

Prospects for OS&M Business in Hitachi's Railway Business

Two years after presenting the new vision of Hitachi's railway business in 2018, Hitachi's Rail Systems Business Unit remains on track to deliver a single, dedicated global OS&M organisation. The re-alignment enables OS&M to respond to the changing needs of the rail market and accelerate the integration of products and services Hitachi provides with digital capabilities and technology. The new OS&M organisation combines global activities and resources in S&M for rolling stock equipment and signalling installations with its O&M business including turnkey, signalling infrastructure, vehicles, buildings, and facilities. OS&M organisation works in close collaboration with regional sales and project units to present one face to customers and strengthen its approach as a full service provider.

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1. Introduction

The integration of Hitachi's railway business began in 2015 with the acquisition of Ansaldo Breda S.p.A. and Ansaldo STS S.p.A. With these acquisitions, Hitachi expanded its portfolio of products and services, strengthening its turnkey capability, as well as the capability for signalling and traffic management systems. In 2019, Hitachi's Rail Systems Business Unit (RSBU) began a study into the new organisational model and identified significant benefit in the creation of a single operation, service, and maintenance (OS&M) organisation. Further integration presented an opportunity for Hitachi to enhance its offering for customers, to strengthen its culture and collaboration across regions, and to improve profitability and align with market leaders and competitors.

After touching on the new organisational model, this article presents some of the key projects the OS&M organisation delivers around the world, along with an insight into some of its innovation projects and future challenges

as the organisation adapts to meet the demand for faster, cleaner railways.

2. Integrated Global Organisation

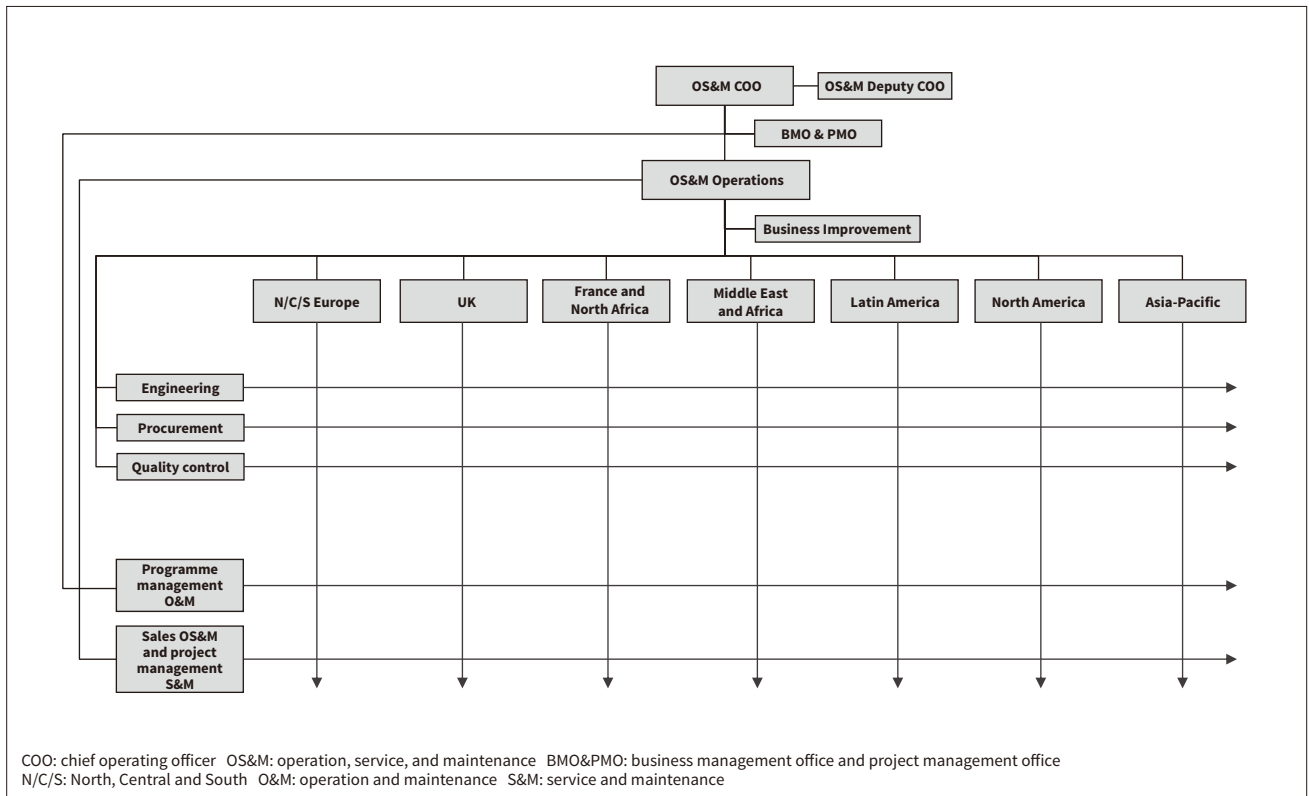
As a fully integrated unit and profit center, the new OS&M organisation structure includes global functions for business development, bids, sales, programme management, procurement, quality control, and maintenance engineering. These functions support a global operations structure to manage service delivery in the local markets (see **Figure 1**).

The key principles of the new OS&M organisation structure include:

- (1) Global leadership of "commercial and programme management."
- (2) Regional leadership for "customer focus" and "execution"
- (3) "End-to-end" interaction between OS&M provider and design and build (D&B) team.
- (4) Delivery responsibility for operation and maintenance (O&M) and service and maintenance (S&M) via the project-based organisation.

Figure 1 – OS&M Global Organisation Model

This figure shows the rebuilt OS&M organisation chart of Hitachi's railway business.



(5) Local O&M and S&M resource management under an integrated organisation with rolling stock, and signalling and turnkey experts.

(6) Procurement, supply chain, quality, and engineering with regional resources under joint global management to drive efficiency and integration of standards and processes.

2.1

OS&M Market Overview and Perspective

RSBU continues to deliver major projects across the globe, demonstrating the breadth of products and geographical areas in which OS&M operates (see **Figure 2**). The key challenge for RSBU now is to increase its business share by identifying and pursuing new opportunities in emerging markets, leveraging expertise gained through acquisition of other companies and the new dedicated and integrated OS&M organisation model above.

For the O&M market, unlike the traditional rolling stock and signalling sectors, providing core services; the operation of control centers, fare collection, facilities management, infrastructure maintenance, station operation, and customer care are more important. The breadth of services presents significant challenges for OS&M and explains the level of competition in this market. The three main categories for competitors are:

(1) Global operators (“O&M pure players”): major operators with international presence; operating and maintaining

bus, metro, tram, commuter systems across the globe.

(2) Rolling stock and systems providers: delivering maintenance services in addition to rolling stock products and contracts.

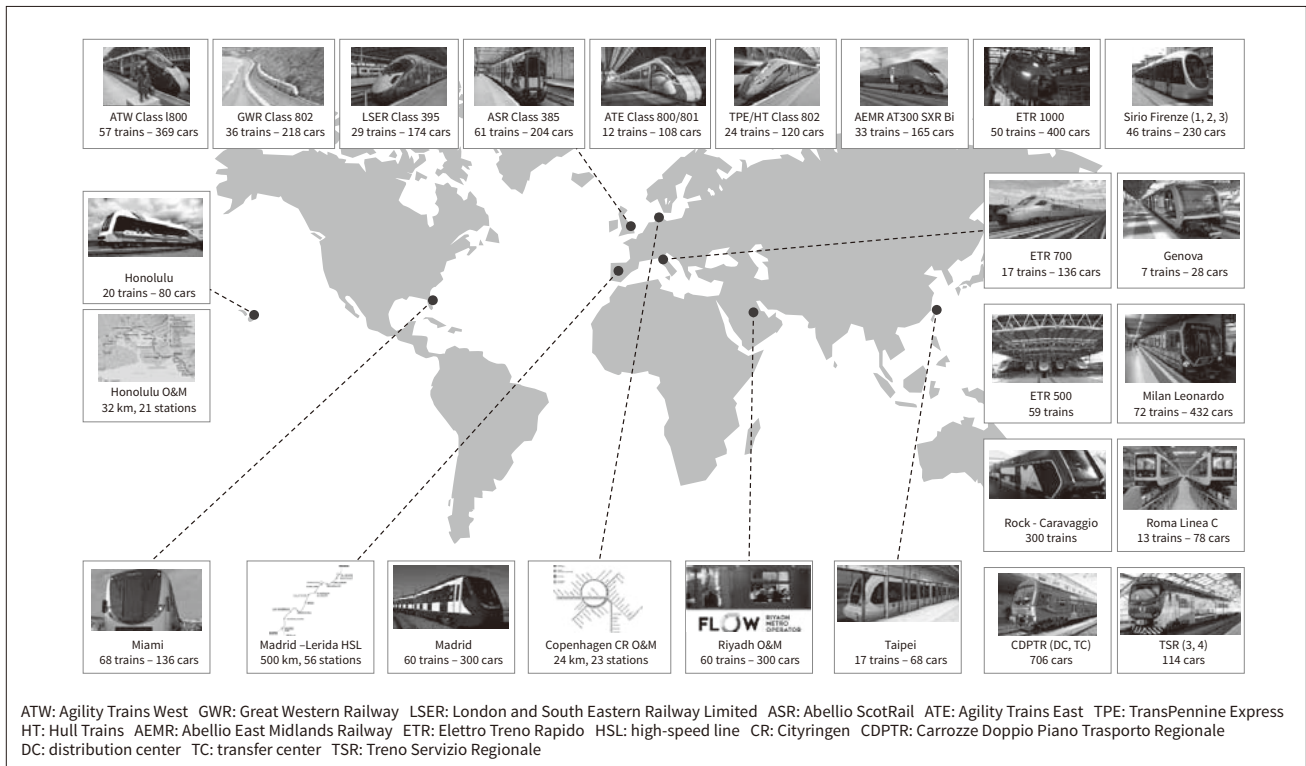
(3) Services providers: global or local industrial companies focused on delivery of maintenance services.

To meet these challenges, Hitachi's OS&M organisation are strengthening its position in the O&M market around two axes: the green-field driverless (grades of automation 4: GoA4) metro project and Hitachi's traditional signalling systems and rolling stock maintenance services. At the same time, its O&M experiences on Copenhagen Metro in the Kingdom of Denmark and Riyadh Princess Noura bint Abdulrahman University in the Kingdom of Saudi Arabia are being used to develop capability in automated driverless metro systems such as Riyadh Metro Line 3 to Line 6, Metro de Lima Line 2/Line 4 in the Republic of Peru, and Honolulu Light Rail Transit (LRT) projects in Hawaii, USA.

To facilitate further growth, Hitachi's OS&M organisation intends to build on its unique position as the only operator able to provide rolling stock, signalling and turnkey; making key decisions around the maintenance of non-Hitachi rolling stock, the operation of high-speed lines or monorails and investing in open innovate projects. If successful, these projects present exciting opportunities in new markets and regions.

Figure 2 — Major OS&M Project Delivery around the World

Hitachi's Railway Systems Business Unit is developing a number of OS&M projects around the world.



2. 2

Continually Improve Fleets KPIs

Changes to the structure of markets such as O&M require RSBU to accelerate its rate of improvement. Under its new business structure, RSBU intends to re-orientate core activities towards the environment in which its customers operate, seeking greater collaboration in areas of performance reporting, governance, and information. OS&M

efforts with regard to these changes are described below (see Figure 3).

2. 3

Reducing Life-cycle Cost: Lumada Applied to Railway Maintenance

The process of digitisation makes it almost impossible for OS&M to deliver maintenance services without the

Figure 3 — OS&M Approach to Improve Fleet KPIs

The figure shows four points on which the Railway Systems Business Unit will work on to improve its response to changes in the O&M market.

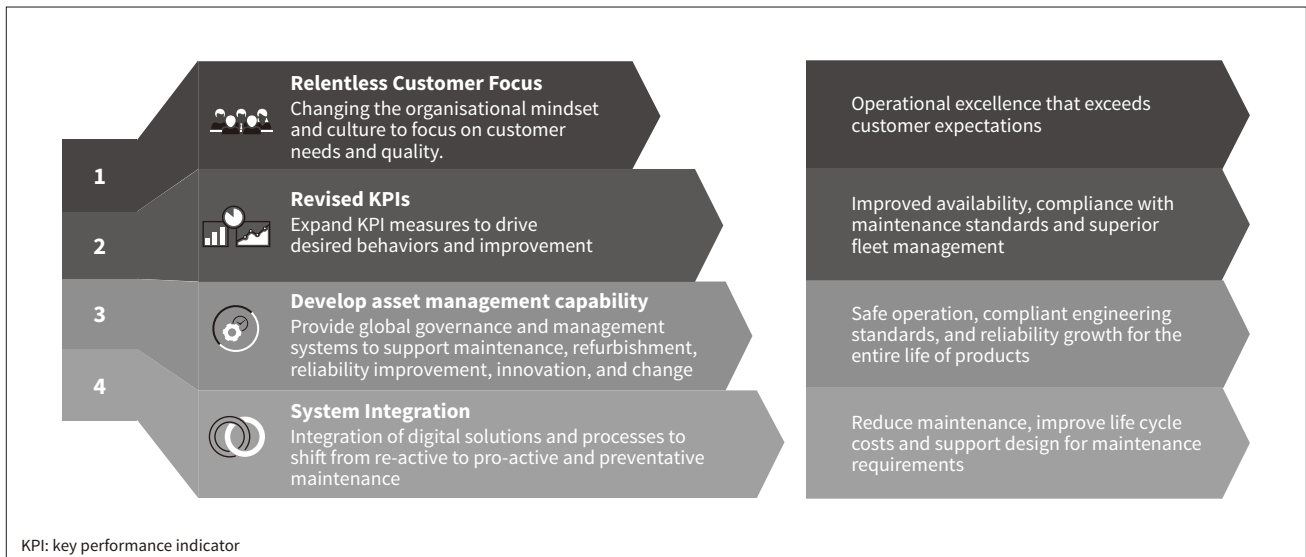
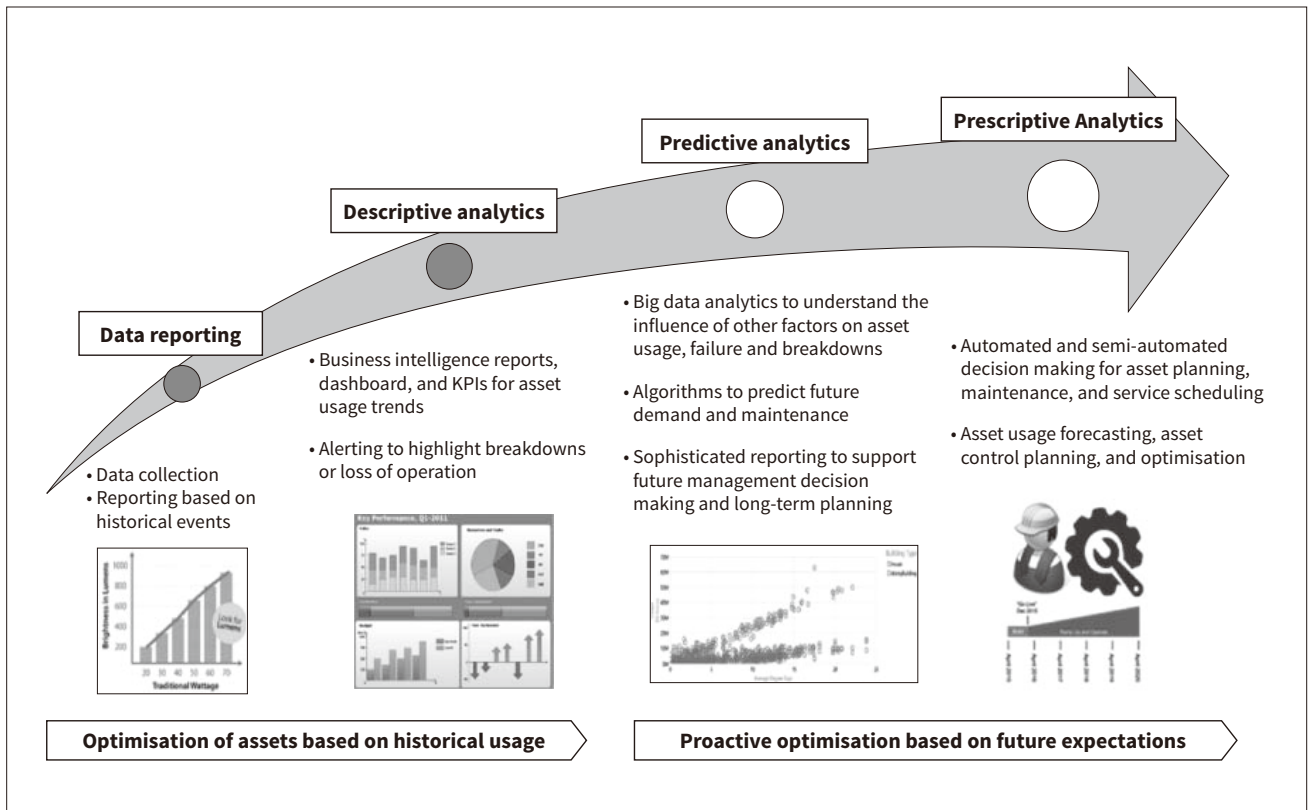


Figure 4 – OS&M Roadmap for Predictive Maintenance and Data

Maintenance optimisation is achieved by evaluating the usage rate of parts based on the usage history, automating inspection procedures, and providing information on prescriptive maintenance and maintenance activities.



support of the Internet of Things (IoT), conditions based maintenance (CBM), predictive maintenance and data science^{(1), (3)}. In 2019, the integration of rail business departments allowed the OS&M organisation to reorganise its S&M technology area, merging system domain competences with data science and IT technologies expertise.

To help it on this journey, the OS&M organisation developed a roadmap for data and diagnostic rules allowing Hitachi to optimise maintenance by measuring component usage, automate inspection procedures, and inform prescriptive maintenance and servicing activity (see **Figure 4**). Leading to savings in lifecycle costs and enhancing collaboration with its customers and suppliers. In the recent analysis across UK, IT fleets predicts significant reduction in the maintenance of pantographs, heating ventilation, and air conditioners (HVACs) and generator units fitted to bi-mode multiple unit trains.

Along with a variety of wider individual technologies such as Lumada, big data, and global product lifecycle management (GPLM), the OS&M organisation is also developing a common monitoring platform under Project Phoenix. Launched in 2019, Project Phoenix will see OS&M merge key asset monitoring capability formerly developed for the UK and Italian markets to optimise CBM capability on new fleets between 2021 and 2022.

2.4

Increase Control over Supply Chain

Against the backdrop of challenging markets, the OS&M organisation is focusing on the optimisation of its supply chain operations – utilising Hitachi operations globally and promoting local procurement or local production to best support geographical areas. As a fully integrated unit and profit centre, the supply chain model needs to be intelligent and agile enough to compensate for the short-term demands of corrective maintenance, whilst leveraging longer-term activity such as overhaul, modification programmes, and warehousing operations to ensure value for money.

To enable this, OS&M and rolling stock reorganised itself in February 2019 to form a dedicated OS&M procurement unit responsible for purchasing, contracting, and order handling. At the same time, it retained a close relationship with global procurement to focus on collaboration and standard working practices going forward. With restructuring complete, the OS&M procurement and supply chain focus is now on utilising advancements in digital capability to inform inventory management and to identify potential insourcing opportunities. OS&M supply chains will transform over time and use data to identify issues in re-ordering and the management of warehouse operations solutions. Reducing waste and optimising inventory costs will also inform future sales and bids.

OS&M has a number of initiatives already underway concerning whether to manufacture the parts necessary for repairs in-house or to use purchased products, ranging from promoting local production to shorten repair time, to full-scale maintenance projects – particularly in regions with underdeveloped markets. OS&M continues to work closely with global procurement, particularly around full maintenance projects such as the Intercity Express Programme (IEP) contract in the UK. It is imperative that the organisation develops human resources long term and work with strategic suppliers to strike a balance between “insourcing” and “outsourcing.”

3. Conclusions

Global transformation of OS&M and Hitachi’s railway business began with the reorganisation into a fully integrated unit and profit center. To make a success of this, OS&M now intends to consolidate its unique position as a full service provider by utilising its operational background in mass transit systems to access transit systems S&M markets, through opportunities in operator markets, and by developing digital capability to become a market leader in asset management.

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