



Guangzhou Metro leads China's transformation to a mass transit society

Overview

The Need

Guangzhou Metro needed to transform the way it managed its swelling base of assets to extend their life and maximize rider safety and convenience.

The Solution

Guangzhou Metro worked with IBM to deploy an integrated asset management solution flexible enough to track assets across the lifecycle.

What Makes it Smarter

Guangzhou Metro has the means to conduct predictive maintenance of its fast-growing assets—before breakdowns occur—ensuring a smoother, safer and more reliable experience for its two million riders.

The Result

“Our goal is to turn the public transportation system into an environmentally friendly, intelligent and digitalized transportation system. With IBM's technology and expertise, we've put ourselves on the pathway to realizing that vision.”

– Ding Jianlong, general manager,
Guangzhou Metro

In the midst of an economic transformation that is unprecedented in both scope and complexity, China has taken center stage in the world economy. China became the world's third-largest economy (behind the United States and Japan) on the strength of its rapid, export-driven growth. Of the many byproducts of China's rising economic tide, perhaps the most evident is the growth of its cities. Drawn by the promise of prosperity, China's citizens have flocked to the fast-growing industrial cities that dot the country's coastal region. In addition to overall population growth, the continued prosperity of these cities has led to the emergence and growth of a thriving middle class—a key ingredient for China's long-term prosperity.

While these factors indicate a maturation of China's economy, they also point to a new set of challenges to the country's ongoing development, with traffic congestion at the top of the list. The question isn't whether China's urban citizens will demand more mobility, but how they'll meet that need. The fact that automobile sales have grown nine-fold since 2000 suggests China is at a turning point, with more of its increasingly affluent, urban citizens poised to choose the convenience of private transportation. Recognizing that exploding automobile usage—and the resulting increase in emissions and traffic congestion—pose a direct threat to economic growth and quality of life, the Chinese government is funding massive investments in public transport infrastructure to provide a convenient, safe and efficient travel alternative. Guangzhou, China's third largest metropolitan area and the capital of Guangdong Province, is a powerful case in point.

Gaining control over fast-growing assets

With funding support from the municipal government, Guangzhou Metro, the city's rapid transit system, is undertaking a huge infrastructure build-out designed to double its capacity to four million passengers per day, before the opening of the Asian Games in 2010. The sheer pace of its expansion—combined with the complexity and diversity of its business structure—was making it increasingly difficult for Guangzhou Metro to manage, monitor and maintain the swelling base of assets (rolling stock, track, tunnels and stations) it was putting in place.





Business Benefits

- Increased safety and reliability of the Guangzhou Metro network through predictive maintenance capabilities
 - Extended life of fixed asset investments
 - Improved process efficiency by virtue of asset management and ERP process integration
 - Improved cost efficiency through the coordinated management of parts inventories
 - Improved asset management decision-making through improved information transparency
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To achieve the safety, reliability and efficiency it demanded, Guangzhou Metro engaged IBM to redesign its asset management systems and processes so that assets could be tracked at every stage of their lifecycle—from initial construction to ongoing operations—and plant and equipment maintenance performed on a predictive basis. To further strengthen Guangzhou Metro’s budgeting and decision-making capability, IBM also integrated the company’s asset management and ERP systems. In addition to enabling more efficient processes, this integration provides Guangzhou Metro’s managers with both a financial and physical perspective on asset management decisions that has thus far been elusive.

One measure of the complexity of Guangzhou Metro’s business is the range of ancillary businesses it operates, including advertising, property development, telecommunications and consulting services. A more telling measure, however, takes into account the asset management challenges related to the rapid growth of its core transportation equipment and facilities. In contrast to more mature rail networks, those in high-growth mode—such as Guangzhou Metro—commit a high proportion of their resources to construction, relative to the operations and maintenance sides of their business. As new track, tunnels and stations are brought online, those assets are, in essence, handed off from Guangzhou Metro’s construction business unit to its operations and maintenance units, respectively. Because each of these units had their own systems, processes and even parts taxonomies, maintaining seamless management continuity across these handoffs was not a practical possibility.

Breaking down process walls

IBM’s first step in addressing this was to create a standardized taxonomy for all of Guangzhou Metro’s assets across all business units and processes. Using IBM Maximo® Asset Management and leveraging the

Smarter Rail:

Managing a subway network’s assets intelligently



Instrumented

Every asset in Guangzhou Metro’s network is tracked over its entire lifespan, including servicing guidelines and service history.



Interconnected

Integration of asset management with key enterprise functions improves decision-making and process optimization.



Intelligent

Performing maintenance on a predictive basis extends the life of assets, improves uptime and supports a rapidly growing passenger base.



Solution Components

Framework

- IBM Component Business Model

Software

- IBM Maximo® Asset Management
- IBM Maximo Enterprise Adapter

Services

- IBM Global Business Services
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new asset taxonomy, IBM Global Business Services designed and implemented an integrated asset management solution that can be extended to all of Guangzhou Metro's business units, and has the capability to manage assets throughout their lifecycle. A key attribute of the solution is the integration (via IBM Maximo Enterprise Adapter) of asset management functions with key enterprise applications like procurement, financial management, inventory management and materials management. Prior to this, the separation of these functions created an inherent inefficiency by erecting a virtual "wall" between processes that would—in an optimal setting—be linked in a coherent workflow. On one side were the processes and systems that tracked and forecasted plant and equipment maintenance requirements, on the other was Guangzhou Metro's ERP system.

The effect of this partition was twofold. First, it deprived Guangzhou Metro of the comprehensive and consistent picture of its asset management requirements—incorporating both physical and financial perspectives—it needs to efficiently manage the funding and execution of the project. Second, it posed a major barrier to achieving the process efficiency Guangzhou Metro needs to keep its trains running and get the most return from its investments. Using the new solution as a foundation, IBM Global Business Services also employed the IBM Component Business Model framework to assist Guangzhou Metro in the optimization of its asset management processes. As a result of its process and data standardization efforts, Guangzhou Metro was also able to consolidate its procurement activities into a single organization, running on a single system and serving the entire enterprise. In addition to lower administrative costs, the company also expects major improvements in the management of its parts inventories and better pricing via volume-based discounts.

As the Guangzhou Metro network continues to grow, its asset maintenance obligations—along with safety risks—grow along with it. With this new solution in place, Guangzhou Metro is far better able to meet these obligations, keeping its passengers safer and its network more reliable. A big part of this capability is a move from reactive to predictive maintenance. By tracking and monitoring assets at every stage of their lifecycle, Guangzhou Metro expects to maximize the lifespan of its assets, thus ensuring that the municipal government's funding produces the maximum benefit in promoting the adoption of public transportation and the minimization of traffic congestion.

Going forward, the increased transparency afforded by the new solution provides Guangzhou Metro with the ability to make better decisions regarding future asset investments as the company drives to double the length of the network to 235.7 kilometers by next year. With each kilometer of network costing more than \$60 million to build, the potential benefits from making the right investment decisions are enormous.

"The continued growth and success of Guangzhou depends on its ability to control traffic congestion in the coming years. The safety and reliability of Guangzhou Metro's network is essential to achieving this."

– Ding Jianlong

Safety in the spotlight

In the meantime, Guangzhou Metro general manager Ding Jianlong has his eye on a closer milestone—the 16th Asian Games to be held in Guangzhou in 2010. Ding believes that the Games will be a showcase for the world-class safety, convenience and efficiency Guangzhou Metro aspires to achieve. “Our goal is to turn the public transportation system into an environmentally friendly, intelligent and digitalized transportation system,” says Ding. “With IBM’s technology and expertise, we’ve put ourselves on the pathway to realizing that vision.”

For more information

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