

ABSTRACT

Abstract—This study focuses on optimizing circuit movement within the production line of Yazaki Corporation's subsidiary by implementing a digital Kanban system. Traditional manual Kanban processes at the company suffered from inefficiencies, such as frequent Kanban card losses and extended lead times, which disrupted production targets. A digital Kanban web application was developed to address these issues, incorporating real-time tracking, QR code scanning, and thermal printing to enhance material flow monitoring and control. Performance testing was conducted using request timing metrics and page load testing, with five trials performed for each method. The results were validated using Google Lighthouse, demonstrating the system's ability to improve efficiency by significantly reducing page load times and request processing delays. A comparative analysis of old versus new master data revealed a 48% efficiency gain in Final Assembly and a 66% improvement in Pre-Assembly processing time, leading to an overall reduction of more than 50% in processing time across the production workflow. This improvement contributed to a 42.35% decrease in total production time, significantly enhancing the efficiency of circuit movement processes and enabling faster achievement of production targets. These findings highlight the critical role of the digital Kanban system, mainly its front-end, in optimizing circuit movement and achieving operational excellence within complex production environments.

Keywords—*Digital Kanban, Circuit Movement, Performance Testing, QR Code.*