Accelerating Digital Transformation with Digital Knowledge Technology™

See how the most innovative Fortune 500 companies are Accelerating Digital Transformation with Digital Knowledge Technology
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Rethinking the Promise of Data Lakes

Big data analytics has been a big focus for many companies over the past few years. Fortune 500 companies have augmented their data warehouses by spending tens of millions of dollars to create data lakes and fund lengthy big data projects. Most of these analytic initiatives have been performed in departmental silos with limited business value, but have not had significant impact on increasing enterprise-wide profitability.

The approach to gather data from across the enterprise and consolidate it all in one place in hopes that data scientists can mine it later for insights and stumble upon the right answers has simply failed to deliver measurable ROI.

Today’s most progressive companies are transitioning away from data-centric technology – and driving innovation and optimization by embracing digital knowledge technology™. This next paradigm in technology goes beyond data analytics and is uniquely able to capture and model the complex relationships between how business processes, assets and organizations operate and interconnect.

The Most Innovative Fortune 500 Companies are Driving Digital Transformation with Digital Knowledge Technology™

The most innovative Fortune 500 companies such as GE, Chevron, Maersk and Shell have accelerated digital transformation from five years to two years using Digital Knowledge Technology. These industrial giants have always been at the forefront of innovation and set the trends for their respective industries. And they are driving digital transformation throughout their enterprise with a relentless commitment to optimize every asset and process throughout every aspect of operations.

To realize their goals, these companies have adopted digital knowledge technology, a new breed of technology pioneered by Maana that takes a knowledge-centric approach, rather than a data-centric approach. This unique approach called Digital Knowledge Technology enables enterprises to easily turn human expertise and data from across silos into digital knowledge to provide continuous, actionable recommendations into the operations of assets and workflows — accelerating time to value for asset and process optimization.

Using the Maana Knowledge Platform™, GE, Maersk and Shell are solving their toughest optimization challenges with results 3 to 10 times faster than any other technology and are completing a full digital transformation in two years vs five years with current solutions.

So why are these industrial giants turning to digital knowledge technology? How does it work? What innovations makes digital knowledge platform deliver greater profitability in months.
Maana: Delivers the First Digital Knowledge Platform to Accelerate Profitability

Maana pioneered “knowledge technology” for the enterprise. The Maana Knowledge Platform turns human expertise and data from across silos into digital knowledge for employees to make better and faster decisions. Digital knowledge is a network of models that provide continuous, actionable recommendations into key decision flows of the enterprise.

At the core of the platform is Maana’s patented Knowledge Graph™, which combined with Maana’s algorithms, expedite extracting knowledge directly from data silos and information sources to reveal their relationships in the context of optimizing assets or processes. Maana represents knowledge in the form of models and the Maana Knowledge Graph is the network of models that are developed to optimize specific assets and workflows.

Maana Knowledge Platform enables SMEs to quickly build models that answer complex questions and extract the information needed to understand the relationships and interdependencies of business processes and assets across their organization. These models represent concepts, entities, properties, and relationships that subject matter experts (SMEs) and data scientists can reason over together.

The flexibility of the Knowledge Graph enables groups across an organization to leverage and build upon the initial Knowledge Graph, accelerating the development of hundreds of models for iterative collaboration. As more knowledge models are created, the Knowledge Graph expands, and time-to-value is accelerated even faster. All models are dynamic, so once they are operationalized into line-of-business applications, they learn and adapt based on user behavior, providing continuous intelligence for day-to-day operations.
The Maana Knowledge Platform includes a set of sophisticated artificial intelligence (AI) algorithms that enable subject matter experts to quickly create models for faster decision making. Maana's approach to AI is drastically different than traditional big data. We begin with the problem, in the form of a precise question, which serves as the basis for a series of interconnected and reusable mathematical models. These models answer the precise question by capturing the observed and perceived relationships between business concepts.

Maana's AI algorithms employ “user-guided, machine-assisted” paradigm, using artificial intelligence, in the form of Knowledge Assistants. These Knowledge Assistants enable users, under their human guidance, to build, connect, and find similarities from the various sources of knowledge. Maana’s AI algorithms accelerate answering complex questions by analyzing hundreds of millions of data in minutes, something no human can possibly do. It then provides suggestions, like identifying patients with similar symptoms or finding fraudulent behaviors in the massive Bitcoin virtual currency network.

Maana enables enterprises to translate insights into recommendations and embed them into the line-of-business applications for thousands of employees to make smarter day-to-day decisions. The result of this operationalization forms a feedback loop providing executives an understanding of the impact that Maana has on the business and its KPIs.

That is why the world’s largest industrial companies such as GE, Chevron, Shell and Maersk are using the Maana knowledge Platform to optimize assets and processes 3 to 10 times faster than any technology and are leading their industries in digital transformation. The results speak for themselves and are translating into hundreds of millions of dollars in increased profitability.

- 67% reduction in unnecessary parts ordered for field service maintenance
- 65% improvement in accounts receivable collections
- 5% reduction in major asset downtime

Customer Case Studies

To better understand the business value of the Maana Knowledge Platform – and the potential of Digital Knowledge Technology – consider the following four case studies from Fortune 50 companies. Each of these customers are driving digital transformation across their organization by deploying Maana’s Knowledge Platform. These deployments are translating into hundreds of millions of dollars in increased profitability.
Use Case #1: Sharing Knowledge to Mitigate Oil Corrosion Risk

The downstream process of refining crude oil into a finished good involves many potential risks, from equipment failures to unplanned downtime. Corrosion engineers at a global Fortune 10 oil and gas company had gathered a great deal of knowledge about the refining process (for example, the chemical composition of the crude, how different types of crude respond to different environments and how to treat crude to avoid corrosion). But the company struggled to capture their insights and share them with crude engineers around the globe.

The impacts of poor knowledge sharing were significant and costly. Corrosion engineers, for example, are expected to mitigate risks associated with different kinds of crude. But when they encounter a new type of crude that they know little about, they can’t perform a proper assessment, which leads to lost in productivity. This is also problematic because some kinds of crude can cause additional maintenance issues, resulting in costly unplanned downtime and corrosion failure.

To address this issue, the company deployed the Maana Knowledge Platform, which crawled and indexed multiple, unstructured data sources, including refinery incident reports (in the form of word documents and PDFs, for example), information on the physical properties of the crude types and data on characteristics of incidents and refinery demographics. They then built a custom application – or knowledge base – on top of the Maana platform. They leveraged the platform’s natural language processing capabilities to capture knowledge collected from previous engineers and aggregate it in one location.

Now, onsite engineers can easily access and use this knowledge base to identify the types of crude they are working with and understand how to handle them effectively. Using the application’s intuitive user interface, corrosion engineers can easily search for a particular crude and discover all the relevant information related to it, including risks, lessons learned and risk mitigation strategies.

As shown in the figure below, the Maana Knowledge Graph initially created for this use case captured the expertise of subject matter experts for use by all corrosion engineers. Using the various models stored in the Knowledge Graph, the company’s engineers can make decisions that reduce maintenance costs and unplanned downtime. This reusable asset is now being leveraged across the organization to rapidly build additional models for more than ten optimization initiatives across the enterprise – for example, around job safety analysis (to mitigate risk), seismic activity analysis (to understand environmental impacts) and incident reporting (to help automate this process).
Use Case #2: Minimizing Insurance Policy Risk

Making a decision based on partial information can lead to bad judgement calls – a fact that a Fortune 50 insurance company learned the hard way. Its team of field underwriters have to make early decisions on policies, but they were forced to do so without all of the information needed to make informed decisions, as the company was only collecting partial loss-run reports, which were then stored in various systems. At the same time, technical underwriters were manually entering the loss-run reports into the various systems, which increased the chance of data entry errors.

Management wanted to automate some of the tedious, time-consuming tasks performed by technical underwriters, especially when they are evaluating 2-3 years of loss-run reports and policy documents. By investing in an optimization project with Maana, they hoped to shorten the technical underwriting decision process by five days.
Using the Maana Knowledge Platform and leveraging its DocAssist AI algorithm, the underwriters were able to extract all of the loss-run reports related to the underwriting process from multiple data silos. The reports varied in format, ranging from Excel spreadsheets and Microsoft Word documents to un-encoded PDFs. To extract data from the PDFs, the platform used optical character recognition to read them, which then enabled the underwriters to look for information about previous carriers, term dates, incident dates and costs.

By scanning each document, the Maana Knowledge Platform enabled this insurance company to automate the collection of data on loss-run incidents, dates, and costs for the same carrier and customer. This saved time and minimized data entry errors. Each variable was classified so that underwriters could now search and discover information quickly and easily using the new Knowledge Graph. Now, this insurance company can answer complex questions such as:

- What are similar cases we have insured in the past, and how did we price them?
- Who were the insurance customer’s previous insurance carriers?
- What was the carrier’s policy term?
- What was the carrier’s deductible?
- What was the previous term’s coverage?
- What was each accident’s loss?
- What was the adjuster’s accident description?

Figure 3: Maana Helped Reduce the Technical Underwriting Decision Process by Five Days
Use Case #3: Saving Millions on Logistics Optimization and Contingency Management

For a leading shipping company, each port omission decision can cost the company several hundreds of thousands of dollars. Given that the company has to make thousands of port omission decisions every year, the costs add up quickly. Using the company’s prior systems and processes, it was taking people about six hours to make one port omission decision, as they had to manually take into consideration a wide range of variables such as the customer involved, cargo sewage, schedules, bunkers, land-line shipping, and port and vessel information. Management wanted to reduce the time it took people to make these decisions – and do so without compromising outcomes.

Using Maana’s Knowledge Platform to Reduce Decision Time by 99.7%

Using Maana’s Knowledge Platform to facilitate collaboration amongst the operations and port logistics experts, this major transportation company mapped the key decision points of port omission, using cost as the driver for decision logistics. The Maana Knowledge Platform was used to create a simulation model of the port omission and re-routing decision process using data from key systems such as data on vessel schedules, RKEM container moves, equipment management, and bookings. This simulation model scores all possible re-routing options based on time and cost and generates recommendations based on the most optimized shipping re-route.

To enable this simulation model, the Maana Knowledge Platform:

- Crawled, extracted, parsed, and indexed core entities and data elements from key data systems (such as cargo, ship, vessel, port, and priority) for the port re-routing decision process
- Created a simulation model using variables with different weights, such as perishability of the cargo or cargo classification (for example, military or a premium customer)
- Illustrated the time and cost impact of each re-routing decision using the simulation model
- Listed all recommended contingency re-routing options within the simulation model
- Ranked contingency options by their business impact score
- Calculated the time and cost impact of each re-routing decision
In this way, the Maana Knowledge Platform provides a knowledge model that offers a unified view of multiple data sets and enables faster decision making. As more data inputs are added to the model, the Maana Knowledge Graph grows, learns and adapts, enabling it to support new simulations for cargo to be discharged – for example, so decision makers can determine the costs of different decisions given various constraints (such as commercial, regulatory, cargo, and other constraints). As a result, the company can trust that the Maana Knowledge Graph will always recommend the best alternatives – which has been defined as what will have the least impact on overall cost and transit time.

Most importantly, the company was able to realize its goal of reducing port re-routing decision time from 6 hours to 60 seconds – a 99.7% time savings – while optimizing decisions and outcomes. The potential financial impact of this time savings is expected to be in the hundreds of millions of dollars (see Figure 4).

**Figure 4: Maana Optimizes Port Omission Decision Making**

**Use Case #4: Improve Accounts Receivable Collections by 65%**

A division of an industrial Fortune 50 company wanted to improve its working capital and reduce outstanding invoices, which totaled over $800 million. The company’s finance team used the Maana Knowledge Platform to analyze over five years of invoices to uncover hidden patterns and correlations, as well as identify specific recommendations that would reduce days sales outstanding.
As shown in the figure below, the Maana Knowledge Platform crawled and mined data related to over one million invoices across a wide range of business silos, including historical data (such as open, closed and disputed invoices, collector logs and customer loyalty information) and external data (such as customer credit ratings, the price of oil and interest rates). Maana also used the time value of money as part of its analysis.

After creating and evaluating several data models using the Maana Knowledge Platform, the company was able to accurately predict the likelihood of late payments before invoices were actually due, as well as identify the root causes of late payments, which included:

- **Weekend due dates:** The analysis showed that any invoices with due dates of Saturday and Sunday were always late.
- **Lack of familiarity with invoices for first-time customers:** The majority of first-time invoices were usually late by 90 days because the customer did not understand their invoice.
- **Customer satisfaction:** Many late invoices were attributed to service issues that had not been addressed and required customer service follow-up, not a collection call.

Using the insights gained through the Maana Knowledge Platform regarding the root causes of late payments, the company created a customized call list for each collection agent; this call list was incorporated into the organization’s AvantGard GETPAID collection system.

As the Maana Knowledge Graph learns and adapts over time, it provides ongoing, data-driven recommendations regarding which customers should be called and when. For example, at one point, it recommended that accounts payable call all new customers ten days prior to their invoice due dates to ensure they understand their invoice and get questions answered.
After just 30 days of operationalizing recommendations like this one into GETPAID, the Maana Knowledge Graph and machine learning algorithm continues to learn, adjust and fine-tune insights and recommendations based on daily data input on open and closed invoices, collector actions and stock market changes. For example, the platform recently identified four groups of customers as consistently late payers, as well as specific strategies that the company can take to mitigate future late payments:

- **First-time customers:** The Maana Knowledge Platform recommended that finance make a courtesy call to these customers to ensure they understand their invoice and can ask questions at least 10 days prior to invoice due dates.

- **Customers with unresolved service issues:** The Maana Knowledge Platform recommended that the finance department call customer service to ensure open cases are resolved, as most customers with unresolved issues will not pay.

- **Institutional Customers:** These customers had contracts with longer net payment terms, so accelerating collections would require re-negotiating the contract terms.

- **Other:** Accounts receivable clerks should call all other customers with late payments for other reasons.

By operationalizing all of these recommendations, the company improved A/R collections by 65% over the prior year, which increased working capital by $520M per year.

**Learn More**

Now that you’ve learned how some of our customers are using the Maana Knowledge Platform to drive digital transformation across their organization and accelerate profitability, contact us to see how you can use it to benefit your organization. Learn more by contacting us at sales@maana.io