

A Novel CSAHP Approach to Assess the Priority of Maintenance Work Outsourced by a Metro Company

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Abstract:

To lower maintenance costs and improve a metro company's competitiveness, this research came up with an innovative technique using a considering sensitivity and analytic hierarchy process (CSAHP). Along with interviews with managers and workers at the Taipei Rapid Transit Corporation, this study was able to undertake quantitative analysis. To determine which subsystems and metro lines should be prioritized for outsourcing based on the CSAHP framework, we used the criterium decision plus (CDP) program. This research adds to the existing body of knowledge by advancing the existing analytic hierarchy process (AHP) technique and recommending the CSAHP strategy for assessment. According to the findings, the power supply system was the most in need of outsourcing, followed by air conditioning, firefighting, and elevator systems. When considering which of the four metro lines to outsource first, the blue line came out on top, followed by the red, green, and brown lines. By prioritizing the outsourcing of the power supply system as a result of this research, the Taipei Rapid Transit Corporation may cut the system's maintenance expenditures from USD 1.57 million to USD 1.33 million, saving 15% on maintenance costs. Applying these findings can improve the economic benefits of outsourced maintenance for the Taipei Rapid Transit Corporation.

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