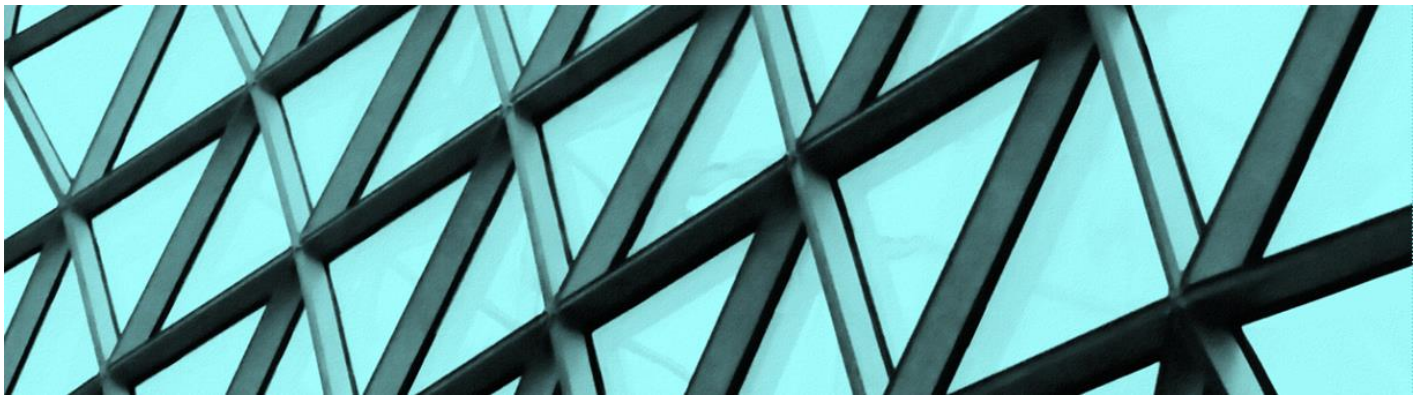
DECISION MANAGEMENT SOLUTIONS



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Business Improvement From Processes and Decisions

Decision Management easily integrates with Six Sigma, simplifying business processes and creating entry points to apply business rules and predictive analytics for powerful business improvements.

Pioneered by Motorola in the 1980s, Six Sigma (6σ) is an official quality management program designed to reduce defects below 3.4 per million opportunities. Implemented correctly, a Six Sigma program is data-driven to implement consistent, repeatable business processes. Six Sigma measures processes and understands where potential defects are — it identifies inefficiencies. Similarly, Decision Management also uses data, and the analysis of this data, to help enterprises maximize revenues, minimize costs, and improve processes.

But there are important differences. Six Sigma is geared to correctness — the reduction of the number of defects per million opportunities (DPMO) — and to processes. The main goal is to look at a process from a different angle: to break the process down and examine which steps are necessary for the result while determining the time, materials, and money that are used at each step. In addition, Six Sigma looks for ways to improve the process and reduce defects.

Decision Management is focused on making accurate and efficient decisions, particularly operational decisions. This requires a focus on decision-making itself and on the decision as a distinct event independent of the process context. This decision focus of Decision Management can be easily integrated with Six Sigma. Because Decision Management defines decisions as peers of processes and creates effective entry points for the new capabilities of business rules and predictive analytics technologies, many companies are adopting both approaches in parallel.

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Processes AND Decisions

There are many ways to approach Six Sigma, but the most common kind of projects go by the acronym DMAIC (Design, Measure, Analyze, Improve, and Control) projects. These projects aim to identify the cause of a problem in a process, and apply the most appropriate solution. Each of the elements — design, measure, analyze, etc. — are phases in the methodology. For a typical project you will likely identify suppliers, inputs, process, outputs, and customers (SIPOC) to get an overall view of a process. This will help identify any sources of variations, critical measures, and provide a definition of success.

Decision Management can be an important part of such a project. For example, consider a process that produces, or consumes, information products. Some processes are entirely focused on information products — credit origination, for instance — while others might produce an information product in addition to a physical one, e.g., fulfilling a book order with both a book (actual product) and a loyalty offer (information product). To apply the DMAIC approach to such a process, you must consider the parts of the process that create or transform these information products.

These transformations are almost always business decisions, for example:

- Given the customer and product ordered, **decide** what loyalty offer to make.
- Given the application information, **decide** what credit line to offer.
- Given this claim, **decide** how much to pay.

To improve this process, to reduce defects, you must consider these decision steps as improvement opportunities and Decision Management is ideal for this.

You will also need a more sophisticated, or at least a different, measure of "defect." When making marketing offers, for instance, a "defect" might mean an offer not accepted. It might also include an accepted offer that lost money or a product priced lower than the optimal price for a given customer. To determine these kinds of "defects" in decisions you need to consider the precision, consistency, agility, speed, and cost of your decisions and compare these to industry norms or your own targets. Any decision that fails to meet these criteria would be "defective." Similarly, you could use the ongoing measurement of these values to track how you were doing over time as part of ongoing monitoring and improvement.

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Automate Decision Improvement

Improving these decisions is another challenge. If you are analyzing a decision that is being made manually then you can only analyze, improve, and control the decision by closely managing the person who makes the decision. This is not, generally, an effective approach for decisions made in high-volume, operational processes. Automating the decision, however, creates new opportunities for improving decision-making more systematically. Effectively automating decisions so they can be systematically improved involves decision modeling, business rules management, predictive analytics/machine learning and AI.

Decision Modeling

A clear understanding of decisions is essential to automate and improve them. Many decisions involve a mix of manual and automated decision-making while an automated decision might involve several related technologies. Decision modeling is a technique based on the new Decision Modeling Notation Standard (DMN) from the Object Management Group, the international industry standards group, to capture this information. Decision Modeling develops a richer, more complete set of business requirements earlier, allowing the right technologies to be applied to the decision. When decisions are made, each element of the model is evaluated and can be collected as this data shows how to improve the decision in the future.

Business Rules Management Systems

The use of a Business Rules Management System to automate decisions within a process has a lot to offer within a Six Sigma program. Rules-based decisions are explicit about how they were taken (which rules were fired). As such, the rules being fired can be easily measured, considered as part of root cause analysis (another important technique in Six Sigma), and systematically improved in a way a manual decision cannot be. A Business Rules Management System is also a great platform for applying predictive analytics, machine learning and AI.

Predictive Analytics / Machine Learning

On a more general note, the use of predictive analytics to compare defects has a lot to offer Six Sigma projects. While simple analysis might identify trends and other problems, more sophisticated techniques are required in decision-intensive processes. For instance, a marketing "defect" may result in a successful offer (one that was accepted) but that was unaffordable so the customer ended up in collections. Being able to predict that a specific customer is likely to end up in collections if offered a more expensive product and so replacing that offer with a less valuable one eliminates this defect. This requires that the decision-making be improved using a predictive analytic model. Over time, sophisticated machine learning (ML) techniques can be applied so that more data can be analyzed more rapidly to produce more accurate and more data-driven decisions.

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AI

Organizations are increasingly trying to apply Artificial Intelligence (AI) or cognitive technologies to their operational processes. The most valuable way to do this is to apply AI to improving decisions in those processes. A focus on decisions, and a decision model, show exactly how AI can and should be used in a decision such that an improved decision improves process outcomes.

An Example

If you have a decision-intensive process, especially a reasonably high-volume process, you can integrate Decision Management into Six Sigma and use these two complimentary approaches together. To show the effectiveness of using Decision Management in a process you need to know the effectiveness of the decisions in the current process (Define/Measure), define an acceptable decision quality and implement a new decision (Analyze/Improve), and monitor the new decisions in order to show their effectiveness (Control).

Step	Tasks	Tools
Define	The project team is identified; a team charter and project plan is developed; customer requirements (CTQs) are defined; a high-level process is mapped.	▶ Identify the decisions within the process ▶ Define decision requirements models
Measure	Metrics are defined; a data collection plan is developed; the measurement system is validated; data is collected; baseline defect measures are calculated.	▶ Link decisions to metrics ▶ Define decision measurement approach
Analyze	Performance objectives are defined; value and non-value added process steps are identified; sources of variation are determined; root cause(s) of defects are pinpointed.	▶ Establish root causes ▶ Analyze historical trends ▶ Simulate to understand impact
Improve	Potential solutions are developed and tested; the final solution is refined and implemented.	▶ Business Rules Management System ▶ Predictive Analytics/ML/AI
Control	An ongoing monitoring and response plan is developed, documented, and implemented; improvements are institutionalized; project responsibilities are transferred to the process owner.	▶ Transfer ownership of decision to the business ▶ Simulate impact of decision changes ▶ Ongoing decision monitoring

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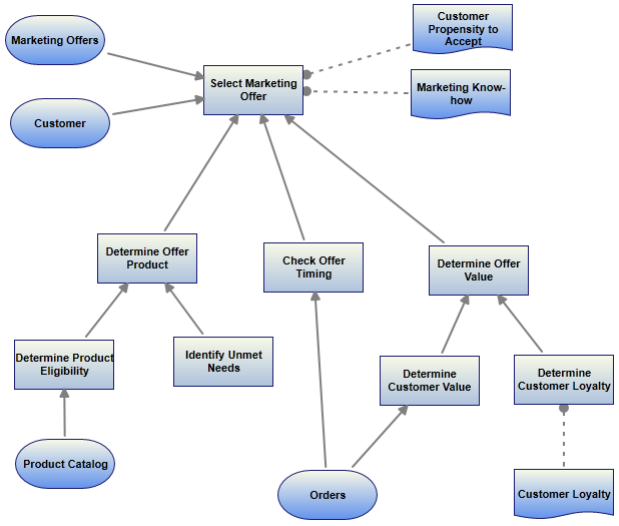
DMAIC with Decision Management

Define

During the define phase you must identify the decisions within the process. You need to adopt the techniques of decision discovery to find the hidden decisions, micro decisions, and, of course, obvious decisions within the operational processes that are the focus of the project. For each decision you need to establish what combination of manual and automated decision-making is used currently. While, in theory, the definition of a process should also define the decisions within it, an explicit focus on decisions and decision modeling is necessary otherwise the process will simply have poorly defined "diamonds" that are too generic to be useful. As decisions are discovered and described - not only the goals, processes and data come together, but there is now a place to attach knowledge, expertise and analytic insights.

Figure 1. Example Decision Model



Measure

In the measure phase you need to consider the possible ways to measure a decision. You need to see if the decision lends itself to a simple measure of defect such as an accepted claim that turns out to be fraudulent. Failing that, you need to consider a wider set of characteristics such as precision or accuracy, consistency, ease of change or agility, speed, and cost for defining defects.

Regardless of the approach taken you will need to identify target defect rates and ways to measure these defects for the decisions independent of any measures of the process. Just as processes should be linked to the business objectives and KPIs of your business so should decisions.

Analyze

In the analysis phase you need to analyze the code and procedures used for decisions in the process and establish root causes for poor decisions. These causes might be bad or missing data, a lack of insight about what the data is telling you, poorly followed procedures, or out of date code. Where you have data you should also consider using analytic modeling techniques to understand historical trends in decision making. This analysis can show when and perhaps why a decision started to go bad, as well as identify potentially useful predictors that will improve the decision. For complex decisions you should consider decision modeling and

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simulation to better understand decisions that impact each other over the lifetime of a customer.

Especially when consider manual decisions, there is sometimes no data to analyze about decision-making. Automating a basic approach and collecting data from that automation may be necessary before analysis.

Improve

One of the most effective ways to improve a process that is dependent on a business decision is to apply a business rules management system (BRMS) to automate decisions. This will give you an immediate improvement by replacing out-of-date code, poorly implemented or understood procedures, and other logic-related root causes with rules-driven decision-making. It will also put in place the infrastructure you need to improve control, the next phase, and ensure that the next DMAIC project that focuses on this process will be able to rapidly and effectively improve the decisions within it.

Analytic techniques also come into play in improvement as you can use data mining techniques to find statistically-significant business rules and then deploy them using the BRMS. These rules will be more effective than purely judgmental rules as they are systematically based on what has worked, and not worked, in the past. Predictive Analytics, Machine Learning and AI can all be layered in to make the decision more sophisticated, more accurate, within a well-defined and measurable decision model framework.

Control

The final phase is that of control. Control builds on the ability to measure and analyze decisions and decision results. Knowing the decision model, and being able to capture the decision structure for each decision made, allows ongoing analysis of decisions against outcomes.

In this phase you should also consider champion/challenger techniques whereby alternative rules and models are executed in parallel to see which will impact defects most effectively. You should also ensure that business users can control the business rules. This is a key element of Six Sigma and a BRMS allows you to empower business users to manage the decisions within the process. This will improve turn-around times, reduce maintenance work, and put business experts in the driving seat.

Finally consider simulating the impact of changes in decisions on subsequent decisions. In complex processes this can improve control and you can use these models to optimize decisions given real-world constraints.

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Conclusion

Six Sigma looks for ways to improve business processes and reduce defects. Decision Management is focused on making accurate and efficient decisions, particularly operational decisions. Decision Management can be easily integrated with Six Sigma simplifying business processes and creating entry points to apply decision modeling, business rules and predictive analytics for powerful business improvements.

- Decision models allow you to accurately **Define** the decisions that must be improved
- Linking decision models to business KPIs and considering decisions as separate opportunities for improvement establishes how to **Measure** success.
- Mapping decisions made to outcomes and simulating the impact of changes allows you to **Analyze** current and future state decisions.
- Business Rules Management Systems, predictive analytics, machine learning and AI can all be orchestrated by a decision model to **Improve** the decision.
- Business rules and decision models can be combined to empower business users and deliver real **Control** over decision-making and its improvement.

Decision Management can drive Six Sigma success.

Learn More

Decision Management Solutions has extensive experience helping organizations learn, adopt and implement Decision Management. Our clients are leading companies in insurance, banking, manufacturing, telecommunications, travel and leisure, health management, and retail.

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Decision Management Solutions specializes in helping organizations build decision-centric, action-oriented systems and processes using decision management, business rules and advanced analytic technologies.

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