Analysis of the impact of temporarily hired workforce on productivity performance of a manufacturing company: evidence from the Hungarian confectionery factory

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Abstract

Key objective of the project - identify and analyze the most influential from production efficiency point of view factors, especially evaluate the impact along with significance of the leased staff on the productivity performance of the factory controlling on other potentially powerful variables.

Surprisingly the data mining and the following regression modeling doesn't demonstrate clear evidence of an adverse effect exerted by a temporary staff on performance metrics, commonly attributed by company management considering absence of commitment, low-skilled type of tasks they can execute and overall irresponsible attitude to a temporary employer.

Worth to mention that still leased staff is engaged more in physically intensive type of works such as loading, packing or labeling were experience gives no competitive advantage.

As a direction for further investigation I would propose to explore more deep social networking effect inside a team – for example analyzing correlation between the workers constantly working together we identified 8 workers having strong relationships within the group and being assigned most of the time to the same production line executing same technological operation all year round.

Remarkably but their relative efficiency (actual output) for the shifts they participated in was on average lower for 6 persons out of 8 than the factory`s average. Here might be two possible explanations – first one that monotonous nature of work suppresses further personal development and the second can be the case of social loafing phenomenon

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1. Introduction

Partly due to local historical cultural context, Christmas candies ([szaloncukor] https://en.wikipedia.org/wiki/Szaloncukor) are treated not only as a edible sweets but also play a role as a Christmas tree decoration elements (Hungarikum tradition). All local confectionery producers suffer from precipitous fluctuations of production capacities for a short period of time starting from a seaaonal drop during the summer and following by steep increase in September before pre-Christmas season.

The only reasonable outcome (technologically it is unacceptable to produce most types of Christmas candies in advance) for the problem - to hire temporarily low skilled workers to close the gap of staff available and required. Apparently this cause the problem for the manufacturing efficiency - during the period of learning and adaptation of newcomers (should be mentioned the problem of the high attrition rate at the moment) those lines exposed to the deployed leased staff underperform with -15% on average than before. Somehow this indicator gradually recovers during this time span of overloaded capacity but doesn't attain to the normally accepted level.

Mainly because of the lack of knowledge and skills needed to make a research analysis there were no attempts in the past to define real reasons and their impact on the decline of the productivity (focus of production planning team primarily was set on minimizing leased headcount per se neglecting appearance of sensitive side-effects).

2. Data

Production accounting is carried out in ABAS ERP system, there are several executives in production area responsible for reliable and precise data recording. The principle of duty segregation obviously having positive intention to mitigate fraud risk at the same time cause a lot of problem for data quality and inconsistency.

As a consequence of improper data flows management the first problem which was revealed – that timesheets are filled by time sheets administrator based on daily Excel reports received from shift leaders of 3 shifts for the previous day. So it is common situation that for some shifts within a day data and timing would be messed up distorting real picture.

Initial plan to use 5 years span of data records from 2013 till 2017 for analysis was shortened later to 4 freshest years and during data manipulation was shrank further to Mar-2015 – Dec-2018. Till 1st of March of 2015 production order opened for some volume, not period no matter how many shifts or day it will last. So common situation was that order was postponed and ended in a week after after initialization making impossible to correctly parse data inside day or exact shift

3. Assumptions

4. Model

5. Generalization and implementation

6. Conclusions

7. Appendix

PHASE 1.1:
Technology used:
Ernst
Operation used:
Fondan főzés

Fondant cream cooking

Choc. mass cooking

PHASE 1.2:
Technology used:
Reimelt+Thouett
Operation used:
Csokoládé massza osztott gyártás

PHASE 2:
Technology used:
Cavemill-275
Operation used:
12,1g desszert formázás 9 fővel 21 ütem

Pralines moulding

PHASE 3:
Technology used:
FIMA
Operation used:
12,1g desszert formázás 9 fővel 21 ütem

Wrapping in individual foil

PHASE 4:
Technology used:
Nagy Shubert
Operation used:
Csomagolás desszert szív kmeggy 10db gépi

Packing in box

Figure #. Technological process of Cherry Queen 125 gr production

8. References