Artificial Intelligence and Intelligent Healthcare Applications
The need to better understand data to improve the practice of medicine is becoming more critical than ever. With the exponential growth and digitization of data, along with new incentives for providers and payers, the industry is poised to benefit disproportionately from the artificial intelligence (AI) revolution. By surfacing subtle but important patterns from billions of data elements from clinical, member, genetic, and financial information, AI is rapidly becoming fundamental to modern healthcare.

AI and intelligent applications are driving the operationalization of this technology by delivering system-wide capabilities for care improvement and cost reduction. Through intelligent, operational applications, AI is giving everyone across the healthcare ecosystem the information that they need to make sound clinical and financial decisions and achieve the goals of personalized and proactive healthcare.

**Intelligent Applications**

Intelligent applications are key to making AI consumable across the healthcare enterprise as they target discrete problems that are critical in today’s new health economy. Ranging from reducing clinical variation to predicting population risk, these applications have a collection of capabilities that make them intelligent – all of which need to be present to constitute a truly intelligent system.

Intelligent Applications empower you to:

- Discover and implement optimal and personalized care paths
- Rapidly identify overpayment hotspots and their precise drivers
- Define and apply best practices to reduce utilization and costs
- Predict high-risk, high-cost patients and their risk drivers
- Segment your population to identify unique characteristics
- Discover the drivers for member loyalty and detractor and promoter patterns to mitigate member churn

**Discovery**

Intelligent applications support both unsupervised and semi-supervised discovery. This means that an intelligent application considers all the data and all the possibilities within that data to detect the patterns, groups or anomalies that elude traditional approaches. Using their own systems of records, including EMRs, financial data, patient-generated data, and socio-economic data, healthcare organizations can automatically discover groups of patients that share unique combinations of characteristics. These groups can then be used, for example, to tailor and personalize diagnostics and care paths. Another example is the discovery of unique patterns or outliers in claims and other member data to aid in member retention or the prevention of fraud or
waste. This type of holistic discovery is unique to AI and improves prediction and makes operational insights possible.

**Prediction**

Intelligent applications are also able to predict the future with high accuracy. Holistic discovery enables even better predictive models through the unbiased creation of groups or the identification of patterns. Superior prediction gives healthcare organizations foresight into the future needs, costs, disease burden, and risks of patients. For example, intelligent applications can determine the groups of patients projected to have the highest escalation of costs over time, as well as other outcomes such as the conditions likely to appear for each group, and an individual’s predicted change in utilization. Predictions can be made across multiple targets and are multi-faceted, considering all factors whether they’re health- or non-healthcare-related.

**Justification**

An intelligent application justifies its predictions, discoveries, and actions in a transparent way so that human operators feel confident to act upon its recommendations. For example, a healthcare application may reveal differentiating characteristics of patient risk trajectories, what factors make them high or low-risk, and descriptions of individual factors that lead to variation in cost and quality. Justification is key because without a thorough understanding of the “why” behind predictions, organizations are unable to adopt AI into day-to-day decision-making.

**Action**

Actionable information that guides and augments human decision-making is what makes AI a part of daily operations. For AI systems to deliver optimal value, they need humans in the loop providing feedback and governance. Whether it be a recommended care path or a detailed risk profile, intelligent applications allow organizations to collaborate on the best actions tailored for each patient population, or to physicians or organizations. Across the care continuum, and within health systems and health plans, this allows clinicians and others to better assess individuals and the best course of care, and more confidently prescribe care and programs for each individual.

**Learning**

Intelligent applications “learn” to improve predictions over time. As more and more data is analyzed, the technology learns from these complex data points to improve predictions over time. Whether it be claims, medical records, or socio-economic data, AI taps into these data points to generate more accurate, personalized predictions that continuously improve. Further, intelligent apps learn the impact of actions over time to support and continuously improve decision making.
About Ayasdi

Ayasdi is the global leader in the development of enterprise-grade, machine intelligent applications for financial services, healthcare and the public sector. Powered by breakthroughs in both mathematics and computer science, the company’s software platform has already solved some of the world’s most complex challenges.

Based in Menlo Park, CA, Ayasdi is backed by Kleiner Perkins Caufield & Byers, IVP, Khosla, CenterView Partners, Draper Nexus, Citi Ventures, GE Ventures and Floodgate Capital.