

Healthcare payers must develop and execute an analytics strategy that includes descriptive, rules-based, and AI-based analytic technologies. Individual use cases should be mapped to the appropriate technologies that provide guidance to data analysts on proper usage.

Data to Insights to Action: The Analytics Value Chain

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Introduction

The opportunity to move beyond describing facts to presenting actionable insights that drive business decisions is emerging. When payers can obtain more precise and actionable insights, their analytics deliver greater value. For years, payers have been limited to business intelligence applications that provide descriptive analytics that answer known questions. Rules-based analytics, available to most, are often coupled with advanced analytics and statistics to identify cohorts of patients for inclusion in care management programs. While the output identifies the relative clinical and financial patient risk, it does little to identify the next best action. Applying artificial intelligence (AI) to predictive analytics addresses many of the limitations of existing analytic applications by providing insights to drive decision making.

The Analytics Value Chain

The progression from descriptive analytics (presentation of facts) to AI-based predictive analytics (AI models to predict future events) is not linear — in fact, each type of analytics has its place in the payer analytics portfolio. The challenge is determining which approach best addresses the problem at hand. AI is not a cure-all and will not replace other analytic approaches; rather, it will augment an organization's analytic capability. It should be viewed as another strategy to help organizations effectively introduce more precise and actionable insights.

The adoption of AI in healthcare is nascent, with a great deal of interest driven in part by the promise of AI. Many organizations and IT executives are anxious to adopt AI because it is seen as innovative and a differentiator. While that can be true, newer technology is not without challenges. This paper examines the opportunities and challenges of descriptive analytics, rules-based analytics, and AI-based predictive analytics.

AT A GLANCE

WHAT'S IMPORTANT

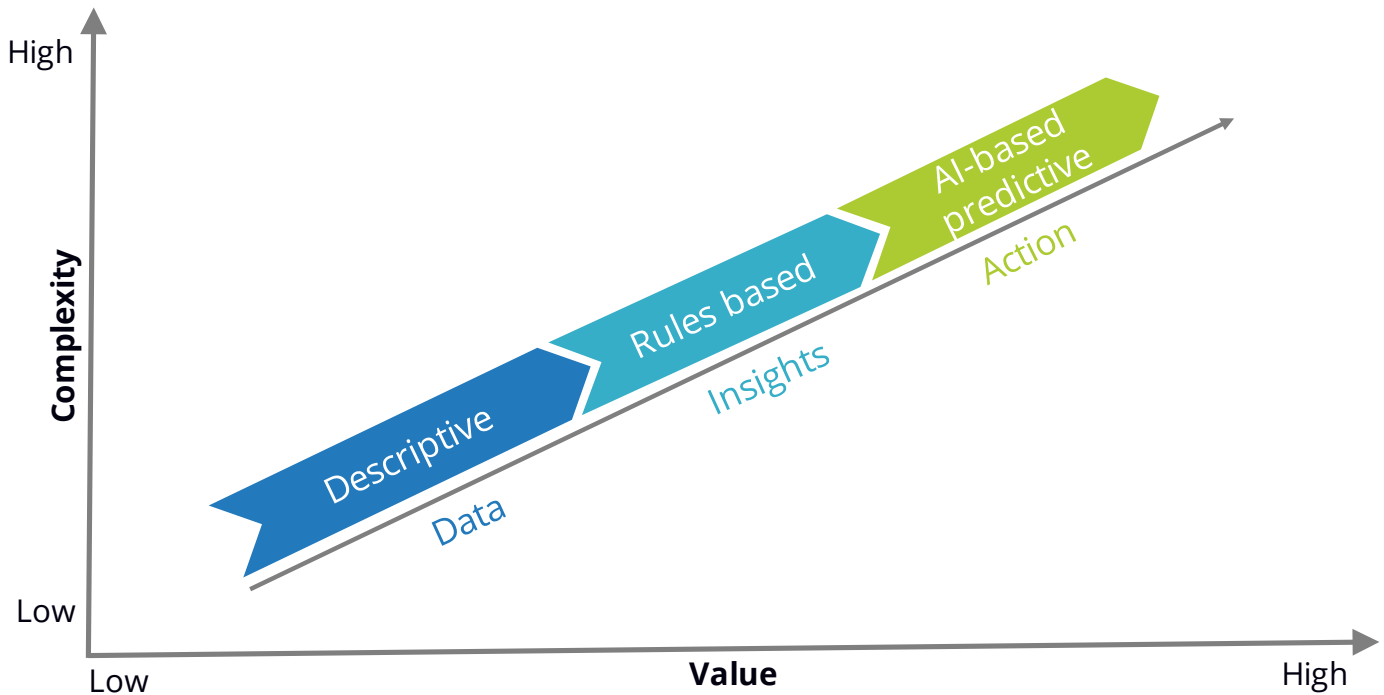
Healthcare payers must build an analytic portfolio to include descriptive, rules-based, and AI-based applications.

KEY TAKEAWAYS

- » Develop best practices and provide analysts with guidance on how to select an analytic approach based on use cases for each of the analytic approaches.
- » Procure the analytic portfolio from a single vendor; avoid multiple point solutions and redundant data stores.

The value chain illustrated in Figure 1 helps payers evaluate their analytic portfolio and develop a strategy to determine where and when it is appropriate to apply different analytic technologies. The objective is to provide the right insights at the right time for current and future business challenges.

FIGURE 1: *The Value Chain for Analytics*



Source: IDC, 2019

Benefits of a Diverse Analytic Portfolio

When organizations are considering the application of AI to payer data, they need to understand which analytic approaches are best suited to specific use cases and then develop a strategy to incrementally build an analytics portfolio of adoption. Here is what we typically find with the different analytics approaches:

- » In most cases, descriptive analysis is adequate when the desired outcome is to measure facts such as profitability, membership, days per thousand, and average wait time for member services. In most organizations, processes are in place, specifications for reports are established, and data is readily available for descriptive analytics. In these use cases, there is no advantage to applying more sophisticated analytics.
- » The use of rules-based analytics, where the output of the reports identifies cohorts of individuals who, for example, are at higher risk for a current health condition or at risk of a future adverse event, is also in place in most payers. Again, processes, data, and specifications are established, and the organization knows what to do with the output of the analysis.

- » The introduction of AI-based algorithms that can consume larger and more diverse data than either descriptive or rules-based analytics brings opportunities and challenges. AI-based algorithms present precise actionable insights. It is important to keep in mind the challenge of data availability — AI requires large volumes of both actual and synthetic data to train algorithms — and the skills required to test, validate, and deploy models. Data scientists are in demand in all industries, and healthcare organizations face recruitment challenges. Even the use of third-party AI algorithms typically requires new skills and processes to determine how best to implement the insights.

Considerations for Building an Analytic Portfolio

Descriptive Analytics

Descriptive analytics summarize facts to answer the question, "What happened?" Descriptive analytics are typically delivered in tables or graphs with some visualization. The data may be presented as a static document or allow the user to "drill down" into the detailed data to perform additional analysis. Basic statistical measures such as means, medians, and ranges are routinely available in descriptive analytics.

Use descriptive analytics to routinely evaluate trends such as key performance indicators. Many external reporting requirements, such as HEDIS, measure data required by the state insurance commission and are good use cases for descriptive analysis. Results from descriptive analysis are typically made available on a regular (weekly, monthly, quarterly) basis as management tools. Descriptive analytics identify changes that warrant additional analysis to discover the underlying drivers. Descriptive analytics rely on data generated from transaction systems such as claims, enrollment, customer service, and utilization management, making the data relatively easy to access and use in reports.

Considerations for Descriptive Analytics

While available, the data for descriptive analytics is retrospective, is drawn from internal systems, and can answer only the question of what happened, not what is likely to happen in the future. Dashboards available for descriptive analytics are improving, particularly in their "drill down" capability, but require an analyst to understand and interpret results.

Rules-Based Analytics

Rules-based analytics use clinical, financial, or operational rules to create cohorts needed for analysis. A common use of rules-based analytics is to identify patients based on the degree of clinical or financial risk often predicted into the future. Rules-based systems for clinical use cases are often built in academic clinical research environments and then commercialized. The logic to build the rules is based on known relationships (mostly clinical) and risk factors. Boolean logic is used to code the relationships with varying degrees of advanced analytics and statistics applied. Many of these rules-based applications are available through healthcare analytics vendors. They continuously evaluate and update their rules systems based on changes in medical practice and industry standards. Healthcare organizations can create and add their own rules.

Use rules-based analytics when the intent is to identify cohorts for further analysis. Rules-based analytics are often used to identify patients who are likely to need additional medical services. Rules in these systems are well accepted, vetted in the industry, and used by both payers and providers. Commercially available rules-based analytics are credible, and data (primarily claims) is routinely available.

The output is easy to understand, the type of adverse event that is likely to occur is identified, and the degree to which a patient is likely to experience an event is quantified. The output from rules-based analytics can be used to drive patients to registries often found in care management applications. The results of applying the rules can be audited, which provides even more credibility. The Society of Actuaries periodically conducts and publishes the results of an evaluation of rules-based predictive analytics used for patient identification and stratification to determine accuracy of the models.

Considerations for Rules-Based Analytics

While rules-based analytics are well accepted in healthcare, a manual process is required to build and maintain the rules. These models typically rely on claims data alone, which is readily available and provides a more complete picture of paid services; however, lack of clinical data from medical records is often raised as a concern. Data limitations result in missing drivers of risk, such as housing or food insecurity. While improvements in diagnostic coding on claims are being made, the quality is still questioned. The lack of clinical data may impede physician acceptance.

Avoid redundant data stores; all applications in the analytic portfolio should use the same curated data.

AI-Based Predictive Analytics

AI-based predictive analytics create algorithms using AI that provide actionable insights across operational, financial, and clinical domains. An example of a clinical model is the use of selected patient characteristics to identify individuals who would most benefit from a specific care management program. Because AI algorithms consume more diverse data sets, the actionable insights are more precise but must be validated by a subject-matter expert before an action is taken.

Use AI-based predictive analytics when your organization wants to better predict the needs of a member.

For example, AI-driven insights can be used to assign patients to more personalized care management programs, identify member communication preferences, or serve up contextualized member information to better inform a customer service representative. This improves the ability to meet the needs of an individual or a family. Because AI-based predictive analytics can consume a variety of data, the algorithms can identify previously unrecognized needs such as clinical, social, and human services. Two individuals might look identical in terms of their clinical profile, but one may be socially isolated and not have access to nutritious foods, while the other may have strong ties to the community and a diet based on organic food. The strategy to improve and manage the health of these individuals will be very different.

An individual's profile is not stagnant, and programs to help manage health must be dynamic. A differentiator for AI algorithms is the ability to consume new information and recommend adjustments in near real time. The healthcare industry must move from siloed, event-driven care to a model that integrates clinical, behavioral, social, and human services. Serving up the "right" insights to customer service representatives or care managers allows them to be proactive, adds tremendous value, and helps build loyalty.

Considerations for AI-Based Predictive Analytics

Many healthcare executives express skepticism with AI-based analytics — they need evidence that they can trust AI algorithm outputs. This is progress, however, toward making the results of algorithms understood and trusted by humans through "explainable AI." It has only been since late 2017 that the use of AI in healthcare has become more widely adopted by demonstrating value.

The original introduction of AI into healthcare was through AI platforms that provide the tools to build predictive analytic algorithms. Few healthcare organizations have staff with the skills to build and maintain the models. The recent introduction of AI-based predictive analytics by AI analytics vendors and traditional analytics vendors has made AI more consumable by healthcare organizations. Introducing AI-based predictive analytics into an organization, even when they are embedded in an analytic application, is not without its challenges. The new capability delivered by AI-based predictive analytics means that healthcare organizations must have strategies in place and build processes to implement new programs and services based on more precise insights.

Conclusion

As healthcare organizations introduce new analytic approaches, they must establish an enterprise strategy that identifies the appropriate use of different analytic methods. Developing a portfolio of use cases mapped to the type of analytic approach will guide individual analysts to the "right" solution to their analytic problem. Organizations should recognize that the legacy business intelligence market is advancing to provide more precision in predictive analytics and apply automation to the decision-making process. Table 1 presents a summary of the three analytic methods discussed in this paper.

TABLE 1: *Summary of Analytic Methods*

Category	Type of Analytics		
	Descriptive	Rules Based	AI-Based Predictive
Primary use	Answer a question	Categorize individuals or cohorts with similar characteristics	Deliver actionable insights into operational, financial, and clinical aspects of an organization
Benefit	Data available, documented specifications, output easily understood	Well vetted and accepted, output easily understood	Broad set of data, greater precision, and actionable insights
Challenge	Retrospective, limited data required, basic statistics	Maintenance of rules, lack of clinical data from the medical record	Skepticism of "black box" algorithms, new skills and data are required

Source: IDC, 2019

When an organization introduces a new analytic approach, it should establish rules of engagement to ensure the proper use of the approach. The introduction of AI-based analytics into an organization, even when the algorithms are provided by a third-party vendor, requires active involvement of both IT and the relevant business/clinical unit.

When selecting AI initiatives, an organization should always include all affected parties — the business/clinical departments shouldn't be left out of the planning and execution. Even skeptics need to be included; better to address concerns early than be derailed by them at the completion of a project. An organization should stay away from sacred cows when selecting AI initiatives; the closer the application of AI gets to clinical practice, the more pushback will occur. It is best for an organization to start with a use case that will represent the biggest win, where the application of an AI algorithm can demonstrate a measurable improvement and, best case, a return on investment.

Remember, no single analytic method will meet all the needs of a healthcare payer. As new methods for analysis are introduced into an organization, it is critical to establish guidelines for analysts to avoid misuse of the technology.

About the Analyst



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Cynthia Burghard is a Research Director with IDC Health Insights where she is responsible for the value-based healthcare practice. A key focus of her research includes the use of cognitive/AI technologies to advance digital transformation in healthcare. Areas of research include analytics, population health workflow, and proactive patient engagement including patient personal assistants.

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