A CIO's Guide to Leveraging Decision Intelligence as a Strategic Asset

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Aera

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Overview

Decision Intelligence is a transformative technology empowering organizations to digitize decisions, leveraging leaps in data science, artificial intelligence/machine learning, and process digitization. It's also an area led and adopted by IT that solves immediate business challenges while establishing the foundation to effectively enable long-term digital transformation. This paper is targeted towards Chief Information Officers and Chief Digital Officers, providing practical lessons from early adopters in Decision Intelligence, with blueprints for practical implementation and strategies for building long-term innovation.

1. Aligning Strategic Objectives

One of the most critical roles of a CIO is navigating long-term technical strategy through a highly complicated landscape. There is a constant need to rationalize investments against returns to the business while building IT infrastructure in a way that enhances competitive differentiation and intellectual property (IP) value. Every technology investment is a tug-of-war: minimizing risk versus maximizing innovation, leveraging legacy infrastructure, or starting with a clean sheet, and high-IP custom development against commercially-available solutions. Many innovations coming out of Silicon Valley often ignore this reality of the CIO. Fortunately, there is an approach to the adoption of Decision Intelligence that recognizes these challenges and provides a practical roadmap that realizes value along the way while leveraging investments at each successive stage.

> "Decision Intelligence frees information from the old data and process silos of traditional enterprise applications. It enables more responsive operations focused on delivering business outcomes in the moment – locating underused assets, anticipating interruptions to supply or spikes in demand, coordinating necessary actions, and learning as it goes."
>
> *For an in-depth overview of Decision Intelligence, download the Aera Technology white paper, "How Decision Intelligence Unlocks the future of the Enterprise"*

1.1 Existing Infrastructure and the Rip-and-Replace Quandary

When first learning about Decision Intelligence, CIOs often wonder if adopting it requires a top-to-bottom transformation of the technology stack to achieve its full benefits. What early adopters have found is that Decision Intelligence is unique in that it leverages existing infrastructure to deliver a step-change in business and IT agility. It operates in a hybrid model that retains the existing architecture by smartly connecting to it, natively interacting with it, and creating a new layer that allows the overall architecture to evolve into something much more capable.

One useful analogous model comes from nature itself—the Darwinian evolution of human cognitive capabilities. What does this have to do with our existing enterprise IT infrastructure? It provides us a perfect model of looking at Decision Intelligence—a system built upon our existing IT infrastructure but evolved to a higher-order function. A Decision Intelligence system should have the ability to hook into existing systems, like axons that connect directly to the motor and sensory systems. The Decision Intelligence system should have native protocols to crawl native data structures, interpret their content within the larger enterprise organism, and direct actions back to those systems in their native environment. For example, being able to read inventory data structures natively within SAP and Oracle enables you to keep those investments, while using that information for other purposes and functions, like predicting future inventory, considering adjustments against business needs, and executing responsive action.

1.2 The False Dilemma of Data Lakes

Much has been written about whether data lakes have lived up to their promises to enterprise organizations. A similar amount has been written from vendors about working with or replacing data lakes. Yet the truth is much more complicated, as no two data lakes are ever alike. They vary dramatically in:

- **Breadth:** From scope-confined, well-structured data, to expansive-scope implementations integrated external partners and unstructured data.
- **Data model clarity:** From well-ordered ontological systems (rare), to semi-organized information, to purely unrationalized mirrored storage.
- **Freshness:** From periodic batch processing optimized for low-overhead processing windows, to real-time pipeline ingestion systems.

If we again assume a tightly coupled, yet separately evolved Decision Intelligence system, it doesn't matter whether data is in a data lake or not. Therefore, the only consideration of the data lake is whether it satisfies the basic needs of the system:

- **Sensory Timeliness:** Is the data lake processing data at the speed required by the business? Decision Intelligence systems can only react as fast as the slowest data. Therefore, a data lake batch processing certain information once a day means the reaction time is limited to at least 24 hours for processes utilizing that data. The more quickly that data can be processed, the more likely it can be used seamlessly for Decision Intelligence.
- **Contextual Structure:** Decision Intelligence systems provide a tremendous amount of contextualized data from explicitly understanding how data is structured in those vendor systems, and implicitly by knowing how to derive deeper context using the master data definitions of those systems. The most useful data lakes are the ones that retain their native data structures.

This means data lakes are perfectly capable of working with Decision Intelligence if data passes the test of timeliness and contextual structure.

1.3 Business Intelligence as a Means AND an End

Business Intelligence (BI) is a huge industry of its own, with many organizations investing heavily in software, training, and embedding BI into their standard operating procedures (SOPs). However, there are two key considerations of BI in terms of Decision Intelligence:

- **Dashboard Sprawl:** The list of available dashboards within an organization rarely shrinks. Beyond how many reports and dashboards are actually used or useful is the question of how many of them only serve for interim decision assistance. A Decision Intelligence system can enable organizations to retire large sets of interim reports that exist to serve manual decision processes. For example, does an organization need a series of ABC inventory reports in a system that automatically incorporates ABC attributes in automated decisions. Or, does ABC segmentation become irrelevant when decision processes can now be made, at scale, down to the most granular level?
- **Glass Box vs. Black Box:** BI can serve a role when integrated with a glass box (i.e., a transparent implementation showing exactly how a decision or recommendation was made) approach to Decision Intelligence. Failed attempts at Decision Intelligence have attempted black box approaches where humans couldn't see or understand why a system came up with a recommendation. This hinders adoption as users can't grow to trust the recommendations being made.

A good Decision Intelligence system should be much like an experienced business analyst, capable of making independent decisions while able to fully explain and defend that decision. A good Decision Intelligence system should have that level of transparency, using a glass-box approach and incorporating relevant BI reports to explain decisions. Better yet, they can also serve as critical learning moments when humans can pass along different interpretations of the same data from which the system can learn over time.

The result is Decision Intelligence can reduce reliance on a large number of reports, enabling the organization to focus BI efforts on analysis in core IP areas or exploring potential strategic actions of the business.

1.4 A Data Scientist-Friendly Platform

One of the most constrained assets of any IT/technical organization is hiring, retaining, and effectively utilizing data science talent. Yet the day-to-day job of a data scientist has little to do with their specialty and value-added potential; rather, it is spent discovering and preparing data.

One of the strongest benefits of a Decision Intelligence solution is the harmonization of data as an integral part of the platform. A tremendous amount of time can be saved by:

- **Creating a harmonized Decision Data Model:** A core function of a Decision Intelligence platform is the organization and harmonization of data. The platform continuously crawls enterprise systems; refines, indexes, and augments data; and delivers end-to-end, real-time visibility into your company's operations.
- **Data Specialization of Duties:** An abstracted Decision Data Model also means data preparation functions can be handled by a separate set of analysts and processes. Data analysts can manage and administer the set of data preparation for the systems they are experts in. This enables data analysts and data scientists to spend far more time on their core skill sets.

> 79% of data scientists' time is spent on collecting, organizing, and cleaning data.[1]

Artificial intelligence/machine learning (AI/ML) will continue to be a dynamic and evolving technology domain. A well-implemented Decision Intelligence platform enables a multimodal approach:

- **Integrated Data Science Tools:** A core set of methods and algorithms should be part of a Decision Intelligence system to enable rapid prototyping and easy deployment by data scientists. This includes rapid model creation, operationalization, and performance monitoring to improve models.
- **Library of Task-Specific Algorithms:** Even at this early stage of data science, there are core sets of established algorithms best suited for specific common tasks, like demand forecasting. A good Decision Intelligence platform also includes common algorithms for those common tasks, typically outside core IP activities of an organization, that benefit from AI/ML application but wouldn't necessarily be where organizations want to invest their data scientists' time.
- **Bring-Your-Own-Models:** Many organizations already have operationalized models from either in-house development or developed by external third parties. A Decision Intelligence platform allows organizations to host pre-developed models within the same platform.

This flexibility creates an operationally nimble data science cortex that improves the efficiency of in-house data science teams and preserves maximum flexibility for these teams.

[1] Forbes: Cleaning Big Data: Most Time-Consuming, Least Enjoyable Data Science Task

1.5 Resource Optimization and Evolving (Not Replacing) Headcount

Headcount is a significant component of any CIO's budget. But managing these assets goes beyond simple head-count costs. More important to most organizations is the return on this investment to the core operations of the business. Unlike robotic process automation (RPA), which derives value from human process replacement, one of the hallmarks of Decision Intelligence is the elevation of roles held by staff members and an increase in their overall effectiveness. In fact, Decision Intelligence helps the following critical areas:

- **Segmentation and Optimization of Duties:** Technical staff fall into several specialized categories by training and preference. A well-designed Decision Intelligence platform will accommodate these specialties and avoid monolithic software training:
  - **System Analysts/Data Engineers:** Enables IT professionals with expertise in specific systems, or specific related data sets, to configure and manage connection and data extraction for these systems. They can utilize pre-defined protocol and data-mapping crawlers to point-and-click connect standard data sets, while also using integrated visualization tools for non-standard data transformation rules needed for an organization's customized or idiosyncratic data sets. This work is published in a common data catalog in the Decision Intelligence platform for use by other team members in their activities.
  - **Business Analysts:** Allows the typical creation of reports and KPIs needed for digitized decisions. Reports and dashboards are available in a common catalog for use by various decision processes and callable as part of the glass-box approach to Decision Intelligence to show how decisions were made. Business analysts can use APIs to call existing analytics for use in an organization's existing data lake or BI infrastructure.
  - **Data Scientists:** Gives data scientists access to pre-groomed data sources and focuses on tasks closer to their core duties: model creation and management, outlier/clustering strategies, validation and holdback strategies, performance monitoring, and tuning. They are also able to create their own data sets if needed, utilizing the same tools used by business analysts and data engineers. Data scientists are able to connect any existing models or models created in other data science packages, for use by the Decision Intelligence platform.
  - **Business Process Analysts:** Enables process analysts to build or select from a catalog of predefined process rules that reflect an organization's business goals. They can also utilize object-oriented access to data sets, analytics, and AI/ML sub-processes as components of process rules. Process analysts may also create reusable processes (forecast process, allocation processes, RFQ processes, and more) that can be used across multiple digitized decisions.
  - **Business Process Managers:** Enables business process managers to define business rules or criteria that reflect SOPs and risk appetites. This includes regional restrictions or rules, thresholds for decision automation vs. human exception workflows, customer requirements, location requirements, and more.
  - **Digital Transformation/Change Managers:** Enables transparency into how Decision Intelligence platforms are performing automation decisions and how teams are interfacing with the platform in augmented decisions. It also provides visibility into recommendation execution and results for improving processes.

- **Reduction in Non-Value Added/Non-Intellectual Process Work:** With both predefined process and skills catalogs for common operational processes, and object-oriented digital decision processes defined, a team can significantly reduce time spent outside the core revenue-generating activities of the business. For example, digitized inventory management can handle the day-to-day task of balancing material inventory against cost and service goals, while your teams focus on network redesign or postponement strategies, and other long-term strategic priorities.
- **Self-Service and Retention:** The final outcome of separation of duties, self-service access to catalogs of data, analytics, and processes results in less time spent on repetitive and non-value-added activities and more opportunities for creativity, collaboration, and innovation. It also enables teams to participate in cutting-edge Decision Intelligence using existing skill sets.

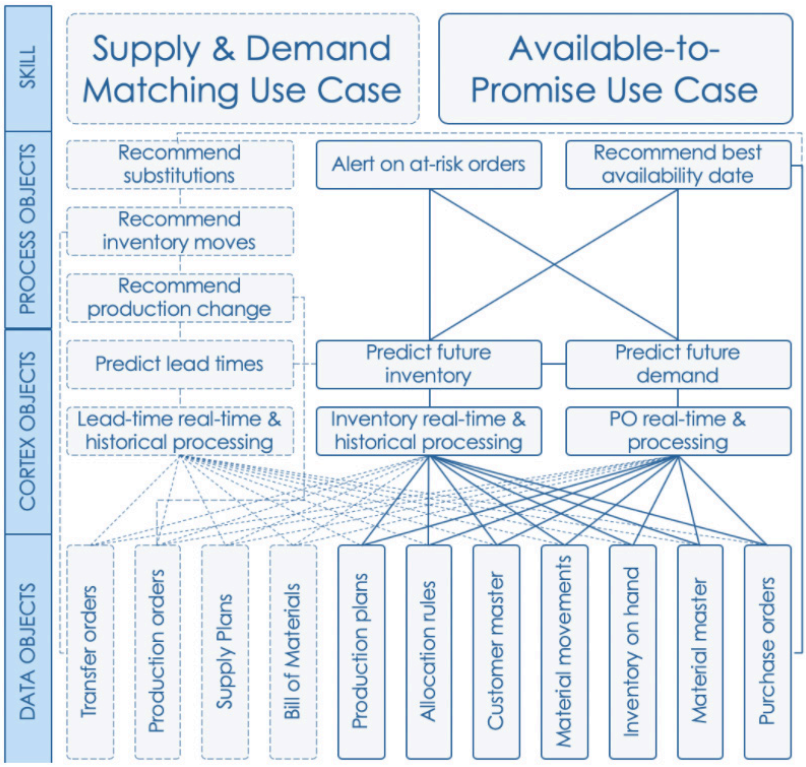
2. Building Capabilities and Realizing Value

We've already discussed how Decision Intelligence integrates with existing systems and avoids the need to "rip and replace" your current tech stack. Now let's consider the other major challenge: achieving faster time-to-value and greater value over time with this disruptive technology, without having to wait years to see ROI.

Decision Intelligence allows companies to focus on an initial, reasonably sized use case in order to gather data and increase adoption. As the platform learns and users gain trust in the recommendations being generated, more decisions can be digitized, augmented, and automated – building on the decision data model and the platform's memory of all the decisions made to date.

2.1 Interoperability and Investment Reuse Strategies

In a reusable object model, capabilities built in one case can also be used by other use cases. For example, the Available-to-Promise (ATP) use case creates a cortex object (higher-order information processing) that predicts future inventory at the SKU/ location grain. A second use case, Supply and Demand Matching, adds the ability to recommend actions and meet ATP and demand promises. This also reuses the predict future inventory object but enhances it with ties to upstream production lead time predictions.



CIOs can achieve faster time-to-value by implementing Decision Intelligence using the following strategy:

A. **Identify a well-defined use case aligned with immediate priorities:** A good Decision Intelligence platform will be flexible enough to be used in a limitless number of use cases. The first step in deploying such a platform is to identify a use case with both well-defined measurements recognized by executives and with some measurements already in place. This approach immediately focuses a transformative technology towards a specific business return and provides technical clarity towards the systems, objects, and recommendations needed to fulfill it.

B. **Document potential next use case priority list:** Knowing which adjacent use cases may be developed in the future helps design reusable objects for these future use cases, while also ensuring extensibility to the initial ones as enhancements come online.

C. **Implement a stepwise leveraged investment strategy:** Once an object view of use cases exists, it becomes clearer which use cases are the shortest step away from existing use cases. Sequentially deploy adjacent use cases as they align with business needs. Establish non-adjacent use cases when needed by the business, and follow the same adjacency model to accelerate related use cases.

D. **Enhance previous use cases with each new step:** As data objects and cortex objects are available for more of your end-to-end supply chain, periodically review where use cases can be enhanced. For example, an ATP use case can predict availability based on data objects from production to fulfillment. Implementing material availability adds data objects on supply and bill of materials (BoM) considerations. This means the ATP use case can now extend farther upstream (e.g., BoM explosion and raw material availability prediction) with finer accuracy and granularity.

2.2 Transactional Rationalization

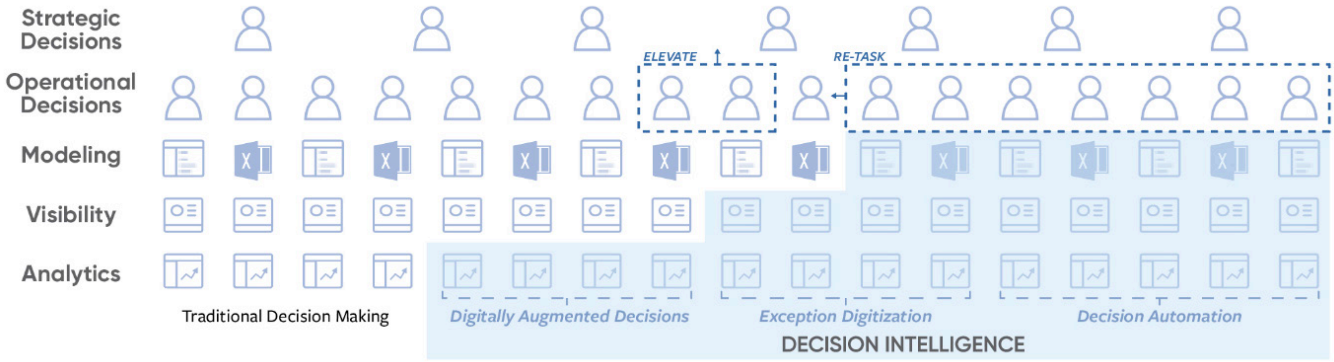
While ERPs and other similar transactional systems have been the anchor of supply chains since the 1990s, these technologies have not delivered transformative improvements in the past several decades. Even the move to cloud-based models and in-memory database strategies have been incremental functional improvements. Furthermore, most of these technology areas have coalesced around a few very large vendors more interested in preserving these core applications' market presence and attempting to innovate by acquisition. For CIOs, this situation has translated into technical monoliths that are slow to advance. And when they do acquire new products or technologies, these acquisitions often don't integrate well or require significant investment in custom integration projects.

Decision Intelligence helps organizations better rationalize big IT investments by enabling the following strategy:

- **Focus investment in large transactional systems on stability and cost optimization:** Transactional systems are a critical part of a company's strategy, but the priority is ensuring stability.
- **Overlay a Decision Intelligence platform:** Multi-year, expensive upgrades of a monolithic transactional system as a part of a digital transformation effort expose the organization (and CIOs) to significant risk and considerable out-of-budget cost growth. Decision Intelligence enables organizations to take innovation pressures off core transactional systems. Just as importantly, it also means you can define better cost controls on these systems and better allocate funds to innovations that don't rely on legacy infrastructure.
- **Adopt a continuous improvement model by creating smaller, more agile teams.** Transformation projects based on transactional system upgrades often strain IT staff and leave little breathing room for CIOs who need those resources elsewhere. Decision Intelligence makes it easier to move away from those monolithic projects and create agile teams, allowing the IT organization to adopt a continuous improvement model rather than the multi-year model that has been traditional.

2.3 Report and Application Reduction

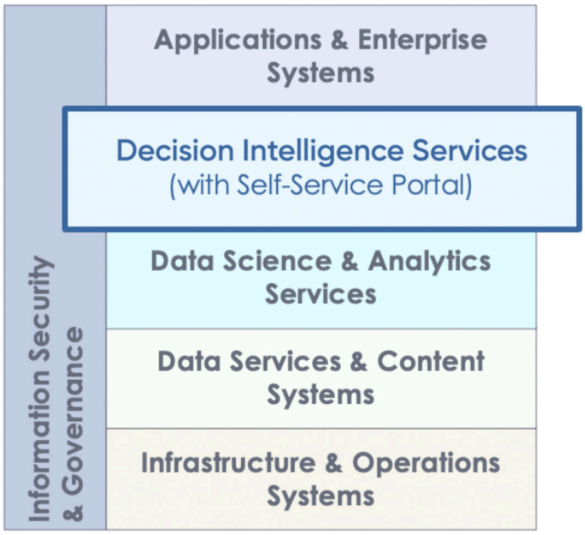
BI packages have long benefited organizations and represent a core part of an IT strategy. However, after years of deployment, many companies have a host of reports that must be maintained. One of the benefits of Decision Intelligence is the digitization of decisions and the removal of manual activities and reports. Digitizing and automating decisions has the added benefit of making many of these reports and dashboards unnecessary. For example, with automation of stock-out prevention and supply and demand matching, organizations that once relied on overnight stockout reports no longer need them.



With Decision Intelligence in place, you can systematically retire legacy reports and applications:

- **Analytics:** Applications or spreadsheets that do offline calculations for use in manual decision making.
- **Visibility:** Reports mainly used in process meetings or purely to assist decisions should either be integrated with the Decision Intelligence platform (as part of the previously discussed glass-box approach) or retired completely.
- **Modeling:** Any previously standalone modeling tool should be either integrated into Decision Intelligence or retired. The tight coupling of data, analytics, and decision processes of Decision Intelligence makes modeling activities much more effective than non-integrated modeling. For models that make sense as stand-alone packages, look to leverage inherent API integration points available in the Decision Intelligence platform.

3. Maximizing Value Over Time



A well-implemented Decision Intelligence solution gives the business tremendous flexibility in digitizing decisions. While every organization has its own flavor of IT services, the illustration at left shows one variation where Decision Intelligence services enable centralized decision-making processes and flows that are leveraged across the business. A self-service portal with deep role-based access not only enables teams to create their own AI/ML Skills but also enables interfacing with your other IT teams.

For CIOs, the challenge is now to build this capability in the most practical and effective way possible. The following sections provide recommendations on how to do exactly that.

3.1 Think Long-Term; Execute Near-Term

When implementing your first use cases, you will likely leverage a trusted third party. As a natural part of this deployment, you will create a core set of internal users who become knowledgeable about the application. You should consider staffing your internal teams with experienced project managers with leadership abilities who can guide the progressive integration of these capabilities within the organization. A good team will think about the potential replicability of these projects, ideate around the potential of other skills, and serve as pathfinders in your future Decision Intelligence projects.

3.2 Gradual Integration of IT Teams with Decision Intelligence

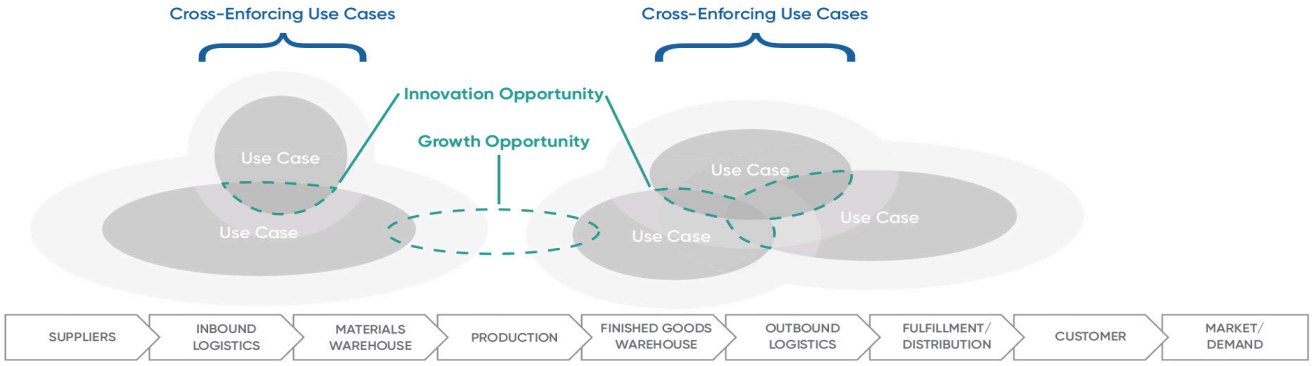
Once the first few use cases are deployed, most organizations begin taking a more hands-on role in developing Decision Intelligence skills. Beyond the normal core teams working with your external deployment partners, there are generally two teams that become much more engaged:

- **Data Science Teams:** You should actively involve data science teams across your various use cases. An open, integrated Decision Intelligence platform makes it easy to do so. You'll find places for your teams to integrate existing data science projects in some use cases, or data scientists will want to explore writing their own models to augment those use cases. Regardless, this is a natural way to augment data science teams and begin getting more power out of your Decision Intelligence platform.
- **Analytics Teams:** Data analytics teams are usually among the first to immediately grasp the opportunity Decision Intelligence offers. They are familiar with the challenges related not only to data, but also where the business is struggling to get the information to make timely and informed decisions. There are two immediate benefits to involving these teams early in the Decision Intelligence journey: 1) These team members are often quickest to train on Decision Intelligence given their existing skillset and 2) they provide very quick clarity on where Decision Intelligence can have immediate value and where analytics can benefit from interfacing with the platform.

3.3 Developing Dedicated Decision Intelligence Teams

After an organization has several use cases, there is a natural point where it makes sense to have dedicated teams to design, build, and maintain your company's developed Decision Intelligence skills. There are three main factors that drive the formation of these teams:

- **Decision Intelligence as a Significant Part of the Business:** The most obvious driver to form these teams is when Decision Intelligence is making thousands of decisions every day for significant parts of the business. Once you reach this threshold, there is critical mass of decision memory from which these teams can further refine and optimize these skills. This is also the point when having in-house talent makes natural sense.



- **Overlapping Use Cases for Innovation:** As mentioned earlier, Decision Intelligence use cases adjacent to one another tend to reuse overlapping data and processes. At this point, internal teams will tend to see opportunities to cross-connect skills to get richer decisions as well as leverage extensive historical data for deeper data science analytics. In some cases, there may be ways to integrate these data sets with other existing projects. For example, a cluster of use cases in demand planning and promotion optimization could help augment projects in sales or marketing initiatives.
- **Connecting Use Case Islands for Growth:** While isolated use cases can be solved with Decision Intelligence around specific parts of the supply chain, nearly all use cases operate best when considering full end-to-end connections. Organizations with dedicated Decision Intelligence expertise will actively connect use cases to better leverage objects, processes, and analytics. For example, an Available-to-Promise (ATP) use case that can be solved by focusing from manufacturing to fulfillment, and connecting it through to supply (manufacturing prediction, BoM explosion, supply material inventory prediction, and procurement automation) provides deeper granularity and extends ATP to Capable-to-Promise.

Following this blueprint enables CIOs to build a strong service-based organization with innovation teams who are experts in Decision Intelligence.

Conclusion

CIOs with a long-term view of the role of Decision Intelligence can implement this disruptive technology without the traditional burden of monolithic software projects that soak up budgets and IT staff time. By looking at Decision Intelligence as an overlay on top of your existing IT stack, you can evolve your IT capabilities in a way that provides returns to the business at each step along the way. With an eye towards core decision-making capabilities, CIOs can grow core staff capabilities aligned with the value to the business. Not only does your business achieve better decision-making agility by automating thousands of daily repetitive decisions, but your team's roles are free to evolve so they can do what people do best – innovate, create, and adapt.

About the Company

Aera Technology is the Decision Intelligence company that transforms how enterprises make and execute decisions. Our innovative platform, Aera Decision Cloud™, integrates with existing systems and data sources to enable business decision making in real time, at scale. Trusted by many of the world's best-known companies and brands, Aera is helping enterprises operate sustainably, intelligently, and efficiently. For more information, visit aeratechnology.com.

Understand.

Continuously crawls enterprise systems

Refines, indexes, and augments data in real time

Enables end-to-end visibility into operations

Recommend.

Leverages real-time data and AI

Predicts business risks and opportunities

Engages users with data-driven recommendations

Act.

Proactively alerts users

Executes decisions autonomously by writing back to source systems

Learn.

Records decisions made and their outcomes

Captures institutional and domain knowledge

Enables continuous learning and improvement

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