

# Towards the integrated and effective management of muck waste under the platform governance mode in a circular economy

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## INTRODUCTION

Muck waste is a kind of solid waste that is inevitably produced in the process of urban development and has a dreadful environmental impact due to the inadequate management of public sectors. With the rapid development of Chinese urbanization construction, the amount of construction and demolition waste has been steadily increasing, requiring more integrated and effective management. Exploring how to establish an integrated and effective management system for muck waste in a circular economy is of great importance. The recent trend is using the platform to reform extensive management to delicacy management. Therefore, the purpose of this paper is to experiment with platforms as a strategy of governance and explore how the platform governance mode can contribute to muck waste management in a circular economy.

## METHODS

The methods of this paper involve Petri-net theory and case study.

With the purpose of studying the feasibility of platform governance mode, this paper used Petri-net to compare the traditional governance process and platform governance process of muck waste management. Petri-net is very intuitive and is widely used in computer, mechanical manufacturing, automation and other business process modeling.

In addition, this study used the case study methodology to elaborate third-party platform governance theory. The case study presented in this research focuses on Nanjing's smart muck supervision platform practice and tries to verify the actual effect of the platform governance mode.

## RESULTS

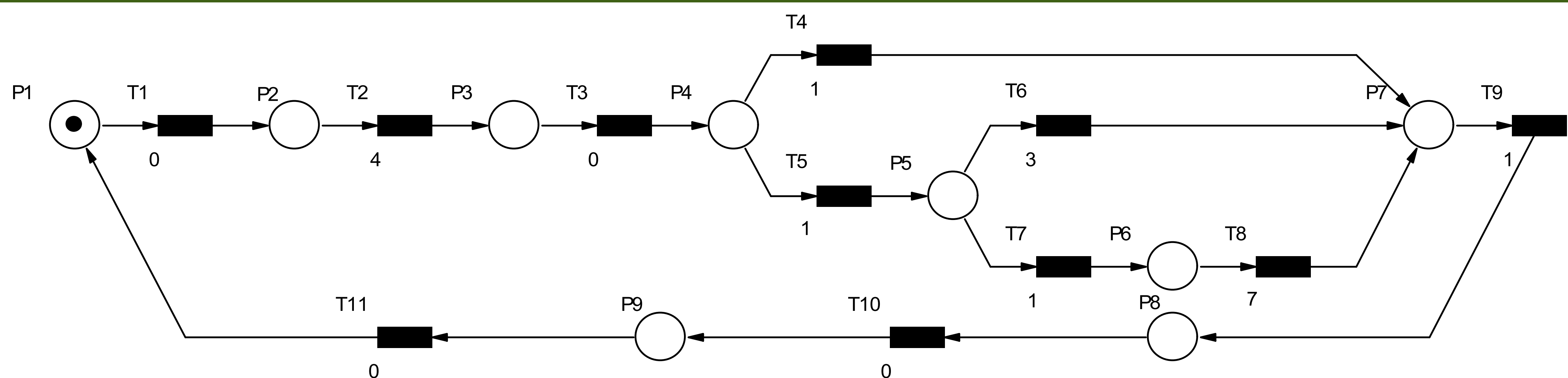


Fig. 1. Petri-net model of muck waste management process under the traditional governance mode

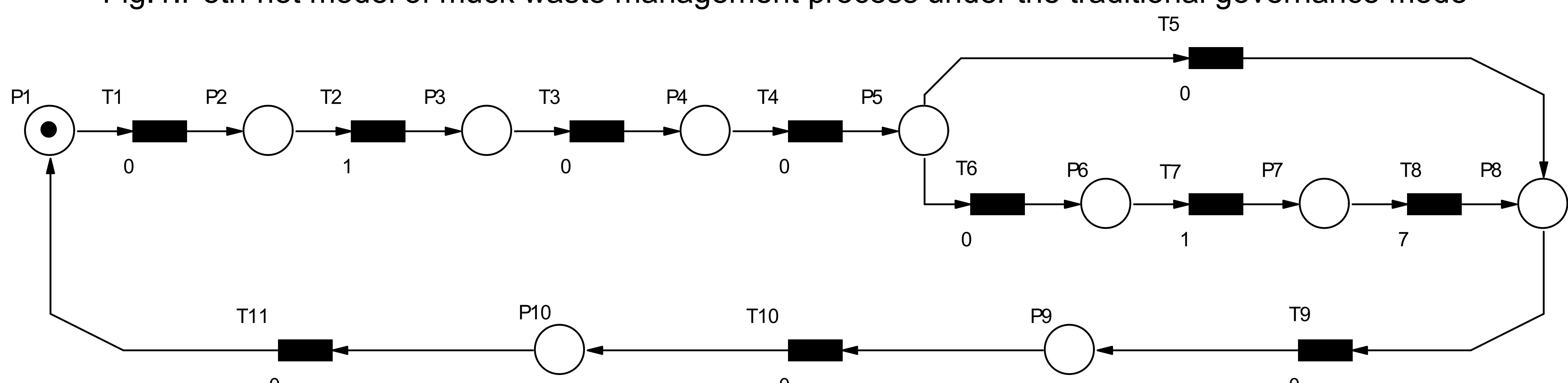


Fig. 2. Petri-net model of muck waste management process under the platform governance mode

Group	Sample Number	Process cycle total time / day	Average process cycle time / day
Traditional Governance Mode	1	10	10
	2	192	9.6
	3	484	9.68
Platform Governance Mode	1	65	6.5
	2	107	5.35
	3	281	5.62

Table 1 Muck waste management process simulation results

By using a Petri-net simulation software to build timed Petri-net models, the simulation results of muck waste management processes are indicated in Table 1. According to the results, the running time of the governance process under the platform governance mode is significantly shorter than that under the traditional governance mode. Therefore, the platform governance mode could be considered very useful for implementing the integrated and effective management of muck waste.

## CONCLUSION

This paper explored the feasibility of providing the platform governance mode for muck waste as an integrated and effective management mode for current practices of muck waste management and resource recovery in China, which is also the main theoretical contribution of this study. After researching the characteristics of the platform governance mode for muck waste management and applying Petri-net theory and a case study to process analysis, we find that platform governance mode can significantly improve the efficiency of the management of muck waste, which will provide economic and environmental benefits. The platform governance mode in a circular economy is a comprehensive solution to the current muck waste accumulation problem and should be encouraged by the government.