

# Komatsu achieves breakthrough performance gains and savings with Azure SQL Database Managed Instance

## KOMATSU

**Customer**  
Komatsu Australia

**Partner**  
TimeXtender

**Products and Services**  
Azure  
Azure Analysis Services  
Azure Databricks  
Azure SQL Database Managed Instance  
Power BI

**Industry**  
Manufacturing

**Organizational Size**  
Large (1,000 - 9,999 employees)

**Country**  
Australia

Komatsu builds and sells a lot of heavy equipment, but the company knows that it takes more than machines to be successful. Using data to gain a better understanding of its own business—and to help customers better understand theirs—is key to developing innovative services and leading its industry. By moving mainframe applications to Microsoft Azure SQL Database Managed Instance, Komatsu Australia is improving performance, reducing costs by half, and providing employees and customers with the data they need, when they need it.

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—Nipun Sharma, Analytics Architect, Business Technology and Systems  
Komatsu Australia



Construction is an extremely data-rich industry—in Australia alone, Komatsu has more than 30,000 machines in daily operation that stream data on productivity, machine condition, and other factors. With so much data in play, the company needs highly efficient tools to aggregate it, make sense of it, and deal with any exceptions. So Komatsu considers data and business intelligence initiatives key to the company's success.

“The fuel for innovation and digital disruption in our business and our industry is data,” says Todd Connolly, General Manager, Construction Solutions at Komatsu Australia. “But data itself is not enough—we need to turn that data into actionable information like recommendations on when to replace parts to optimize machine operation. We aim to differentiate ourselves as a company that uses data to help our customers do their jobs better, increase productivity, and get the highest possible return on their investment in Komatsu machines.”

## From smart construction to smart business processes

Since its founding nearly 100 years ago, Komatsu has provided its construction, mining, and industrial machinery customers with innovative products, services, and solutions, with a goal of achieving *omotenashi*—an unrivaled level of quality and reliability. The company operates on six continents, where it seeks to improve the safety, environmental performance, and productivity of its customers' job sites with industry-first smart construction technologies like drones and unmanned bulldozers.

Komatsu Australia has embraced all aspects of digital transformation using analytics and other cloud technologies. “We take a 360-degree view of our machines, which provide a great deal of information,” says Connolly. “We also operate our own off-laboratories where we take a deep look inside every component to make predictive maintenance recommendations. We combine this with physical inspection data to make the most valuable suggestions to our customers.”

Managing and making sense of all this data requires a robust IT backbone, and Komatsu Australia was starting to feel the pain of aging mainframe-based applications. The company wanted to modernize its infrastructure by moving away from the mainframe mentality.

“We had multiple mainframe applications for different types of data, and we needed to consolidate them into a single system so that different parts of our organization can easily get a holistic view of data from different sources,” says John Steele, General Manager, Business Technology & Systems at Komatsu Australia. “This consolidation also makes it possible to import that data into platforms where we can work with it in ways that we couldn't do on a mainframe. The accessibility and visibility we have now makes it possible to perform advanced analytics and extract more value from the data.”

## A platform for greater business intelligence

To create a unified data estate, Komatsu Australia wanted a solution that would work well with its existing applications and also provide an easy interface for data modeling and organization. Komatsu Australia chose TimeXtender Discovery Hub, which includes a powerful, built-in adapter for Microsoft Dynamics AX—which Komatsu currently uses—and offers a graphical user interface for data management. Discovery Hub runs on the Microsoft Azure cloud platform—an additional benefit, given Komatsu Australia's existing Microsoft investments and cloud strategy.

“We like what we see with all the current Azure services, and we're looking at moving more of our IT resources to the cloud—including migrating to Microsoft Dynamics 365,” says Steele. “As more Azure services become available, we can tap into them more easily if we're already in the cloud rather than running on-premises systems.”

After evaluating available deployment options, the company chose [Azure SQL Database Managed Instance](#) to optimize performance for its large volumes of data. With Azure SQL Database Managed Instance, Komatsu Australia can easily lift and shift on-premises applications to the cloud and take advantage of Azure platform as a service (PaaS) capabilities like automatic patching and version updates, automated backups, high availability, and reduced management overhead. Komatsu Australia also benefited from a low migration effort due to the high degree of compatibility of Azure SQL Database Managed Instance with Microsoft SQL Server, plus the strong security and fast, safeguarded connections to key data sources on-premises that it gained with Azure Databricks.

As the repository for all the data, Azure SQL Database Managed Instance has become a single source of truth across Komatsu Australia. The company uses Discovery Hub to do its extract, transformation, and load operations. It publishes the data in [Azure Analysis Services](#), where that data is available for reporting and analytics, giving employees access to all relevant data from multiple sources—all the data they need to give customers the best possible service.

“We have 1.5 terabytes of data and that number is growing fast—we currently process around a million records per day—and we determined Azure SQL Database Managed Instance was the best choice for us in terms of scalability, cost, and performance,” explains Nipun Sharma, Analytics Architect, Business Technology & Systems at Komatsu Australia. “We moved our entire database and the Discovery Hub analytics implementation to Azure SQL Database Managed Instance in less than two weeks, and since then we've seen a 49 percent cost reduction and 25 to 30 percent performance gains.”

Those gains have a direct impact on day-to-day operations. “Our employees depend on having the latest data available to do their jobs, and now we're able to get them that data more quickly,” says Sharma. “And because our processes run faster now, we can do them more frequently—instead of just running a single data load early in the morning, we run another load in the middle of the day to update logistics data on parts and service sales along with inventory transactions and stock levels.”

Employees now access logistical data more easily and have greater confidence in its accuracy. “Prior to setting up Discovery Hub and Azure SQL Database Managed Instance, logistical data was managed on an ad hoc basis by different people across the company, creating real potential for data errors,” says Steele. “Now we have a single consolidated source of truth that everyone uses, and we can increasingly automate our analysis for a deeper dive into the intricacies of the data. We simply didn't have that capacity before. Having a single platform has really helped us clean up our data and understand it better.”

Easy access to current, trustworthy data also enhances decision making, as Sharma explains. “We used to run a stock report once a week on Saturdays, because it took 8 to 10 hours—we just couldn't do that on a weekday,” he says. “Now that employees have data available on a daily basis, they can analyze it and better manage and move around inventory in response to market and customer needs.”

## Tools for easily understanding data

After establishing the robust solution layer for data analysis, Komatsu Australia needed a tool for visualization and presentation. The company evaluated potential solutions and decided that [Microsoft Power BI](#) was the best fit for its needs. Business teams that already used Microsoft Excel and Power Pivot particularly appreciated the easy transition to Power BI. “The data from our Azure SQL Database Managed Instance is used across the organization using Power BI dashboards and visual analytics,” says Sharma. “This gives our employees access to information from our data warehouse across multiple dimensions in a very seamless fashion.”

Komatsu Australia plans for its new tools to extend beyond streamlining processes within the company. It also wants to use its business intelligence platform to enrich the information available to its customers. Customers already use telemetry data from Internet of Things (IoT) sensors to help manage their fleets. Next on the agenda is to serve up telemetry data and other data sources through an online portal to give customers greater visibility into their fleets.

“We want to increase our customers' self-service capabilities, making it easy for them to get information like service history, equipment alerts, and the number of hours a piece of equipment has been operating. Unlike a car, it's the number of operating hours rather than the mileage that dictates the service cycle for construction equipment,” says Steele. “Customers regularly log into a customer portal, and we want to deliver analytics through the portal experience they already know. We're looking at using Power BI to provide full visibility and analytics within the portal.”

## A point of difference in an industry full of data

With Azure SQL Database Managed Instance, Discovery Hub, and Power BI, Komatsu Australia has taken great strides toward its goal of using data insights and business intelligence as a market differentiator that keeps it ahead of the competition. “We deal with such large volumes of data that we need fast, easy, and robust solutions in place to make sense of it,” says Connolly. “We don't want to have rooms full of business analysts processing and reviewing the data, so we use Microsoft and TimeXtender solutions to provide our employees and customers with the right data at the right time and in the right place.”

Future possibilities for Komatsu Australia include using AI to incorporate predictive analysis into its business intelligence platform. Its data scientists currently work on predictive models based on equipment telemetry data, and the company hopes to apply the same sort of processes and methodologies to business data as well. Komatsu Australia is also working on expanding access to key information through mobile apps and desktop apps to put data even more at the center of the business and provide it to the employee or customer who needs it, when they need it.

Komatsu Australia anticipates that its technology choices will serve the company well for many years to come and could be rolled out to the global business. “When we select technology tools for our company, we want something that can grow with our business at enterprise scale,” says Steele. “That's why we have a great level of comfort working with Microsoft. We trust that Microsoft solutions will be technologically advanced, supportable, and maintainable and that they'll continue to meet our business and technology needs moving forward.”

## Technical addendum: Building a holistic analytics solution in the cloud



Komatsu Australia has built a holistic data management and analytics solution with TimeXtender's prebuilt adapter for Dynamics AX, Azure SQL Database Managed Instance. TimeXtender's prebuilt adapter for Dynamics AX makes it easy to extract data out of Dynamics AX and deposit it into a data model hosted in Azure SQL Database Managed Instance. The system further transforms the data and aggregates it into tabular models aligned to business use cases with Azure Analysis Services. The resulting high-quality data is then served to business users via Power BI.

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