Proposal Topic for a Master thesis:

“In-plant Milk Run Systems in Industry”

Background:
In material flow system, parts are supplied to the workstations from the warehouse or from several supermarkets. The supplying process can be accomplished using tugger trains or forklifts. The tugger trains provide the chance to supply several workstations in one trip of the train. This is called “in-plant milk run” which will decrease the transportation costs. This is different from the usual milk run applied outside the company and concentrating on the movement of trucks among several companies. The demand for parts by workstations is sometimes dynamic. Sometimes the capacity of tugger trains is not enough to satisfy the demand. Sometimes the capacity is more than enough according to the demand pattern. The parts should be transported just in time. Many methods have been proposed in the literature to plan the feeding process.

Objective: to investigate how the milk run systems are managed in the industrial field

Methodology: questionnaire design and analysis

Research tasks:

1. Prepare a list of companies which are using the tugger trains or push manual carts
2. Design the questionnaire. It must contain at least the following:
   a. Which production environment the companies use (job shop, assembly lines, etc.)?
   b. Which industrial field does each company belong to?
   c. How do the companies manage the in-plant milk run system, especially the routing, scheduling, and loading problems?
   d. Do the companies use the demand-oriented or kanban system? And how are both of them managed? If kanban is used, how is the number of kanbans determined?
   e. Do the companies use the main warehouse or use also the decentralized supermarket system?
   f. Which types of troubles and challenges happen in the companies and in which frequency? These troubles and challenges may be:
      i. Variable train capacity
      ii. Dynamic demand
      iii. Errors in delivery
   How do the companies accommodate such problems?
3. Contact with companies and send the questionnaires.
4. Receive the questionnaire copies and statistically analyze them
5. Determine which the main conclusion and lessons are
Student profile:

The student must be familiar with statistical analysis principles and software for statistical analysis such as SPSS or Minitab. The thesis can be written in English or German. According to the available times, sometimes the meeting of the supervisor and student may take place in the weekend.

To have more information about the topic please see at least one film in YouTube by entering the word “tugger train” or “routenzug” in the search engine. Moreover, please read the following paper:


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