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ALIGNING ORGANIZATIONAL STRATEGY FOR MAINTENANCE 4.0: A McKINSEY 7S ANALYSIS OF MRT JAKARTA'S RAILWAY INFRASTRUCTURE MAINTENANCE DIGITAL TRANSFORMATION

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Abstract

This paper is researching on the readiness of MRT Jakarta's Railway Infrastructure Maintenance (RIM) Division to improve its level of maintenance, through alignment of organizational strategy with digital transformation. The reliability of equipment is the key for successful Urban Metro, therefore MRT Jakarta is looking to transition from reactive and preventive to predictive, data-driven maintenance. Drawing on the McKinsey 7S framework with Maintenance Digital Transformation (MDT) elements, the research assesses digital readiness in seven dimensions: Strategy, Structure, Systems, Shared Values, Skills, Style, and Staff. A mixed-method approach was adopted, including quantitative surveys and qualitative interviews to determine maturity and pinpoint key areas of weakness. Findings indicate moderate maturity in the majority of dimensions, areas of weakness found in digital system integration, leadership commitment, and staff skills. The paper outlines the Digital Transformation Acceleration Program (DTAP), the structured guide that highlights system automation, integration between departments, and digital competency building. The findings highlight that digital transformation is not merely about technological improvements but demands overall synergy of human, technical, and strategic resources. The study provides tangible insights into action for public infrastructure agencies looking to upgrade maintenance functions and realign internal capabilities to new digital standards.

Keywords: ***Condition-Based Maintenance, Digital Transformation, McKinsey 7S, MRT Jakarta, Predictive Maintenance***

INTRODUCTION

The era of the fundamental problems at the age of supersaturated (megacities, urban population density level) urban railway systems to ensure high efficiency, reliability and cost effectiveness, are getting higher and higher. The Mass Rapid Transit (MRT) system in Jakarta, the first of its kind in Indonesia, is essential in meeting those public mobility vital issues. As the operating envelope broadens, the need for assured asset performance combined with the control of operational expenditure becomes a strategic requirement. The Railway Infrastructure Maintenance (RIM) Division of MRT Jakarta holds this responsibility, yet its maintenance process is largely manual and disparate, relying mostly on printed reports and siloed solutions.

Worldwide, the development toward Maintenance 4.0, based upon Internet of Things (IoT), Artificial Intelligence (AI), and real-time analytics, has moved the nature of maintenance from a reactive to predictive and condition-based setting (Jasiulewicz-Kaczmarek et al., 2020; Verhoef et al., 2021). MRT Jakarta has launched a digital transformation program, including the implementation of the SAP ERP, but it also has some difficulties to completely align the organizational structure and the process to the digital strategy. These difficulties are a lack of integration for the PDCA cycle, the inconsistencies in reporting data and the less digital competency of employees. The McKinsey 7S model is used to measure the readiness of digital transformation and to recognize the shortcomings in the strategy, system, style, and skill levels that restrict transformation. It recommends a planned roadmap towards accelerating alignment, promoting leadership and fostering the digital resilient maintenance ecosystem for MRT Jakarta.

LITERATURE REVIEW

Digital Transformation in Business and Maintenance Functions

The digital transformation has completely reshaped the traditional business model. It is a new way of adding value to customers through digital means, and many times overwriting older operational processes. Baalmans et al. (2022) note, digital transformation empowers organizations to create entirely new models based on digital technologies, businesses have to rethink how they run, create value, and engage with their clients. These virtual models are not just technological layers, but systemic shifts that transform what it means to be a competitively differentiated organization. The study by Gradner et al. (2019) is in favor of this interpretation and stresses that the transition is a fundamental organizational change, provoked by a
stronger impact of digital technologies on customer experience and market.

In addition, Andal-Ancion et al. (2003) highlight that the realization for firms is that they need to change in a digital world not simply by adopting new tools but by accepting a new structure and culture. These consist of embracing a team spirit and a human-centric attitude to business, which are both drivers for extracting the most value from digital solutions. The same as, Verhoef et al. (2021) which describes holistic transformation process, in its various phases it incorporates strategic alterations, technological implementation and the benefit of finding and exploiting its value. It emphasizes the significance of systemic business model innovation such as digital business model and cultural adjustment to digital transformation.

But the path to digital transformation is fraught with complexity and obstacles. Baalmans et al. (2022) observe that organizations often face resistance within, lack of leadership alignment, and confusion on the division of responsibilities, which tend to inhibit transformation. Lucas (2014) also emphasized the significance of organized preparation and effective implementation. Bluntly," technical play" leads digital projects away from their strategic cause, confusing the picture and reducing the business impact of digital initiatives.

Integration and Strategic Alignment

Writers and researchers keep coming back to one point—digital tools don't mean much if they aren't part of the bigger picture. You can't just toss a new app or system into a company and expect everything to change. Agarwal et al. (2010) make this clear that tech must be in line with how things are done in our daily life and tied to the core of how business runs. This is how technology could help us.

What more valuable and important is when digital tools are used to make everyday tasks smoother, help people make smarter calls, and improve how customers are treated. That kind of payoff only comes when the tools are tied directly to what the company is trying to achieve. Lucas (2014) pushes for a practical approach—he says businesses shouldn't just chase the latest gadget or platform. What matters is whether that technology moves the needle. If it doesn't lead to better outcomes, it's just an expensive distraction.

Still, even the best tools fall flat if the company isn't prepared to use them. Being ready means more than having the software installed. It means people must know how to use it, leaders need to back it up, and the whole system needs to support the change. Without the right skills, attitude, and structure, the tech just ends up sitting there, underused and overhyped. When everything lines up—tools, people, goals, you get results. If not? You get tech no one uses, clunky systems, and waste money.

Strategic alignment isn't just a nice-to-have. It's what ties together the company's tools, purpose, and day-to-day work. Without it, companies end up with systems that don't talk to each other, work that gets repeated, and very little return on what they've spent. So, if a company wants to get the most out of digital change, everything has to move in sync—from the boardroom to the front line.

The Role of Digital Culture and Organizational Readiness

Digital change doesn't start with tools—it starts with people. That's why organizational readiness is one of the biggest factors in whether digital transformation actually sticks. Soule and Westerman (2016) talk about something they call "digital dexterity." It's the ability to shift gears fast, both with your people and your tech. Being agile in a digital context doesn't just come with installing new software. Agility in a digital setup doesn't just show up on its own. It takes more than installing the latest tech or updating your systems. Soule and Westerman (2016) call this "digital dexterity"—basically, how fast and effectively an organization can move its people and tools around to respond to changes. But to make that work, leadership has to be solid, teams need to trust one another, and there has to be a culture were trying out new approaches is part of how things are done. But here's the part a lot of places

miss. Verhoef et al. (2021) point out that many transformation efforts fall apart because they focus so much on tech-buying software, upgrading hardware, and tweaking processes—while ignoring the people who use them. That gap becomes even more obvious in public sector settings. There, rules tend to be strict, change comes slow, and staff are used to doing things a certain way. So even if the right tools are there, they might never get used well. To pull off real digital transformation, organizations need more than equipment or platforms. They need to build an environment where people are ready to use those tools—and actually feel supported in doing so.

McKinsey 7S Framework and its Application to Maintenance Transformation

The McKinsey 7S Framework by Peters and Waterman (1982) is an evaluative model of organization effectiveness that consists of seven components: Strategy, Structure, Systems, Shared Values, Style, Staff, and Skills, which are intertwined and need to align for the transformation to be effective. It presents an equal perspective between the elements of the system and human. According to this, McKinsey 7S Framework is a method that could be integrated with the Maintenance Digital Transformation factors by Saihi et al. (2022) to give complete evaluation for the organization Digital Transformation model. They identified and matched MDT enablers to each one of the 7S components, providing an implementable framework for measuring the readiness of an organization within digital maintenance activities.

For instance, Under Strategy, clear digital roadmaps and alignment to business priorities are given prominence. Under Systems, the integration of platforms such as ERP and SCADA is stressed to achieve data access and automation. Under Skills and Staff, workforce training, digital literacy, and workload balancing are cited as critical success factors. Shared Values consist of building the digital culture of collaboration and receptiveness to change to mitigate resistance to transformation. Maintenance Digital Transformation framework (MDT) enhances the McKinsey 7S framework evaluation model by integrating maintenance-specific transformation factors and bringing abstract organizational theory into tangible components that can be implemented by practitioners.

5. Research Gaps and Contribution of This Study

Notwithstanding these improvements, there are various gaps within academic literature. First and foremost, although there exist good examples of combining MDT with organization diagnosis by authors such as Saihi et al. (2022), empirical uses in public railway systems are still scant. Most case studies are in manufacturing business, or private sector. Secondly, for digital transformation most research focuses on improvement on technological systems and not discussing or researching on how internal cultural dynamics, leadership commitment, and communication drive digital transformation success. Third, few studies consider digital transformation at the departmental level of large organizations—like the Railway Infrastructure Maintenance Division of MRT Jakarta—where siloed activities and legacy systems tend to make change difficult.

The gaps identified are covered by the present work through the application of the McKinsey 7S–MDT integrated framework to examine the RIM Division's alignment to the digital transformation objectives. It examines structural and cultural readiness and assesses the maturity in the 7S dimensions as well as suggesting implementable interventions through a Digital Transformation Acceleration Program (DTAP). Connecting organizational theory to the realities of maintenance in public rail infrastructure, the work makes both conceptual and pragmatic contributions to literature.

METHOD

The mixed-methods approach using both quantitative and qualitative data was utilized in this study to assess the digital readiness of the Railway Infrastructure Maintenance (RIM) Division of MRT Jakarta. The design of the study followed the McKinsey 7S Framework and incorporated the Maintenance Digital Transformation (MDT) factors put forward by Saihi et al. (2022) is providing a complete and integrated perspective on evaluation of organizational alignment in strategy, structure, systems, shared values, skills, style, and staff.

Target Audience and Respondents

The target population of the present study comprised employees within the RIM Division at MRT Jakarta, classified according to organizational level: Department Head, Section Head, Maintenance Engineer, and Maintenance Staff. These categories were purposively sampled to reflect both the managerial and operating viewpoints. The sample comprised a total of 68 participants, distributed across each level of the organizational layer to cover insights across the hierarchy.

Materials and Tools

The tools employed within the survey were bespoke survey requirements and interview protocols in coordination with the McKinsey 7S dimensions. The quantitative tool included structured statements rated on the 5-point Likert scale, denoting maturity at Level 1 (Ad-Hoc), Level 2 (Developing), Level 3 (Establish), Level 4 (Advance) and Level 5 (Digital Ready). These were developed to gauge the digital transformation readiness of the organization across the 7S dimensions. For the provision of qualitative information, semi-structured questions were drafted for each level of role to uncover deeper insights into the organizational problems, leadership dynamics, and tool take up.

Design and Performance of Tools

The survey and interview tools were then consolidated through aligning Maintenance Digital Transformation (MDT) drivers to the McKinsey 7S framework. All questions underwent validation at the employee and management level to guarantee the questions were clear and contextually relevant to the maintenance functions. The survey was both sent online and on paper to provide accessibility to all operational units.

Data Collection & Analysis Techniques

Quantitative data were gathered using the Likert-scale questionnaires, and the qualitative data using recorded interviews and open-ended responses. Data was collected within a period of two weeks to provide consistency and follow-ups to ensure full responses. In quantitative analysis, survey responses were averaged using a general averaging approach. For each respondent, the Likert-scale value (1–5) on the respective 7S factors were averaged to obtain overall maturity scores for each of the factors. These were then compared against an ideal digital readiness level benchmark (≥4.0). The results were tabulated and represented as bar charts and maturity scale diagrams.

A thematic analysis technique is used for qualitative analysis. Responses from staff & engineers' level and managerial level are recorded and put into broad categories of Well-Aligned with Digital Transformation, Partially Aligned, and Not Yet Aligned. Interview response keywords and keyphrases were coded and grouped on the basis of whether and how much these were associated with each of the 7S elements. Frequencies of each category were compared to shed greater insight into employee sentiment, leadership perception, and system use.

RESULTS AND DISCUSSION

This section reports the results of the digital transformation readiness assessment completed for MRT Jakarta's Railway Infrastructure Maintenance (RIM) Division through the McKinsey 7S framework. Quantitative survey data and qualitative insights from interviews were analyzed, with data segmented between the different managerial and operational layers and benchmarked against anticipated maturity standards. From the result of the analysis, an action-oriented improvement program could be created which then named as Digital Transformation Acceleration Program (DTAP).

Table 1. Methodological Triangulation Result

7S Element	Staff & Engineers Score	Managerial Score	Expected Score	Key Gap Summary
Strategy	3.1 (Established)	3.4 (Established)	5.0	Execution inconsistent at lower levels; unclear KPIs and roadmap.
Systems	2.8 (Developing)	2.8 (Developing)	4.5	Tools present but underused; integration and training lacking.
Structure	3.2 (Established)	3.0 (Established)	4.5 / 4.0	Role clarity and coordination gaps across all levels.
Shared Values	3.5 (Strong Support)	3.8 (Strong Support)	4.5 / 4.0	Innovation culture exists, but

				promotion inconsistent.
Skills	2.8 (Needs Improvement)	2.8 (Needs Improvement)	4.5	Large skill gaps; urgent need for upskilling.
Style	3.0 (Moderate Leadership)	3.0 (Moderate Leadership)	5.0	Leadership support uneven; weak communication at mid-level.
Staff	3.1 (Adequate)	3.2 (Adequate)	4.5	Staffing imbalances; workload concerns in operational teams.

Under the "Strategy" element of the McKinsey 7S, managers and staff scored 3.1 and 3.4, respectively, indicating moderate strategic alignment. Most of the Lower-level staff (Staff and Engineers) complained with the indication that KPIs for digital transformation is vague and inadequate communication of roadmaps. The execution gaps indicate that though strategy is present, it is not cascaded.

For "System," both staff and managers scored 2.8, indicating digital systems such as SCADA and SAP exist but are not maximized. The feedback indicates there is the need for greater integration and real-time monitoring functionality.

For "Structure," the staff and managers scored 3.2 and 3.0, respectively. Role ambiguity and unclear responsibility were reported, specifically regarding the use and support of digital tools. Cross-department workflows need adjustment.

In the "Shared Values" element, this showed moderately high alignment—3.5 and 3.8 for staff and managers, respectively. While there is a culture of innovation, it is inconsistently promoted, and different departments expressed frustration with the lack of leadership support.

For "Skills," both staff and managers scored 2.8, indicating very low digital competency levels. Interview data indicate an extensive demand for formal digital maintenance system training programs.

On the "Style" element, the effectiveness of leadership was rated at 3.0 for both groups. Most of the Lower level (Staff & Engineers) reported that the leadership is already supportive of the Digital Transformation initiative but noted inconsistent follow-through. Managers acknowledged the need for improved leadership engagement on digital innovation or initiatives. Managers also indicated that there is a lack of digital transformation strategy training, which leads to confusion on Digital Strategy Program implementation

For the "Staff" element, staff scored 3.1 and managers scored 3.2, indicating moderately sufficient staffing. There is an indication of Imbalances in workload allocation especially on handling digital initiatives or improvement and staffing shortages were common themes.

Digital Acceleration Transformation Program (DTAP) Roadmap and Implementation

According to the identified gaps through the 7S analysis, the Digital Transformation Acceleration Program (DTAP) is suggested as an organized roadmap to fill the readiness gaps to facilitate lasting digital transformation within MRT Jakarta's Maintenance Division.

DTAP has four major pillars: (1) System Integration and Real-Time Monitoring, (2) Workforce Development and Certification, (3) Leadership Reinforcement, and (4) Pilot Testing and Ongoing Feedback. Each of the pillar's addresses identified maturity gaps through the triangulated quantitative and qualitative analyses.

Table 2. DTAP Roadmap Aligned with McKinsey 7S Gaps

DTAP Pillar	Focus Area	Targeted 7S Element(s)	Implementation Strategy

System Integration & Monitoring	Tool and platform interoperability	Systems, Structure	Integrate Digital maintenance tools into a centralized dashboard. Enable real-time monitoring and reduce manual processes.
Workforce Development & Certification	Training and upskilling programs	Skills, Staff	Launch certification programs on digital tools. Conduct regular workshops for maintenance teams.
Leadership Reinforcement	Leadership involvement and KPI alignment	Style, Strategy	Embed digital KPIs into leadership performance reviews. Increase engagement in field-level execution.
Pilot Testing & Feedback	Iterative rollout and evaluation	All Elements	Implement pilot projects for digital tools in selected departments. Collect feedback and scale gradually.

The DTAP roadmap is designed so that interventions are not one-size-fits-all but are driven by actual assessments of the organization. By strengthening weak areas in the system, competency, and leadership practices, MRT Jakarta can move as quickly as possible to predictive maintenance and integrated digital operations. Pilot and feedback cycles of implementation will provide room for flexibility and ongoing improvement.

CONCLUSION

The objective of this research was to evaluate the digital transformation readiness of the Railway Infrastructure Maintenance (RIM) Division of MRT Jakarta using the McKinsey 7S framework along with Maintenance Digital Transformation (MDT) elements. As described, the inspiration for the research came in response to improve maintenance level of RIM Division in order to smoothen the integration on maintenance business process (PDCA) to achieve reliable and operational excellence of high-capacity public Transport.

Triangulated analysis integrating quantitative maturity scores and qualitative findings identified areas where, although MRT Jakarta's Maintenance Division has a high cultural inclination towards innovation and strategic awareness at the management level, there are shortfalls in the area of systems integration, skill building, and leadership implementation. The lowest maturity scores were found to be in Systems and Skills, particularly among the engineers and the operating staff. This implies that adopting the technology is just not enough, the organization's alignment, readiness of the workforce, and the leadership are key drivers to transformation.

With these shortcomings in view, the Digital Transformation Acceleration Program (DTAP) was put forward and consisted of four pillars: system integration, workforce training, leadership reinforcement, and pilot-based implementation of feedback. This roadmap provides a step-by-step guide to enhance organizational readiness as well as digital maturity and to deliver sustainable transformation results. DTAP is not corrective in nature but strategic because it offers MRT Jakarta the long-term framework to move from reactive maintenance to an intelligent, predictive Maintenance 4.0 setup. In the future, DTAP implementation should be gradually rolled out with an initial pilot phase in high-impact departments and then iteratively scaled according to ongoing feedback. Certification of the workforce, leadership commitment, and timely system dashboards should be given attention to build transparency, responsiveness, and trust across the organization. In summary, although MRT Jakarta has established the base culture and strategy for digital transformation, there is a need for structured, adaptive, and inclusive implementation planning—like DTAP—to achieve the full potential of Maintenance 4.0. This paper not only

enhances the operational aspirations of MRT Jakarta but is also a diagnostic model for other public transport organizations starting digital maintenance transformation.

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