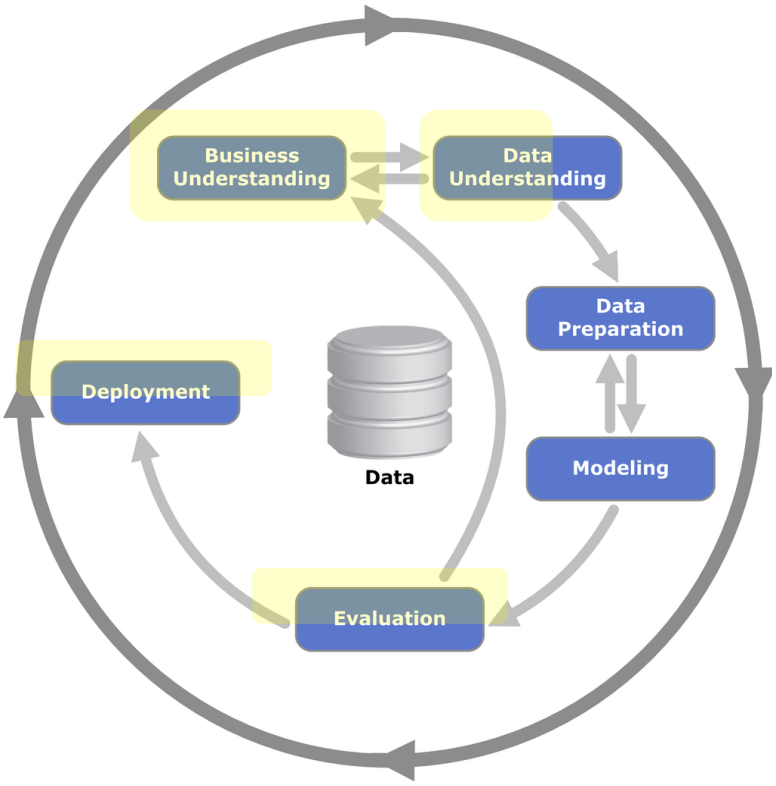
When it comes to advanced analytics such as data mining or predictive analytics, the Cross-Industry Standard Process for Data Mining (CRISP-DM) is the most widely used approach for managing projects. This has three key strengths over other approaches:

- It makes creating business understanding the first step instead of taking it for granted that you know what you are developing.
- It includes a feedback loop to this understanding.
- It includes deployment not just model creation.

This iterative approach is shown in Figure 5.

At the beginning the team needs to develop both business and data understanding. Decision requirements models represent business understanding for an analytic project in a clear and unambiguous form. The model also helps drive data understanding identifying the critical data involved. Beginning with a decision requirements model gets the project off to an effective start.

Figure 5: The role of decision models in CRISP-DM



Source: CRISP-DM 1.0

Once underway, a decision requirements model supports the evaluation loop and provides critical information to support deployment such as the organizations to be impacted as well as the processes and systems into which the new analytic decision-making must be injected.

Key Take-Aways

Decision requirements models are being used by several large organizations as well as university programs as part of their analytic requirements process. Experience with them has been overwhelmingly positive with key particular take-aways:

- Decision requirement models frame and communicate analytic requirements accurately, keeping the focus on the business problem to be solved.
- Decision requirement models are accessible to all teams involved, building shared understanding and allowing non-technical resources to effectively participate.
- Decision requirement models show how analytics will add value and deliver business impact allowing business cases to be developed and projects to be compared.
- Decision requirements models ensure that the requirements for deployment and usage are clear before analytics are developed.

Organizations serious about using analytics to improve decision-making, especially those planning to use analytics at scale, should adopt decision requirements modeling and the DMN standard for framing analytic requirements.

For more information on decision modeling, check out additional resources on decisionmanagementsolutions.com. To sign up for DecisionsFirst Modeler, our decision modeling software, go to decisionsfirst.com.

Contact Us

If you have any questions about Decision Management Solutions or would like to discuss engaging us we would love to hear from you. Email works best but feel free to use any of the methods below.

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