

Some years ago, when I worked at Novo Nordisk Engineering, it was a part of my job to make predictions of water and sewage quantities for future factories (also called water balances). To make things easier and comparable I developed a graphic mapping tool in Excel. It was and is still based on an upstream model where all calculations are chained together according to demand. All the elements in use are predefined blocks that are simply copied in place and linked together afterwards. The tool has proven OK for "static" scenarios e.g. total accumulated annual consumption and output.

I have later developed this idea up to a much higher level, where a true dynamic process can be modelled. It is still based on pre-defined blocks that can be placed and linked to become a picture of the entire process. The blocks are designed so that all sorts of process equipment can be modelled, e.g. pumps, tanks, delay lines, mixers, etc. Measuring points, various demands and unit costs can be defined to establish process inputs and outputs for logging and trend charts. All sorts of media (water, product, energy, etc) can be described and combined in the same model. It is even possible to link the model to online data via dde-calls.

Off course this is all great, but the real awesome feature that I have invented is a graphic compiler (written in VBA) that automatically analyzes the process picture on the screen, and compiles an execution list for all variable data. When a simulation is started, the list of data is updated in steps according to a predefined clock pulse. Editing, timing and simulation is controlled from a tool-bar generated by the program.

There are many features and possibilities, all too much to explain here, but I hope that the small video clip can give you an idea of what is going on.