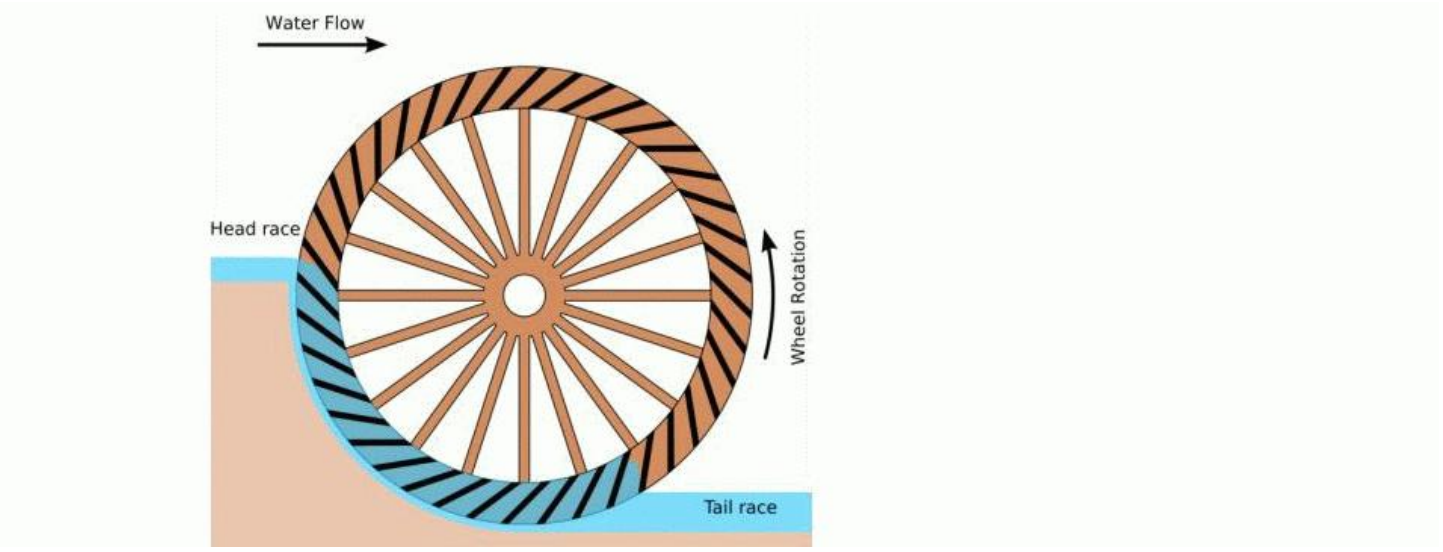

Holding Cost of Effective Flow (part 2)

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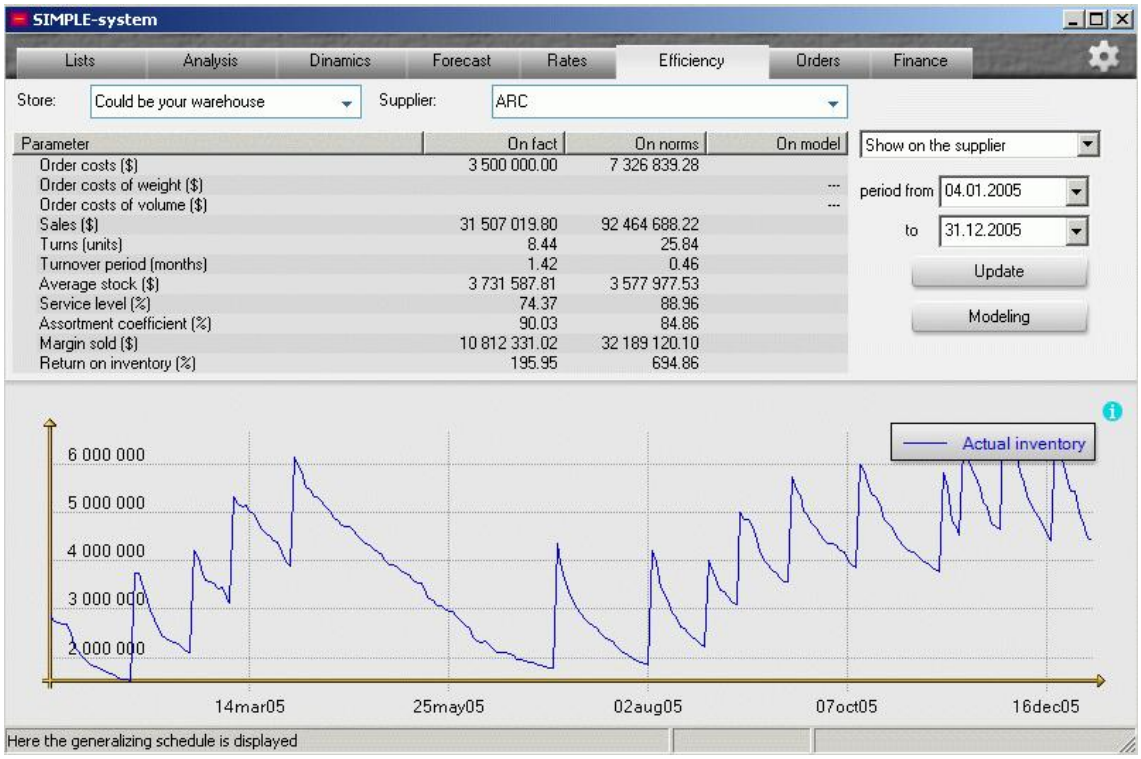
Let us consider the results of misuse of the correct holding costs values. To check it we employ the simulation model of SIMPLE-system. We see the actual inventory dynamics (stock (in money units – say dollars) for each the day).

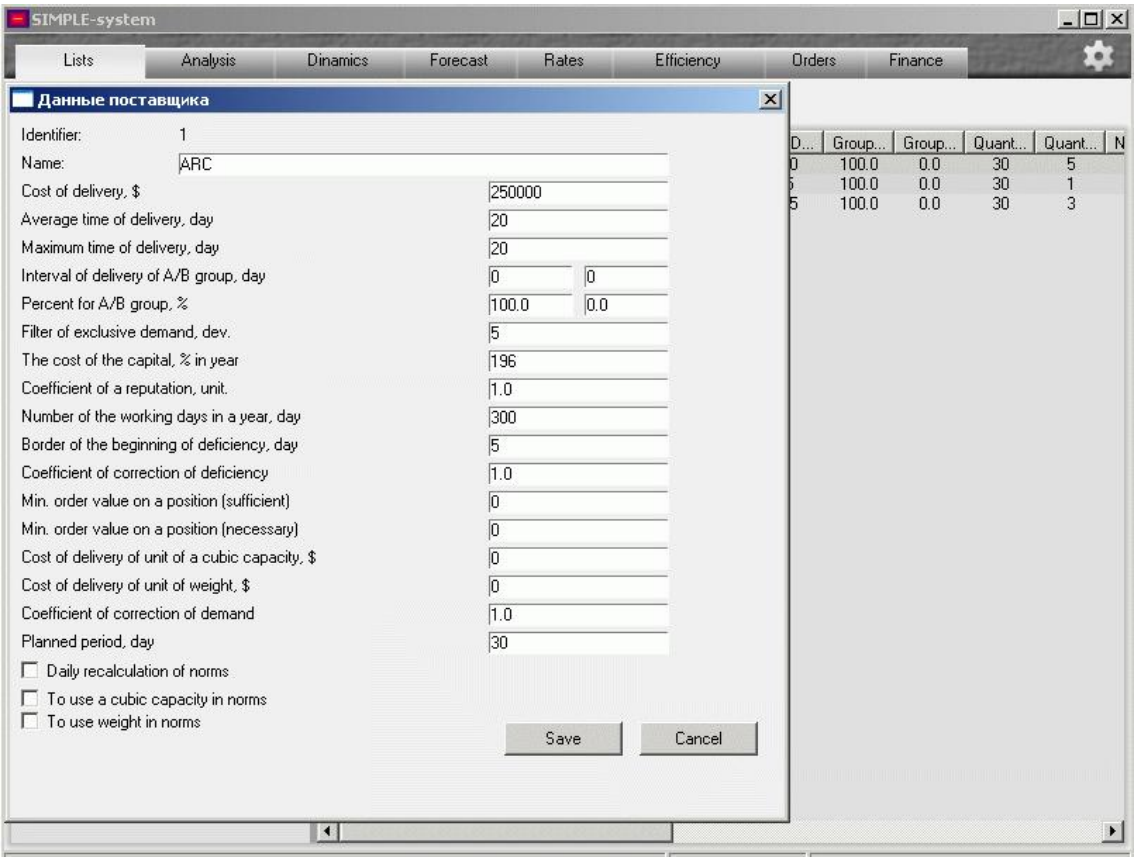
Picture 1. Actual stock dynamics of building materials wholesaler for 2005



Here we see how inventory actually moved in 2005 – one-moment incomes of many items from ARC supplier of building materials and subsequent sales from stock in fewer quantities until next order coming. Also in the table we see the average inventory calculation equal 3731578 dollars units and sales at purchase price 31507020 dollars. We also see annual return on inventory investment (%) = (Margin sold-Total Order Costs)/Average inventory = (10812331-3500000)/3731578=196%

Let us now simulate inventory management with holding costs of 196% that are taken as the actually achieved ROII level (see “actual” column at table – picture 1) and with an Order Cost = 250000 dollars per order as it is.

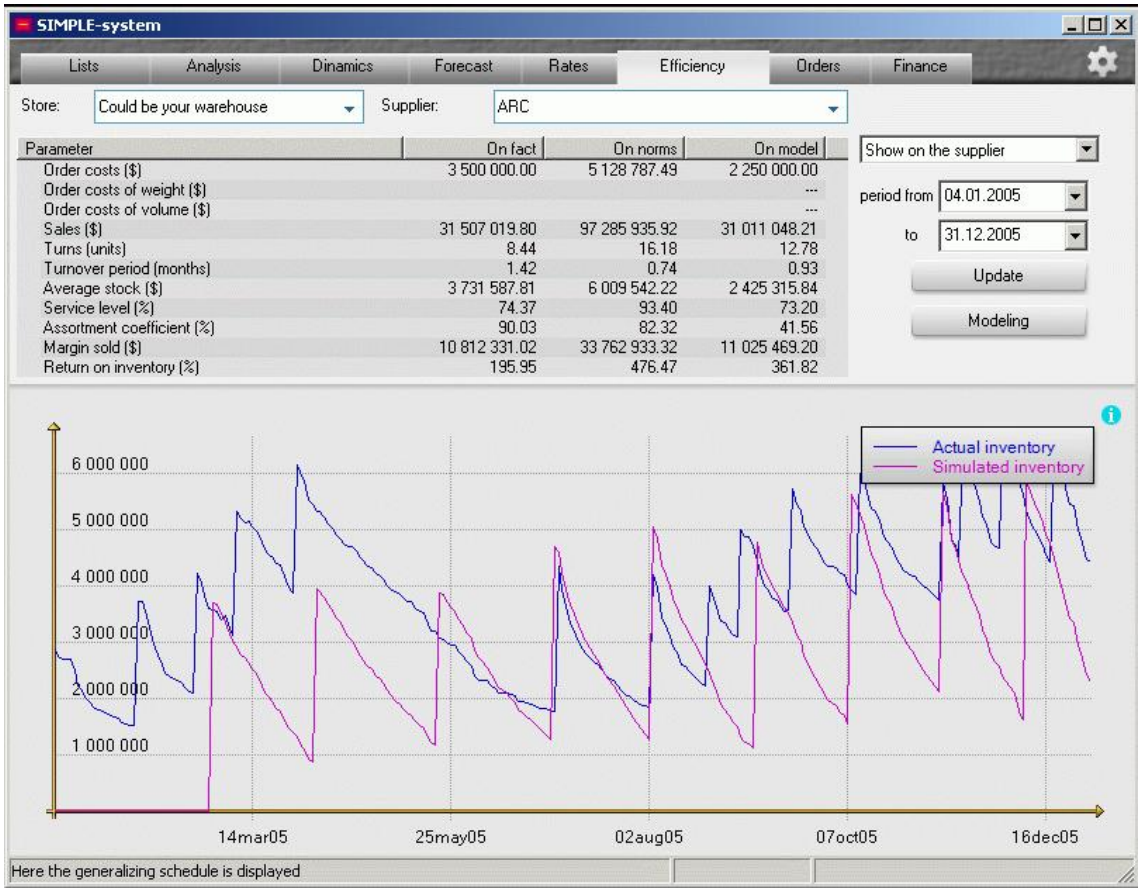
Picture 2. Parameters of SIMPLE-system model (holding Costs Assumption=196%, Order cost = 25000 dollars, Working days = 300 days)



Time between orders calculation would be: TBO = EOQ/Annual Sales*Working Days = 945210/31507020*300 = 9 working days where EOQ(economic order quantity) = ROOT (2*Annual Sales*Order Cost/Holding Cost) = ROOT (2*3150720*250000/1,96) = 945210 dollars.

Now let us simulate using these parameters of Order Cost and Holding Costs.

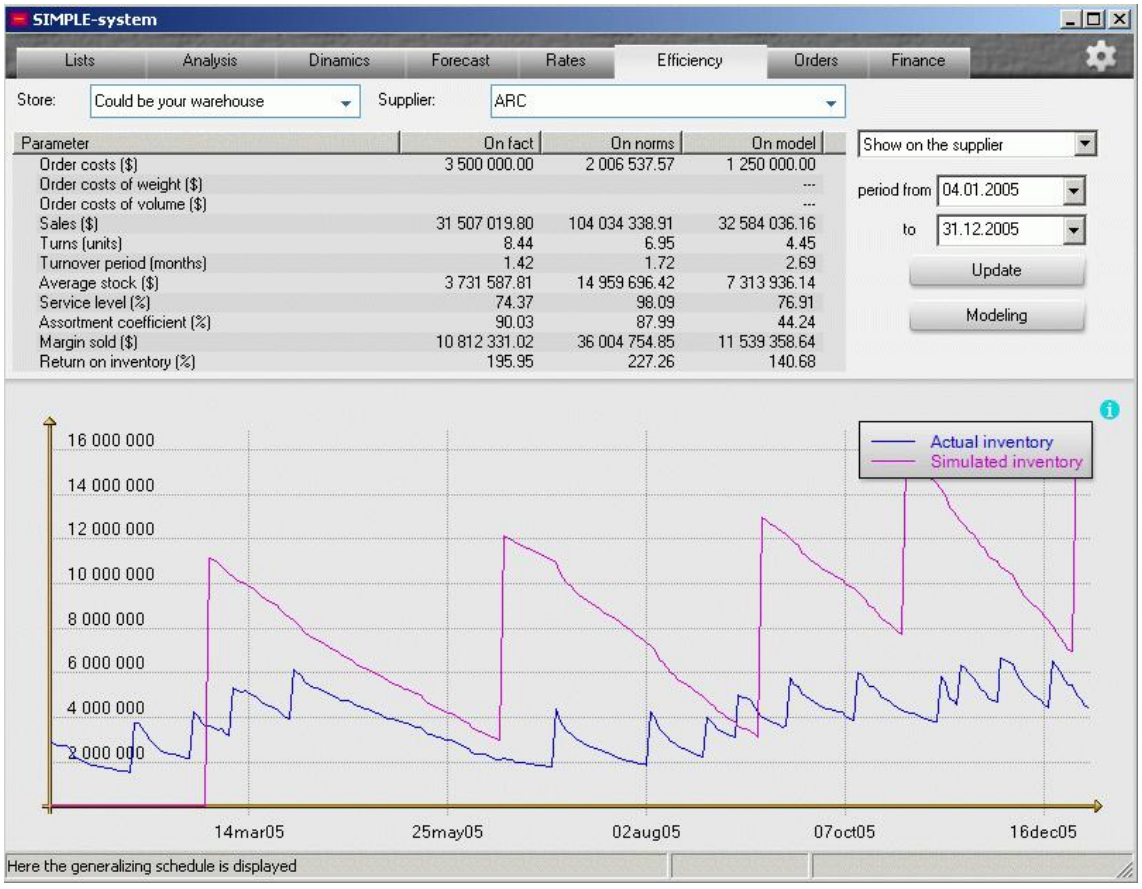
Picture 3. Actual and Simulated Dynamics (with Holding Costs parameter equal actual ROII=196%)



We see simulated dynamics added that show what could be if we used this policy earlier: all the positions come with reasonable Average time between orders and orders in dollars. Also optimization of inventory Limits calculated with Holding Costs parameter = 196% brings us an improvement: Return on Inventory rises up to 362% due to improvement in Average Stock, Order Costs, Sales and Margin Sold altogether (if we detach the initial period of simulation where it accumulates statistics to have first inventory limits).

Now let us assume we have holding costs of 30% (a common calculation calculation used of the holding costs to keep inventory). Calculations of TBO and EOQ are analogues and we omit them. The simulation results would be follows:

Picture 4. Actual and Simulated Dynamics (Holding Costs Assumption=30%)



The above is with the 30% holding costs in the EOQ

As far as simulation represents when we might expect if we apply a particular policy we cannot agree with traditional calculation approach. This supports the theoretical conclusion made in part 1 of the article:

- Capital should be allocated effectively
- There is always additional opportunity costs for inventory if the return on inventory could be higher
- Traditional approach leads to traditional costs minimisation but **reduces ROII** and also turnover. Probably, this fact limits the usage of well known Wilson formula in practice.

What could be inferred for practical use to make your material flows more effective is the following:

- EOQ is robust enough to calculate the optimal time between orders
- To use EOQ correctly, the value of the holding costs can be taken from the actual ROII level in the previous period
- The optimal time between orders calculations can be simply determined for each the supplier by using

steps 1-2 above

- The optimal average order for each the items and current stock is easily calculated from optimal time between orders from step 3 above

Reference: SIMPLE-system model with database considered