A Lean approach to improve productivity and level of service at rail freight industry using big data from Tags and Scanners

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Introduction

- Study In North American railroad shows 59% of transit is spent in terminals.

- the Canadian Pacific Railway (CPR) reported that the average freight car on its system spent 64% of the time in terminals.
Introduction

• Railway operations balancing in the context of freight transportation is an important issue especially in terms of Productivity and level of service to customers.

• Recent approaches have been used for balancing operations in railway transportation-like Using RFID and etc.-are difficult to implement or high in cost.
• We studied about big data and Kanban to develop a novel approach to improve railway productivity

• This method doesn’t need to expensive equipment and facilities

• We survey advantages of digital gadgets as unique MAC address, easy to implement with a low costs
What was our idea?

• Attaching Bluetooth tag on each wagon.

• Installation scanners and infrastructure at each station.

• Developing an app to connect collected data from each station for coordinating operations as a Kanban approach in order to balance all work stages with delivering Kanban information of current to previous station as a chain from Loading to Unloading to create an efficient work cycle.
There were 33.4 hours non-value-added time in the total train cycle time in the current situation.

After implementing the proposed approach, we will be achieved to more than 40% decrease in non-value-added time (19.7 hours).
According to the simulation results, applying these methods:

1. Decrease queue size in the stations especially at loading and unloading stations.

2. Increase level of service to customers by enhancing delivery time of goods.

3. Minimize the number of wagons that is used for transportation of goods.
**Future work**

**IoT Features**

Improve productivity in using wagons and rail infrastructure is very important because a little improvement in using rail facilities lead to save a lot of money. This idea becomes bold because of its features as low cost, easy to implement, and availability of this approach.

**Using Bluetooth tags and scanners**

As we expected, Bluetooth tags data have significant ability to implement a lean transportation for goods.

**Application**

After proving Bluetooth tags data ability to balance logistics of goods. The next step is to provide an application to sent delivery notification to pervious station and also monitoring, controlling and balancing goods logistics process.

**Sync smartphone, tags and operations**

The last stage of presented idea is to sync a smartphone with tags and control room of loading and unloading centers. So easily control and balance of loading, transportation and unloading can be done by a smartphone.
By developing an approach to balance loading, transportation, and unloading. Using this approach will be led to save lots of money and time also decrease delivery time and number of wagon used. Goods data will be easily and fast collected and used to balance and monitor.

The idea of using Bluetooth tags and scanners data to balance rail operations makes a great changes in rail freight industry toward its lower costs and efficiency.