9th International Conference of the
TOC Practitioners Alliance - TOCPA
www.tocpractice.com
Nov 1-2, 2013 Utrecht, The Netherlands

Buffer management as a universal logistics tool:

Reducing transport costs in the agricultural holding by applying TOC

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1 November, 2013

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Project case-study and conclusions

Agricultural holding, Ukraine

Scale	• "storming the hill" of USD 1 bln
Business objective	• to increase the core business turnover 2.2 times in a year (1)
Project objective	• to optimize key business processes through using TOC, lean, IT, BSC, KPI, incentive...

Project case-study and conclusions

- ✓ There was no direct request from the client to implement TOC
- ✓ TOC was used both locally and globally in conjunction with other tools
- ✓ In particular, to optimize the transport logistics...
- ✓ This project has expanded my understanding of TOC application
- ✓ In this presentation I'd like to share my observations, thoughts, and findings…

Case-study #1.
How many transport units are needed?

The business situation itself and the project to address it were connected to 'elevating the constraint':

Construction of additional processing plant nearly completed.
It will increase the production capacity 2,5 times

New constraint of the system: purchase

Production +150%...

Potential constraint of the system: logistics

Case 1
How many transport units are needed?

- ✓ At the moment 80% of the demand is covered by company's own trucks
- ✓ Output will be doubled
- ✓ The same number of tanks should be purchased
- ✓ The cost is about $ 200 thousand per unit

Production +150%...

Potential constraint of the system: logistics

Case 1
How many transport units are needed?

How effectively are the trucks used now?

UDE: queue in loading

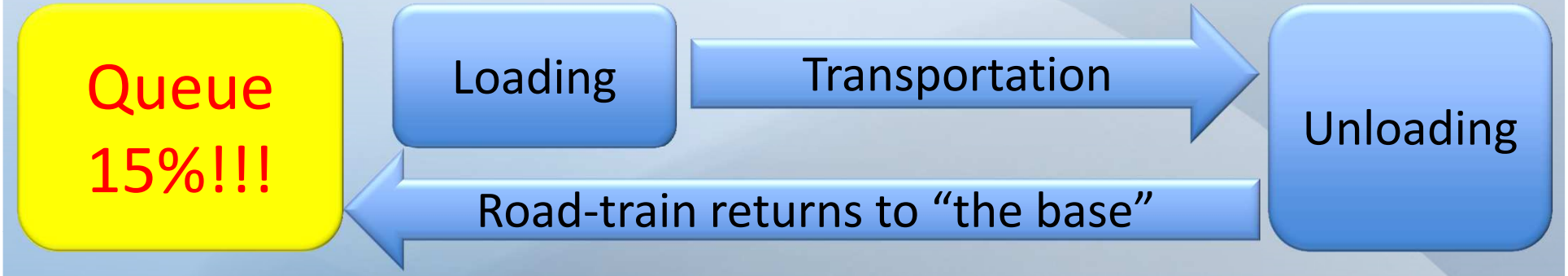
The calculation showed that the queue time accounts for ***15% of time*** *of the cycle time of the raod-train usage*

The “price” in question is **several millions EUR**

Production
+150%...

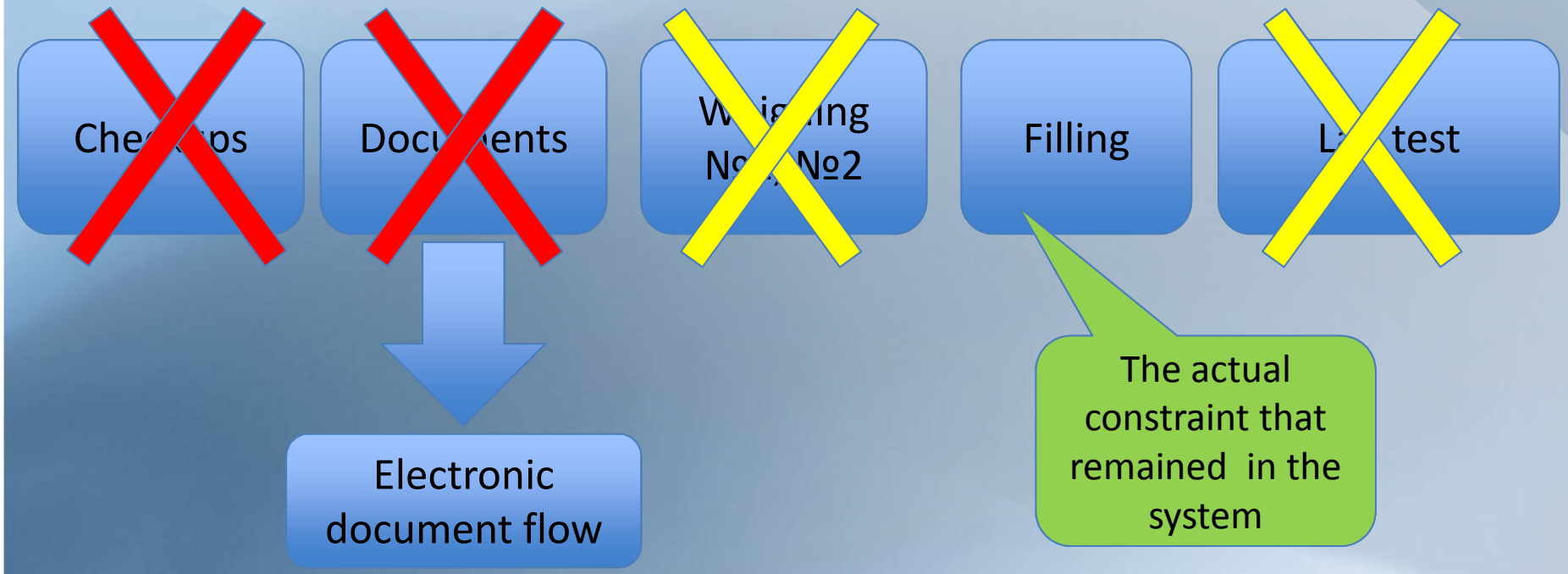
Potential constraint of the system: logistics

Case 1
How many transport units are needed?



Causes for the queue

- Planning
- Constraints in the system
- Balanced capacity concept



Case 2
Queue at receiving supply

- Do you have a queue at receiving supply?

- In high season - YES!!!

- How do you measure it?

- In kilometers!!!

- What do you do to reduce it?

- Nothing.

- WHY??????????????????!!!!!!!!!!!!!!

- We don't pay the carrier for waiting time!!!

There's something wrong here!- the intuition prompted ☺

What did the intuition imply?

We don't pay for waiting time…

?????

But there are losses in the system…

During season when there are not enough transport, trucks are waiting in the queue…

Carriers suffer losses (or lose some profit…)

Are we sure WE don't suffer losses???

Carriers include their potential losses in the transportation RATES!!!!

My recommendations

Learn to manage the queue and significantly reduce it

??????????????? ??????????? ???????? ????????????

To conduct negotiations / hold tenders for transportation and reduce the rate

My recommendations

Learn to manage the queue and significantly reduce it

Include in the contracts penalty for waiting time !!!!!

To conduct negotiations / hold tenders for transportation and reduce the rate

The company's management thought the idea was too radical, but agreed with the overall logic …

Learning to manage the queue

In contrast to case 1, WE NEED THIS QUEUE

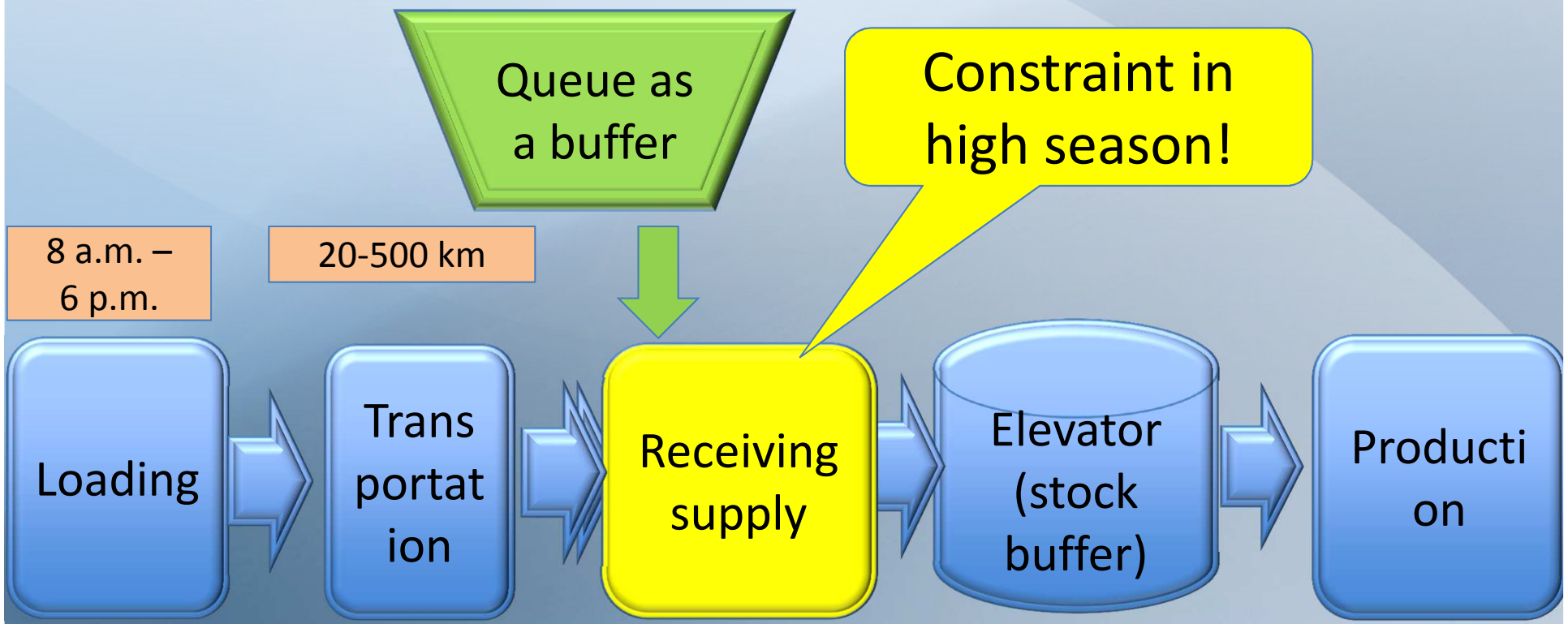
There are no trucks in the morning, the queue is starting to build up at 2-3 p.m.

8 a.m. – 6 p.m.

20-500 km

Learning to manage the queue

In contrast to case 1, WE NEED THIS QUEUE



Learning to manage the queue

- **Queue as a buffer in front of the constraint**
  - ✓ But the queue is “expensive”
    - ✓ Therefore the queue has to be managed
- **Two algorithms were created:**
  - «precise»
  - «primitive»

Primitive:
while ordering trucks – take into account the capacity of receiving supply, and adjust this amount (in trucks) according to the length of the excess queue

Conclusions

Conclusion #1

Dynamic Buffer Management is a universal mechanism to solve logistical (and other) objectives.

The buffer can be of different nature:

- Stock buffer
- Time buffer
- Trucks buffer
- Buffer of ideas
- Buffer of projects
- Buffer of molecules
- ……

Conclusions

Conclusion #2

If there are loss esin the system,
you need to reduce them.

Regardless WHOSE loss it is: "ours" or "not ours“. This improves the effiectiveness of the whole system.

How to obtain benefits of these improvements is a question of great importance, and it can be solved through:

- Sharing the benefit among the parties
- Developing Mafia Offer
- Creating a new business
- …

Thank you for your attention!

Ready to answer
your questions ☺