



[www.tocpractice.com](http://www.tocpractice.com)

**2<sup>nd</sup> International TOCPA Conference,  
19-20 May 2012, Moscow**

Experience in using automated  
accounting system in TOC  
implementations  
in Make-To-Order environment  
NetMarket.TOC  
Vladimir Ozherelyev



# Vladimir Ozherelyev

General Director of an IT company.

Experience:

Head of marketing department,  
It consultant.

The company is working in the areas of:

- IT-consulting and support of multi-level marketing companies
- Direct Marketing and personalization
- Developing and implementing software packages to support TOC implementations





# Implementation 1

## Development background:

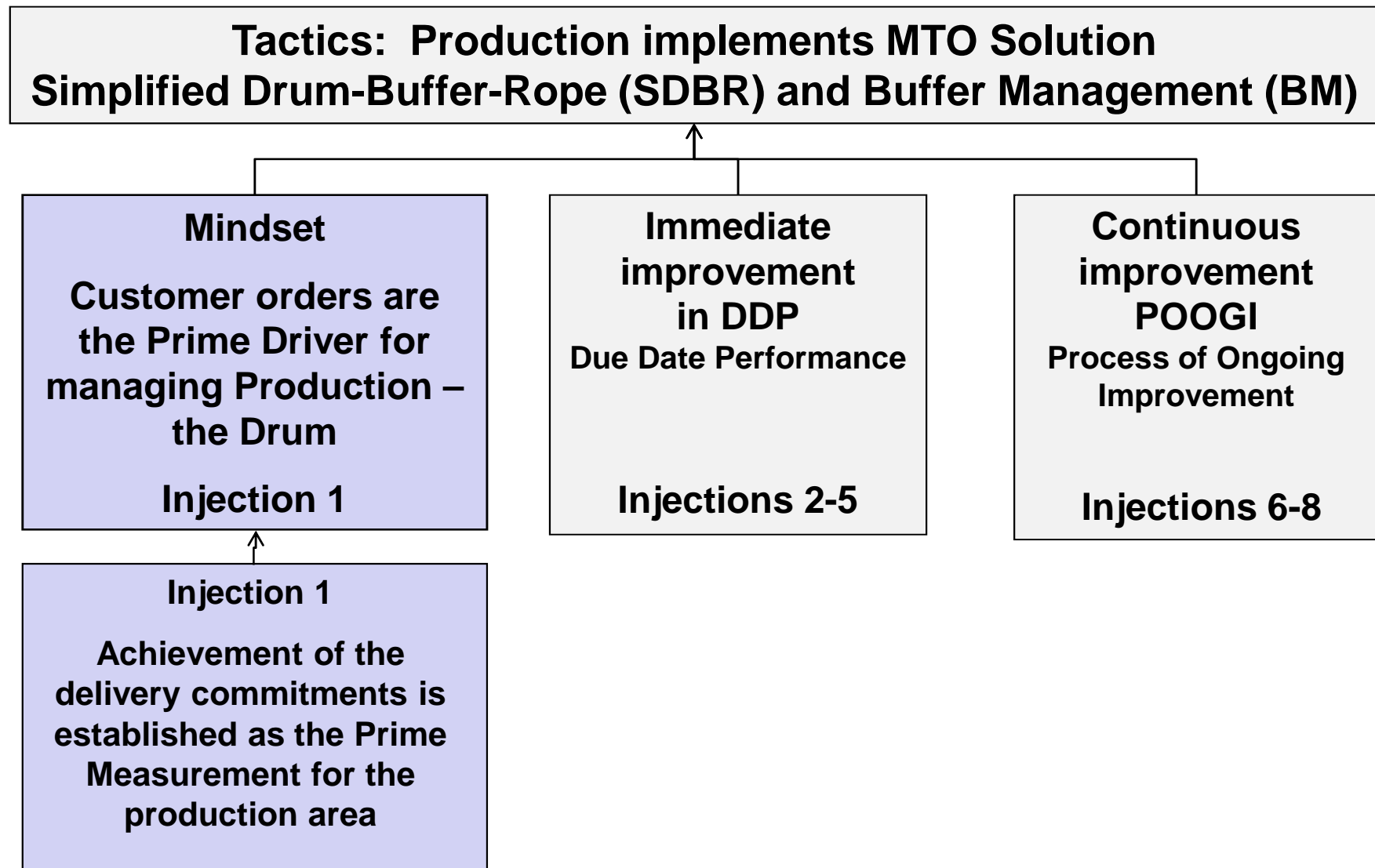
Company: “LBL Polygraph-service” printing house.

In the process of TOC methodologies implementation for the management of make-to-order production, the team faced a number of challenges preventing the successful completion of the implementation process:

- Lack of uniform order tracking system. Managers are not able to see the current status of the order and call to the executors to influence priority of orders processing;
- Resistance to change by the executors (unwillingness to follow new instructions, and sometimes they are forced to behave like that (according to the conventional scheme) during the periods, when there are a lot of rush orders or orders from VIP customers);
- Some sites kept practicing prioritizing the orders that the executor liked before an urgent order (design department, print);
- Lack of the overall picture of the production capacity utilization, heavy workload of the dispatcher due to the introduction of color coding. Often the dispatcher did not change the order status on the dashboard;



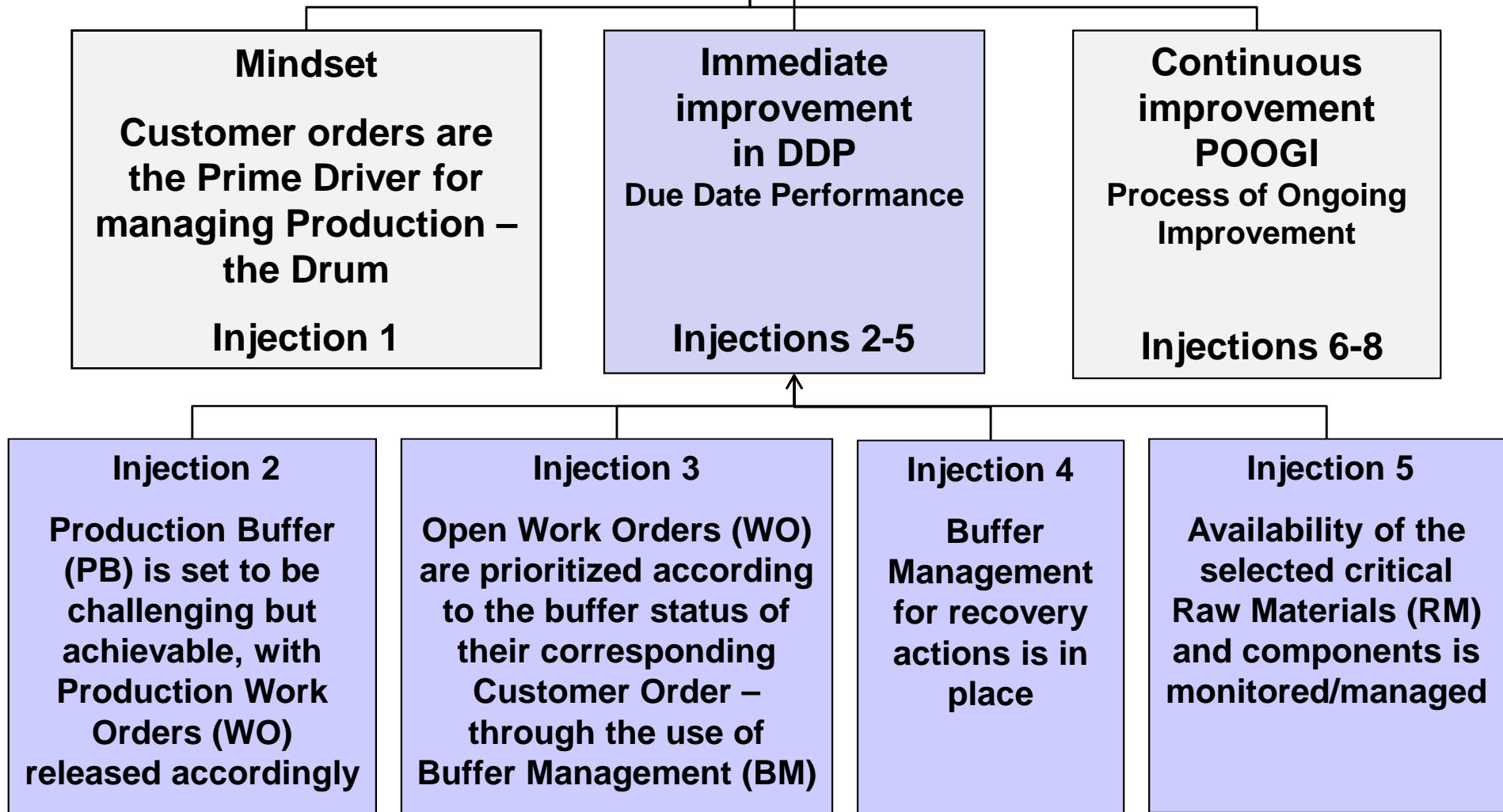
# TOC Solution for MTO





# TOC Solution for MTO

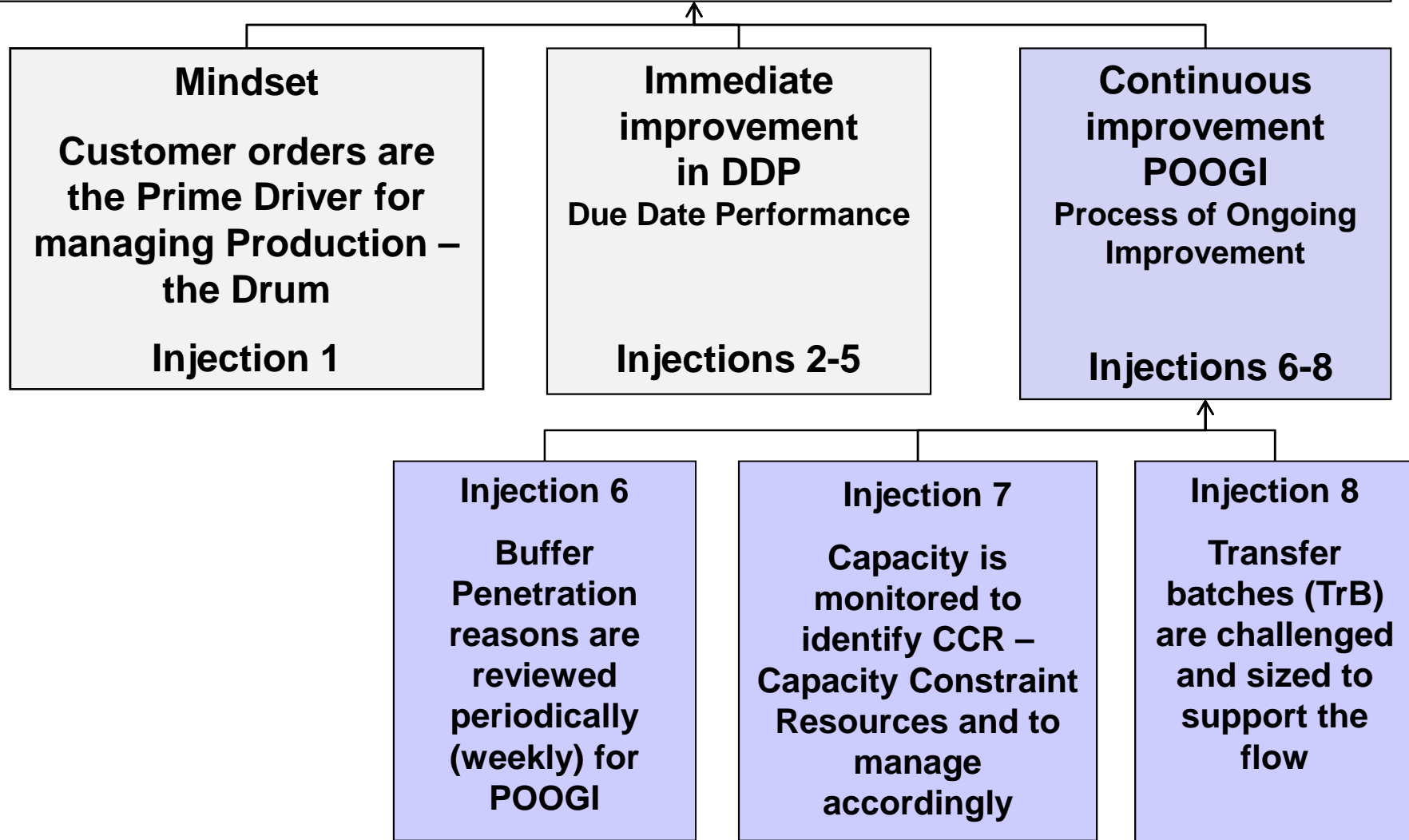
**Tactics: Production implements MTO Solution  
Simplified Drum-Buffer-Rope (SDBR) and Buffer Management (BM)**





# TOC Solution for MTO

**Tactics: Production implements MTO Solution  
Simplified Drum-Buffer-Rope (SDBR) and Buffer Management (BM)**





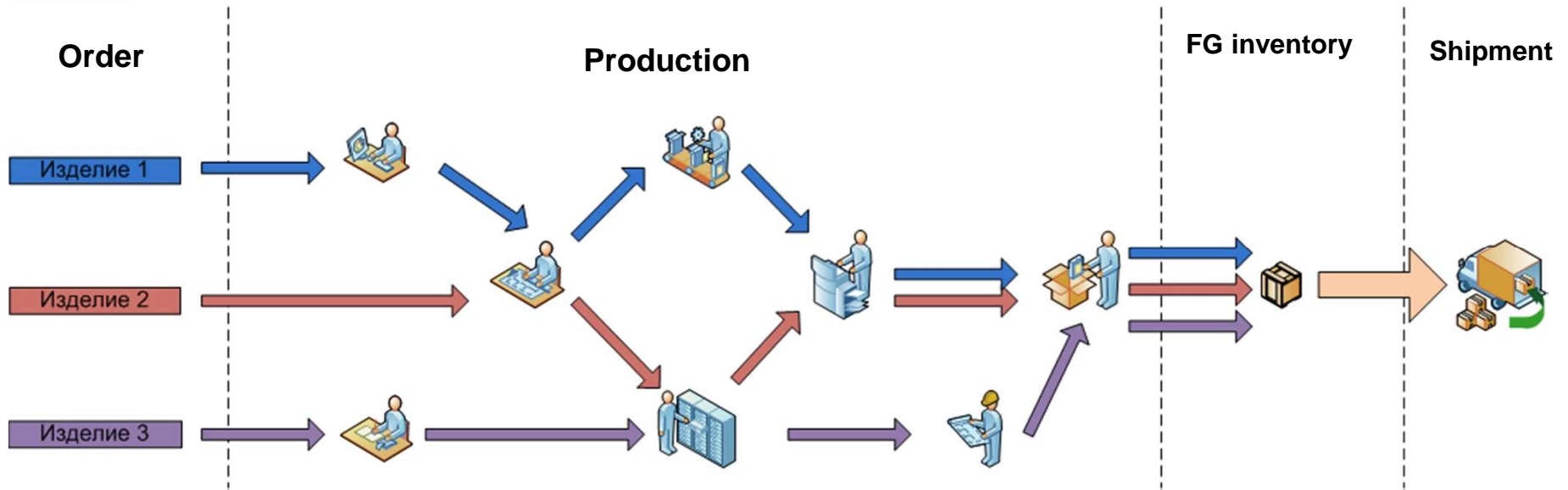
[www.tocpractice.com](http://www.tocpractice.com)

**2<sup>nd</sup> International TOCPA Conference,  
19-20 May 2012, Moscow**

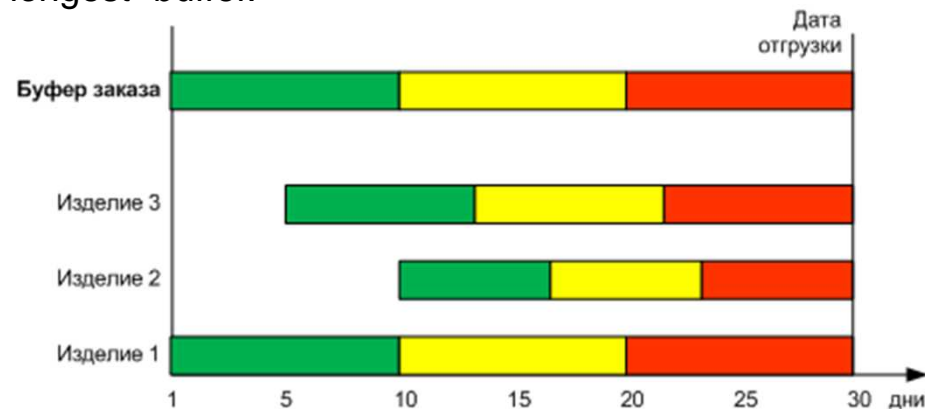
To ensure fulfillment of Injections 2-4 on the production sites, an appropriate automated system was developed, through which the executors released the work into production.

Further program details

Presentation of order execution process in the automated system (AS)



According to the Injection 2, the buffer size should be set for each item (aggressive, but achievable). The time of raw materials release is set for each product in relation to the date of shipment and according to the size of the buffer. The sequence of the goods release into production is set in accordance with their status (Injection 3), thus the buffer management mechanism is assured to work. The whole order is color-coded according to the "longest" buffer.





1.

Общие данные | Изделия и этапы изготовления | Дата отгрузки | Параметры заказа и оплаты

№ п/п	Наименование изделия	Колево	Стоимость, руб.	Ст-ть раск. мат.-ов (руб.)	Оценочная дата изготовления
1	Листовка, Инструкции, Памятка	100	567	34	10.12.2009

Вид изделия: [Не привязан к виду] | Наименование изделия: [ ] | Добавить

Количество: [0] | Стоимость, руб.: [0] | Ст-ть раск. мат.-ов (руб.): [0] | Изменить | Удалить

Список этапов изготовления изделия: Листовка, Инструкции, Памятка

№ п/п	Наименование буфера	Операция	Участок/ресурс
1	Препресс	Согласование заказа	Коммерческая служба
2	Препресс	Верстка	Отдел верстки и дизайна
3	Препресс	Расчетка	Репроцентр ТУТ
4	Препресс	Подготовка к пров.	Тех. отдел
5	Междубуферный отрезок	Передан тиража в производство	Передан тиража в производство
6	Производство	Подготовка отрезков	СТР
7	Производство	Печать	R700
8	Междубуферный отрезок	Закупка расходных материалов	Закупка расходных материалов
9	Производство	Печать	Копира
10	Производство	Печать	R200

1

2.

Наименование буфера	Операция	Участок/ресурс	Ед. изм.		
> Этап	Препресс	Препресс	Буфер препр	0	2
Препресс	Согласование заказа	Ком-мерческая служба	дм		
Препресс	Верстка	Отдел верстки и дизайна			
Препресс	Расчетка	Репроцентр ТУТ			
Препресс	Подготовка к пров.	Тех. отдел			
Препресс	Прокладка файла	Отдел верстки и дизайна			
Препресс	Цветопроба	Репроцентр ТУТ			
Препресс	Расчетка	Репроцентр ТУТ			
Препресс	Изготовление макета	Репроцентр ТУТ			
Препресс	Разработка конструкции КБ				
Препресс	Подготовка к пров.	Тех. отдел			
> Этап	Междубуферный отрезок	Междубуферный отрезок		1	3
Междубуферный отрезок	Передан тиража в пров.	Передан тиража в пров.			
Междубуферный отрезок	Закупка расходных мате	Закупка расходных мате			
Междубуферный отрезок	Закупка бумаги	Закупка расходных мате			
> Этап	Производство	Производство	листопрогон	3000	10000
Производство	Подготовка работ	Подготовка работ			
Производство	Подготовка спусков	СТР			
Производство	Цифровая печать	Репроцентр			
Производство	Печать	R700	лист		
Производство	Печать	Копира	лист/лос		
Производство	Печать	КВА	лист		
Производство	Печать	R200	лист		
Производство	Фальцовка	Фальцовка	лист		
Производство	ВВРА	ВВРА	шт.		
Производство	КЭС	КЭС	шт.		
Производство	УФ-лак	УФ-лак	лист		
Производство	Трафарет	Трафарет	лист		
Производство	Ламинация	Ламинация	лист		
Производство	Тиснение	Тиснение	лист		
Производство	Конгрев	Конгрев	лист		
Производство	Варьбл	BOBST	лист		
Производство	Варьбл	Тигель А1	лист		
Производство	Варьбл	Тигель А2	лист		

2

3.

Общие данные | Изделия и этапы изготовления | Дата отгрузки | Параметры заказа и оплаты

Одна отгрузка: [ ] | Оценочная дата отгрузки: 10.12.2009

Дата плановой отгрузки: 04.12.2009

№ п/п	Наименование буфера	Дата буфера		Размер буфера		Расчетный % проинформации в буфер на входе	Текущий % проинформации в буфер
		начало	конец	количество дней	количество рабочих дней		
1	Препресс	30.11.2009г.	01.12.2009г.	4	2	2	50
2	Междубуферный отрезок	02.12.2009г.	02.12.2009г.	1	1	1	0
3	Производство	04.12.2009г.	03.12.2009г.	3	1	1	67

3

4

### 3 basic steps of order placement :

1. Entry of the list of the order items identifying quantity, price and cost of consumables.
2. The route of production should be set for each product, indicating the work content of each operation in accordance with accepted levels of complexity of the product. The five levels of order complexity for each work station is set in the program.
3. The program automatically estimates the due date of the order choosing the immediate buffer that is designed for each step, taking into account the labor intensity of production of each item and its availability during the day and week. According to Injection 2, the program provides three buffer sizes for each step.
4. The manager can change the date of the planned shipment, however, the level of the initial penetration into the buffer of the order is automatically determined by the reduction of the production period. Thus, according to Injection 3, the manager can control the speed of the order production at the stage of the order entry.

Management of order production. Dispatcher.

Список производственных заказов

Фильтр: <Все> В работе  
Этап: <Все>  
Менеджер: <Все> Все завершенные с 29.11.2009 по 29.11.2009

№ п/п	№ заказа	Наименование заказа	Наименование изделия	Кол-во, шт.	Текущий % принята в буфер	Состояние	Участок	Буфер	Дата буфера			
									начало	окончание	вход	выход
1	54466	АЗРОПРИБОР-ВОСХОД	Брошюра	10000	5 400	Ожидает	Тех. отдел	Препресс	10.авг	11.авг	25.ноя	
2	3515	Акварель	Открытка, Приглашение	200	100	В работе	Репроцентр ТУТ	Препресс	25.ноя	25.ноя	25.ноя	
3	32554	Авиолон	Визитки, Карточка, Бейдж	2000	50	Ожидает	КБ	Препресс	25.ноя	27.ноя		
5	543	Высота	Листовка, Инструкция, Штандарт	100	25	В работе	Коммерческая служба	Препресс	30.ноя	03.дек		
6	2233	Фотопроект	Палка	2000	9	Ожидает	СТР	Производство	25.ноя	09.дек		
7	56565	Город	Постер, Плакат, Афиша	2000	0	В работе	Отдел верстки и дизайна	Препресс	30.ноя	01.дек	29.ноя	
8	7777	Газавтоматика	Листовка, Инструкция,	2000	-100	Ожидает	Коммерческая служба	Препресс	09.авг	07.дек	01.май	

Детальный вид заказа (№ 2):

№ п/п	Цех	Оборудование	Дата начала	Дата окончания
1	Согласование	Коммерческая служба	25.11 (02:25.11 (04:55))	25.11 (04:25.11 (04:55))
2	Верстка	Отдел верстки и дизайна	25.11 (04:25.11 (04:55))	25.11 (04:25.11 (04:55))
3	Цветопроба	Репроцентр ТУТ	25.11 (04:25.11 (04:55))	25.11 (04:25.11 (04:55))
4	Изготовление макета	Репроцентр ТУТ	25.11 (04:25.11 (04:55))	25.11 (04:25.11 (04:55))
5	Подготовка к прокату	Тех. отдел		
6	Передача тиража	Передача тиража		
7	Цифровая печать	Репроцентр		
8	Печать	КВА		
9	Печать	R200		
10	Ручные работы	Ручные работы К2		

Dispatcher monitors the production of all items in the production by frame "The list of production orders":

1. The filter box for the list of production orders (items).
2. List of items that are in the production process. The size of the buffer penetration, current state and current work station of the route should be indicated for each item .
3. The route of production. This list demonstrates what stages of processing the item has already passed, in what work station the item is now and what work stations are pending.
4. Indication of the start / suspension / completion of the item processing in the selected area of production. Dispatcher has the right to record the fact of launching the item at a particular work station and the fact of completion of processing of the item at the work station.

Сетевой маркетинг - [Рабочее место Администратора]

Файл Справочники Операции Отчеты ?

Список участков исполнения заказов

Участки исполнения | Диаграмма загрузки

Фильтр:  Все  Очереди > 0  Только ограничения  Только очередь на текущий ресурс

№ п/п	Цех	Оборудование	Колво заказов в очереди		№ п/п	№ заказа	Наименование		Буфер, %	Состояние	Участок	Дата начала
			всего	этот этап			заказчика	изделия				
1	Препресс	Препресс	0	0	1	3515	Акварель	Открытка, Приглашение, Прог	100	В работе	Репроцентр ТУТ	25.11 (04:3
2	Согласование заказа	Конвертерская служба	2	2	2	7777	ОАО "Газвотонатика"	Листовка, Инструкция, Панятка	0	Ожидает	Репроцентр ТУТ	
3	Дизайн	Отдел верстки и дизайна	0	0	3	32554	Авилон	Визитки, Карточка, Бейдж	0	Ожидает	Репроцентр ТУТ	
4	Верстка	Отдел верстки и дизайна	2	1								
5	Проверка файла	Отдел верстки и дизайна	1	0								
6	Цветочная	Репроцентр ТУТ	0	0								
7	Распечатка	Репроцентр ТУТ	1	0								
8	Изготовление макета	Репроцентр ТУТ	3	2								
9	Разработка конструкции	КБ	2	1								
10	Подготовка к проиов.	Тех. отдел	7	2								
11	Межбуферный отрезок	Межбуферный отрезок	0	0								
12	Передача тиража в производств	Передача тиража в производств	7	1								
13	Закупка расходных материалов	Закупка расходных материалов	5	1								
14	Закупка бумаги	Закупка расходных материалов	0	0								
15	Производство	Производство	0	0								
16	Подшивные работы	Подшивные работы	1	0								
17	Подготовка слухов	СТР	3	2								
18	Цифровая печать	Репроцентр	1	0								
19	Печать	R700	3	0								
20	Печать	Конюки	3	0								
21	Печать	КВА	3	0								
22	Печать	R200	5	0								
23	Резка	Резка	2	0								
24	Фальцовка	Фальцовка	5	0								
25	ВШРА	ВШРА	2	0								
26	КБС	КБС	0	0								
27	УФ-лак	УФ-лак	1	0								
28	Трафарет	Трафарет	1	0								
29	Ламинация	Ламинация	1	0								
30	Тиснение	Тиснение	0	0								
31	Конгрев	Конгрев	0	0								
32	Вырубка	BCBST	1	0								
33	Вырубка	Тигель А1	1	0								
34	Вырубка	Тигель А2	1	0								
41												

Запустить Завершить Отменить Приостановить

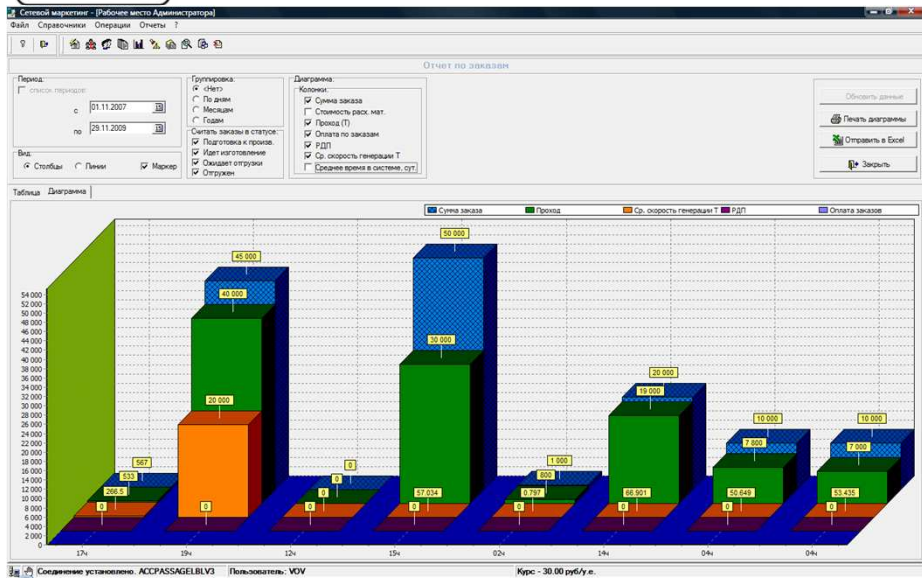
Соединение установлено. ACCPASSAGELBLV3 Пользователь: VOV Курс: 30.00 руб/у.е.

The executor controls the release sequence for the production of items by frame "List of work stations to process the orders" at the production station:

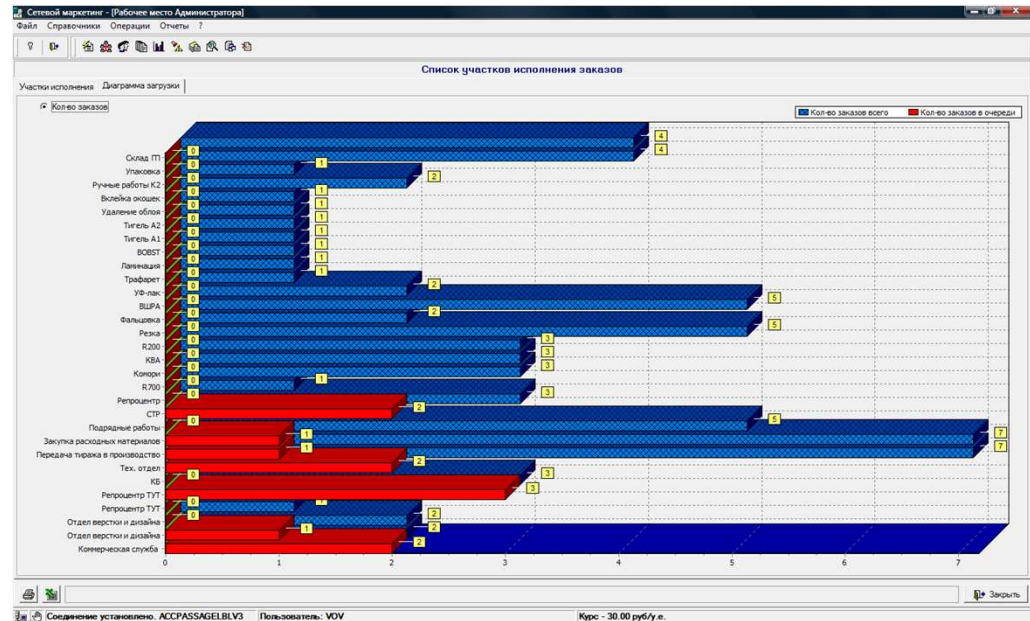
1. Filter box for the list of work stations (resources).
2. List of work stations (for the particular executor is "visible" only his/her work station, for administrator – all work station). For each work station the number of production batches (items) is indicated in the queue just before the work station and the number of items in a system that are pending to "go" through this work station.
3. List of production batches in the queue to the resource.
4. Start / completion management. Executor records the fact of starting and completion of item processing on the work station.



1. Report on orders



2. Report on current load of the work stations





# Overcoming resistance to implementation of the AS

1. In order to motivate the managers to enter the orders into the system a rule was established to accrue bonuses only on the orders that the were entered into the program;
2. To verify the order execution sequencing on the work stations an administrative group comprised of the top managers of the company was organized. There was a penalty established for the execution of an order out-of-sequence;
3. Computers were installed in the production for each foreman. Dispatcher no longer managed the queue, his/her main role is now: to ensure the availability of consumables on the workstations by the time of the beginning of the order processing;
4. Keeping management accounting for a number of legal entities in one program. Connection of the warehouse of consumables and finished goods.



# Outcome

- The order processing sequence at a work station is to be executed only in accordance with the color coding of orders in the program. To produce an urgent order, it is enough to specify the color code upon the entry into the system.
- The system displays standard due dates of orders production that were entered during the implementation of TOC and accepted by managers (the standard buffer sizes that were set for each step). Previously, the managers overstated these dates because they perceived them as their personal responsibility;
- Reduced the number of contacts between the managers and executors of their orders to the required minimum: no influence and pushing.
- Management and interested persons can always have necessary information for the decision-making. For example, accept / reject a rush order. For this purpose, the program displays a general list of orders with the data on the penetration into the buffer. Capacity utilization of each workstation: actual and planned. Report of the manager with size measure of the РДП (consolidated information on the amount of overdue orders in the system).
- Statistics gathering. The bottlenecks for different order profiles were identified more accurately.
- The price list was updated as the data on an average throughput per unit of goods by each order profile, and real touch time for these orders in the system.



# Implementation 2

Enterprise: Steel Fabrication Plant.

Outcome TOC methods implementation in an make-to-order environment:

- The bottleneck (the press) was exploited. A system of orders color coding was introduced.
- As a result, the speed of processing and production of orders increased by several times. Customers could hardly manage to take their finished products away. We faced another problem: storage of finished products.
- After TOC methods implementation, the accounting system was run in MS Excel. The whole information was fed to the dispatcher, who entered the data on the current status of orders into a file, and monitored the release of the orders into orders on the basis of the entered information



### Background of AS introduction:

- Lots of contacts (phone calls) between the dispatcher and the production sites (some sites were in different buildings);
- Lack of real time information update;
- Lack of production orders history, which greatly hampered tackling the causes of penetration into the buffer (Injection 6 );
- Complicated process of statistics gathering and analysis. For this reason, it was difficult to monitor production capacities utilization (Injection 7);
- An accounting software for the warehouse of finished goods was urgently needed with reference to the order and the possibility of partial shipments.

### The following results were achieved after the implementation of AS :

- The system displayed information on the current order status;
- Statistics accumulation;
- Early preparation of documents for shipment at the accounting department;
- Accounting of partial shipments of the finished products.





# Implementation 3

Enterprise: Production of promotional products.

Introduction of the AS was performed simultaneously with the implementation of TOC.

The main UDEs before the implementation of TOC :

- Order pushing by managers;
- Continuous peak in production, worked often in three shifts;
- Lack of management accounting encompassing a number of legal entities.

Outcome of TOC implementation:

- Injections 1-8 were introduced for production management in make-to-order environment according to TOC;
- The guidelines were developed for the functions;
- Procurement of materials was optimized (a new position was introduced );
- Implementation was conducted from 01.2011 to 06.2011



## TOC implementation result at the end of the year:

In 2011, the Company increased its turnover by 1.5 times compared to 2010.

The words of the CEO of the Company demonstrate best the achieved results of TOC implementation:

### *Summary of TOC implementation:*

*TOC alone did not bring more orders, but the interaction among the departments improved. It has become visible what is happening to the order now and what is the status of the order, which allows processing orders quicker. The number of internal conflicts (made an emphasis on it) reduced. The software helped reveal that the company earned not on the products we previously thought, but on a very different range of products, most of which are produced by a subcontractor. As a result, currently the subcontractor operations department is being strengthened. We found a constraint – the design department. Currently, we are reorganizing the department: two areas to allocate: design and standard preparation of the models. In general, we are pleased with the outcomes of the work.*