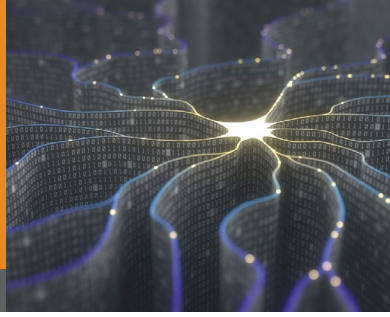
Automating Intelligence White Paper Series:
Operationalizing Analytics to Deliver Business Insights and Personalization



ANALYTICS

Executive Summary

Across industries—from retail, manufacturing, financial services, and banking, to healthcare—analytics is a hot topic. Buzz words such as "Automating Intelligence," are leading a revolution to operationalize analytics—or make analytics actionable. What this means is, businesses that embrace an analytical culture and collaborate on developing an Automated Intelligence framework can achieve their goal of delivering a personalized and superior customer experience.

Though analytics have been a mainstay in many corporations for decades, three recent trends driving this revolution are presenting great challenges and opportunities for solutions in this space.

1. Ubiquitous and Persistent Connectivity

The emergence of the Internet of Things (IoT) provides new opportunities to directly or indirectly interact with people through interconnected and contextual means. Ubiquitous access to broadband internet, additional devices with Wi-Fi capabilities, the growth in smartphone penetration worldwide, and the overall decreasing costs of each in relation to performance have created an environment where nearly any electronic device can be connected to the internet. In the future, one should assume that anything will be connected. By simply looking at the historical growth to date and recent projections of the number of devices in place, the use cases for IoT are staggering, if not impossible to fully comprehend. Not only does the expansion of IoT create an exponential growth in data that can be used for analytics; it also means the customer is always connected (i.e. serviceable).

2. Enhancements in Artificial Intelligence (AI)

From the 1950s to present day, the evolution of AI has followed key developments (which in part, are subsets of each other). With the dramatic increases in computational power, however, these concepts (that have been around for years) have taken on new levels of sophistication which are driving the AI revolution:

- **Expert Systems**—the original implementation of AI, using an ever-increasing set of rules-based algorithms to create a system that can emulate the steps outlined by a process expert
- **Machine Learning**—the first foray into self-learning, Machine Learning focuses not on teaching a machine to do something, but rather giving the machine the ability to learn through experience and improve its "knowledge" over time
- **Deep Learning**—a subset of Machine Learning using Neural Networks to focus on a specific outcome, and then break it into interconnected nodes and weigh the interconnected relationships exhibited between the nodes

These capabilities can be used independently or in conjunction with one another using analytics that are dependent or "self-learning" to enable the third driver:

3. Autonomous Personalized Service Delivery

Organizations can now make analytics actionable by driving complex services with little or no human intervention. The following are just a few examples as to how solution providers use analytics to initiate and manage what were once very human-intensive interactions:

- **Retail Reinvention**—including recent innovations from Amazon and their Amazon Go™ concept stores that virtually eliminate services delivered by humans
- **The Fast Food Industry**—with numerous examples of how companies are driving autonomous service through analytics
- **Self-Driving Vehicles**—a complicated action driven by analytics that has an enormous financial impact, and the potential to change the way people view transportation, altogether.

The result of these three trends together make up the impetus behind the recent interest and exponential growth of analytical initiatives. Together they form a cyclical process that continues to drive innovation in all three facets (see figure 1).

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Each example shows where complex services are delivered in an automated and personalized fashion using very complex analytics. To address these trends, three interconnected strategies were developed to serve as the basis for a framework to enable Automated Intelligence at an unlimited scale, including:

1. **Industrialized Analytics**—showing how to incorporate descriptive/diagnostic analytics, predictive/prescriptive analytics, predefined rules of engagement, and real-time decisioning at an enterprise level
2. **Multi-Dimensional Personalization—**demonstrating an innovative approach for personalizing interactions based on various multiple dimensional strategies
3. **Data Management Solutions for Analytics (DMSA)**[1]*—a real-world approach to how one captures, stores, manages, analyses, and delivers information as categorized across four data warehouse designations; Traditional, Operational, Context Independent, and Logical.

The goal of the Automated Intelligence framework (as shown in figure 2) is to present the successful automation of corporate intelligence through the integration of these three strategies within a common framework. The framework itself is not a solution, but rather a solution enabler that makes analytics actionable in the pursuit of improving some business process and/or organizational interaction. Additionally, this framework helps contextually define and prioritize your efforts to maximize focus and analytical investments.

The following are a set of general guiding principles based upon the framework. These real-world questions and answers should help bring together many of the analytical concepts in a way that helps refine thinking around these topics:

Q: Is Hadoop the answer to all my data storage and processing needs?

A: Probably not. Develop a data architecture strategy that focuses on necessary capabilities, not on consolidating on a single technology.

Too many companies see the opportunity of analytics as being a question of having the right data platform. Whether you adopt a model as proposed by Gartner®, or one of your own, the focus should be on establishing the right platform for the right purpose, and not to fit each purpose into a single platform. Platform consolidation certainly has its benefits, but it should not be the only consideration in determining the right data architecture to fit your needs. Different platforms have specific benefits depending on the use case, so factor that into your decisions. Do not compromise required capabilities for consolidated technology.

Q: If machines can learn, will we need people to do any analysis at all?

A: Traditional data mining still matters as it focuses on priority and scope for analytical solutions.

[1] * DMSA is a Gartner® term.

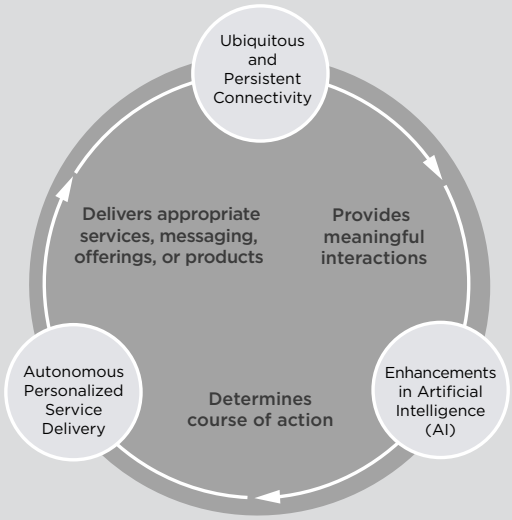

Figure 1.

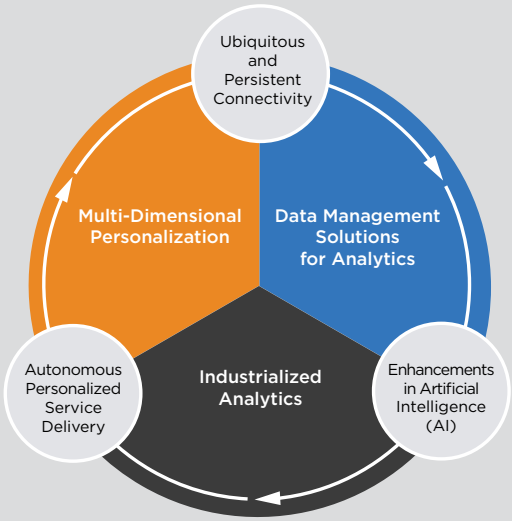

Figure 2.

Today's algorithms can improve themselves (i.e. learn), but cannot easily figure out which problem they need to solve. Many people use the term "machine learning" as a euphemism for "run it and leave it alone". There are certainly applications where this is being done today, but the process by which we determine where to focus (i.e. the problem or opportunity area) is still a systematic process that is more about creatively driving to a business hypothesis than it is technical or mathematical skills. The full vision of AI is not quite here, and there are still tremendous opportunities for organizations to embrace the analytical process. Develop a culture that continues to focus on identification (what) and diagnostic (why) analytical tasks, as these are still the domain of the non-AI mind.

Q: Isn't the move toward real-time analytics, and away from pre-processed analytics?

A: Real-time interactions still require historical context that is typically derived before the interaction.

Many people only consider the response latency for the real-time interaction of a process. What they forget, or fail to realize altogether, is that decisions are made based on learned experiences that provide context to the decision. The better the analytics driving the choices of your process agent, the better (and faster) that agent can react. Real-time interactions can be adjusted at the time of the decision through interactive rules or specified analytics (e.g. Natural Language Processing), but it is primarily the initial context from which the decision parameters are created that will ultimately determine how effective the interaction will be.

Q: Segmentation is an outdated concept; shouldn't I just focus on each customer individually?

A: Segmentation still has a role in the world of personalization.

For decades, marketers talked about the death of segmentation or the segment of one. However, personalization has not eliminated the role of segmentation; instead, it has enhanced the need for a sound segmentation strategy. Understanding a customer means understanding them on many levels. Additionally, there are strategies that need to be applied to customers that exhibit specific traits (e.g., legal communications based upon a customer's geographic location) and these scenarios ensure that segmentation and personalization are not mutually exclusive concepts.

Q: How much autonomous automation can I realistically achieve with analytics?

A: If you are not in a constant state of automation, you will be left behind.

Users are encouraged to explore each Automated Intelligence framework strategy in greater detail and to think about each of them as an independent yet integrated component (each component is available as part of a broader white paper series). The discussion should build upon each topic to eventually overlay the analytical and personalization processes onto the various components of the DMSA categories, and outlining a set of guiding principles on how analytics can best be applied.

Finally, define an approach that recognizes the contentious nature (via conflicting priorities) between IT and the business users, and outline several next steps to implement a program that supports the strategies outlined in something akin to the following:

1. Define/refine your own version of the Automated Intelligence framework,
2. Define a robust discovery methodology,
3. Make an enterprise data lab an integral part of the DMSA strategy,
4. Create a 12 to 18-month analytical roadmap to apply analytics within the organization, and
5. Establish a Release Schedule Mentality.

These recommendations, and the framework in general, are developed with the ultimate goal of developing a culture of continuous analytical innovation through organizational collaboration. Follow this framework and maximize the success of your analytical initiatives.

This paper introduces the Automating Intelligence series. For more details please refer to the following:

1. AUTOMATING INTELLIGENCE: Industrializing Analytics @ Enterprise Scale
2. AUTOMATING INTELLIGENCE: Taking a Multi-Dimensional Approach to Personalization
3. AUTOMATING INTELLIGENCE: Recommended Strategies for Applying Recommendations
4. AUTOMATING INTELLIGENCE: A Pragmatic Approach to Data Management Solutions for Analytics
5. AUTOMATING INTELLIGENCE: Quality Data, the Cornerstone of Effective Analytics
6. AUTOMATING INTELLIGENCE: Developing an Organizational Culture to Maximize your Analytical Initiatives
7. AUTOMATING INTELLIGENCE: The Business-Led Strategy and Framework to Operationalize your Analytical Initiatives

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