Decision Intelligence Is the Near Future of Decision Making

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By Analyst(s): Erick Brethenoux

Initiatives: Artificial Intelligence

Making ever-faster decisions leveraging a maelstrom of data in ecosystems that are in constant motion requires an assembly of increasingly complex techniques. Data and analytics leaders should use decision intelligence as a practical discipline framing a wide range of decision-making techniques.

Additional Perspectives

- Summary Translation: Decision Intelligence Is the Near Future of Decision Making (18 August 2021)

Overview

Key Findings

- The unpredictability of the outcomes of today's decision models often stem from the inability to properly capture and account for the uncertainty factors linked to their "behavior" in the business context.
- Organizations' decision models' sustainability is based on their relevance, transparency quality and resilience.
- Autonomous decision models require greater scrutiny at design time so that their impact can be better understood and disastrous outcomes avoided.

Recommendations

Data and analytics leaders responsible for artificial intelligence efforts related to decision models should:

- Provide decision makers with more flexible decision options by adopting process modeling methods that leverage agent-based modeling techniques.

- Increase the relevance of decision models by systematically involving directly affected business stakeholders as early as possible in the conception of those models.
- Tackle unpredictable emerging analytical behaviors by adopting an objective global outcome monitoring practice and by methodically untangling complex process dependencies.

Introduction

Decision making is becoming more demanding for multiple reasons. These include more speed needed with more competition, more-demanding customers, more scale and automation sought in this era of digitization, more regulatory pressure and the need to be more adaptive.

All of these require a more explicit and effective approach to decision making, which we call decision intelligence. The model we are proposing aims at addressing not only the many challenges related to the growing complexity of decision making, but also the emerging nondeterministic nature of decision making.

In a dynamic and increasingly complex business environment in perpetual motion, decisions are often ineffective because of their execution time. Three key reasons contribute to this:

- It might take too long to execute a decision in the light of real-time observations.
- Decision makers are often unprepared for the real consequences and cross-enterprise impact of those decisions.
- Business processes are siloed and disjointed, preventing the proper harmonization of collective decision outcomes.

The way we traditionally think about decision making is usually through deterministic processes — where an action is taken through a predetermined sequence of events. Uncertainty and unanticipated ad hoc elements are common in complex systems, and result in nondeterministic behaviors; that is, behaviors that are unpredictable by nature.

The Gartner Decision Intelligence (GDI) Model in Figure 1 accounts for that nondeterminism in three ways:

1. Nondeterminism by introducing a Contextualization phase

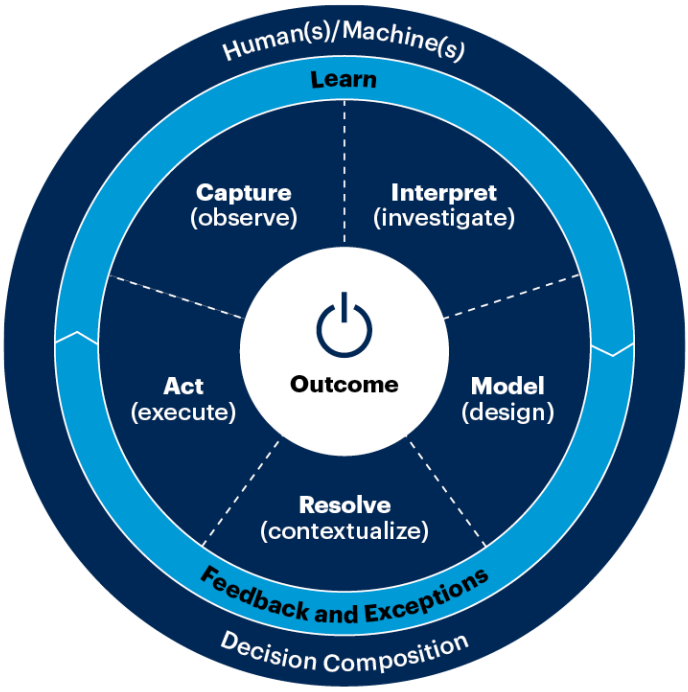
2. Nonlinearity of decision making — starting at any phase

3. The global outcome at the center of every phase

Looking at the "big picture" — the global "outcome" at the heart of the model — is the ultimate goal of every iteration of decision modeling. The idea of serving a global outcome is that even highly localized decision models should always contribute to the bigger picture, and be integrated into an existing decision-making context.

Figure 1. Gartner Decision Intelligence Model

Gartner Decision Intelligence Model



Source: Gartner
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Gartner

Introduction: Defining Decision Intelligence

Decision intelligence is a practical discipline used to improve decision making by explicitly understanding and engineering how decisions are made and outcomes evaluated, managed and improved by feedback.

Analysis

The Gartner Decision Intelligence Model

Let's take a closer look at the GDI Model's three parts.

Part 1. Conception Cycle

- **Capture.** Include all techniques and methods to capture all relevant information and data related to the considered process, which should also account for environmental data.
- **Interpret.** Bring a clear and holistic understanding, leveraging relevant information from all available data and observations, leading to clear (that is, executable and interpretable) courses of action (COAs).
- **Model.** Generate a series of alternative COAs and decision models. Those COAs should also account for causality pathways and conditional dependencies, leading to alternative scenarios.
- **Resolve.** Process instances might, at decision time, run short of options. Nonlinear contextual modeling remains an art more than a science. The idea is to provide the decision maker, in view of unknowable circumstances, with a range of informed and executable COAs that can be quickly executed.
- **Act.** Execute the COA or, alternatively, given a particular set of circumstances, withhold that execution. This element presupposes that the decision makers have the means to effectively act in tandem with their environment.

Part 2. Consumption Cycle

- **Feedback and Exceptions.** Gather external procedures, and provide feedback on how the elements interact or interfere with, or complement each other; align and harmonize decision models across silos. Capture what has not been accounted for within or between elements, but that is inevitable as a result of previously unknowable behavior.
- **Learn.** From every stage and actions undertaken as well as from the completion of each decision cycle; from anticipated actions and feedback or from unexpected situations and exceptions, the idea is to gather data and knowledge and integrate it with previously known patterns, i.e., learn.

Part 3. Context Cycle

- **Human(s)/Machine(s).** Decision models can include different actors, and various tasks can be performed by humans or machines, or a combination of both.

- **Decision Composition.** The decomposition of D&A platforms, AI and data services into smaller reusable components (via marketplaces and packaged business capabilities) creates new design composition opportunities for decision intelligence and decision-making systems and applications.

Provide Decision Makers With More Flexible Decision Options

Decision models have to operate within increasingly complex organizational environments. However, the level of uncertainty plaguing a model's effectiveness is not always the result of unanticipated events. It could also be the result of the irrational behavior of one element within the system.

Decision model simulations are often exclusively based on event-based modeling (EBM), where events and processes are described as a deterministic set of discrete events.

Intelligent business processes (IBPs), which include the capability to alter the course of a process instance as it executes, can be a steppingstone for organizations looking to complement their EBM approaches with agent-based modeling (ABM) methods. IBPs can effectively complement ABM methods in the Contextualization phase of the GDI Model.

Continuous intelligence is a design pattern that can also extend the EBM approach through the implementation of several advanced computing techniques that include event-stream processing, probabilistic reasoning, computational logic and optimization.

Recommendations for data and analytics leaders:

- Provide decision makers with more flexible decision options by adopting process modeling methods that leverage agent-based modeling techniques.
- Optimize business outcomes by sharpening your decision modeling instances through innovative methods such as intelligent business processes.

Increase the Relevance of Decision Models by Involving Business Stakeholders

Within the GDI framework, three principles guide the sustainability of decision models:

- **Relevance.** Every decision should contribute directly or indirectly to the global outcome at the heart of the GDI Model. In customer operations use cases, relevance is often associated with the optimum engagement action that can be taken to acquire, retain or grow the relationship with that customer. In those cases, the concepts of hypercontextualization and business moments become critical to gathering the appropriate data.
    - *Hypercontextualization.* Minimizing uncertainty for maximum relevance implies leveraging much more than just demographic and transactional data. It also implies considering interaction data (such as emails, chats and transcripts) and situational data (such as spatial and geolocation, temporal, sensory, environmental, and even emotional data).
    - *Business moments.* Gartner has defined a "business moment" as a transient opportunity that allows people, data, businesses and things to work together in unique, situationally adaptive ways to create increased value. The transience of the opportunity and its potential elusiveness call for an emphasis on the Contextualization phase.

- **Transparency.** Decision traceability, intelligibility and clear dependencies are essential in gaining the confidence of business stakeholders, clients' trust and regulatory approvals. Causality analysis goes beyond the few insights influencing a particular decision model. It also has to consider the associated decision models that are influencing, either directly or indirectly, that decision. If already difficult to establish within deterministic systems, transparency becomes particularly perplexing with ABM and nondeterministic models — where complex behaviors darken that intelligibility.

- **Resilience.** Ensuring the stability of decisions in the light of complex and continuously evolving processes is essential to their trustworthiness. That stability implies being able to spot damaging biases and harmful privacy breaches (including through unintentional combinations of data sources), while being able to fail gracefully when faced with insurmountable uncertainty. This is something most AI systems have a lot to "learn" about. Resilience is also linked to the principle of subsidiarity, which is defined as "the principle that a central authority should have a subsidiary function, performing only those tasks that cannot be performed at a more local level."

Recommendations for data and analytics leaders:

- Increase the relevance of decision models by systematically involving directly affected business stakeholders as early as possible in the conception of those models.
- Improve the transparency of decision outcomes by adopting an explainable versus accuracy approach; that is, favor the legibility of decision models over their optimal predictability.

Focus on Objective Global Outcomes to Tackle Unpredictable Emerging Analytical Behaviors

From embedded analytical assets to self-contained machine agents, a rising number of autonomous decision models will require increasing scrutiny; ABM techniques are particularly apt at dealing with independent, interacting and self-contained systems. There are three main levels to consider:

- **Human-based decisions.** Within these decision models, artificial systems principally provide information, data or visualization methods to humans, and are not usually directly connected to the decision process.
- **Hybrid decisions.** Both humans and systems work cooperatively to arrive at an outcome. The decision model can call for an apparatus to provide recommendations, or even take action. The proportion of the decision process handled either by humans or machines can vary widely, but their cooperation is the foundation of the outcome. Hybrid decisions are the realm of robotic process automation (RPA) systems, where the decision model includes both attended and unattended automation tasks.
- **Machine-based decisions.** Machines/devices make decisions independently. This artificial system can embody more or less complexity — from, for example, a simple governor control mechanism to a complex decentralized, self-organized system exhibiting emergent properties. An example would be swarm systems and their emerging behaviors.

Recommendations for data and analytics leaders:

- Increase trust in decision models by clearly outlining the interdependencies between the participating analytical assets and the assumptions made to build those assets.

- Tackle unpredictable emerging analytical behaviors by adopting an objective global outcome monitoring practice and by methodically untangling complex process dependencies.

Evidence

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Data and Analytics Leaders Must Use Adaptive Governance to Succeed in Digital Business.

Acronym Key and Glossary Terms

Nondeterminism	A nondeterministic process can provide different outputs for the same input on different executions.
Nonlinearity	Nonlinearity is the behavior of a process, in which the output does not vary in direct proportion to the input.

Document Revision History

Decision Intelligence Is the Near Future of Decision Making: A Gartner Trend Insight Report - 12 October 2018

Recommended by the Author

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7 Levels of Hybrid Human and AI Decision Making