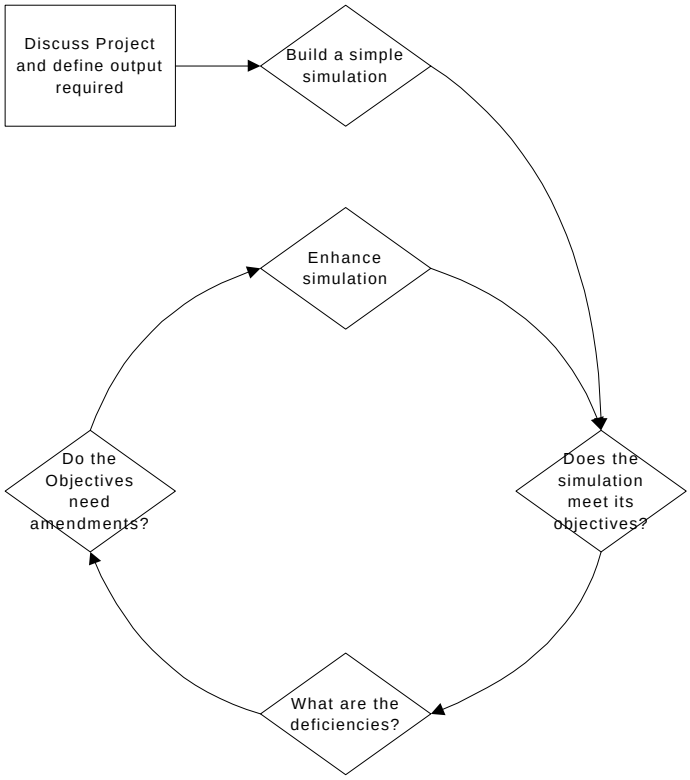
SIMUL8 is capable of simulating virtually any process in virtually any amount of detail. Most of the time you need only a fraction of this power to deliver the results you need to make decisions with confidence.

So, How Do I Build a Simulation?

Learning SIMUL8 is easy. Our Training Courses get high satisfaction scores, but before you start building a simulation it's worth taking a step back and thinking about what you are going to simulate and why.

Simulation professionals spend a lot of time at the start of a project understanding what the issues are and formulating ways to put a simulation together. The process they go through can be summarized like this:



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So a simulation professional or consultant will build a small simple simulation first of all, and only increase the breadth and depth if the results will be enhanced. They will always question the objectives of the simulation to ensure that maximum value is obtained from the project – it's common for simple simulations to answer all the questions, but for more, new, questions to arise taking the project off in a new direction.

The value in employing a simulation consultant is that a simulation is produced that will answer all the questions asked. Consultants go through a process of understanding the issues that are being faced, and then concentrating on the elements that will help in understanding and resolving the issues. This can result in smaller, tightly focused simulations that are designed to concentrate on a small number of issues.

Very often the simulation is a lot simpler than expected by a client. The client's questions are answered, however, as the consultant has gained experience in getting at the important factors.

It is easy for Process owners to see their processes as very complex, and indeed they usually are. However the skill of a consultant lies in being able to extract from the complexity of the process and the mass of data that surrounds it the elements that will provide the answers that are required in a timely and effective way.

So, Consultants are useful, but anyone can build a simulation. Our aim is to help you build your own simulations, by helping you to utilize a Consulting way of thinking so you can design a simulation of the right size and detail to get you the answers you need.

How SIMUL8 Corp can help

SIMUL8's Support Team is geared to helping you build your own simulations. We can help you with structuring the simulation, deciding on what to include and what to leave out, how to build the simulation towards results, and test the sensitivity of results to your inputs, so you know where to concentrate your time and efforts.

Try these simple rules, and ask the following questions when you start a new simulation:

- Start off with a simple flowchart drawn on paper: show the main events only.
- Build a simple simulation first and only increase complexity if it will improve results.
- Focus on results, and build the simulation towards delivering these.
- It's only a model! You don't usually need to recreate precisely what goes on, only the things that tie up your key resources or cause obstruction in the process.
- See the wood from the trees. Process Owners see the complexity and difficulty of management their process Try a more high level view and simulate only what you need to.

Ask these questions to help you focus:

1. What is the Objective of the simulation?
2. What, in the system, can be changed?
3. What are the measures of success?
4. What will happen if things are going wrong?

Remember that simulation uses and produces data. This means that you will need to measure and quantify the items of interest.

Case Study

This is a real case from our Tech Support Files:

Ian, a Warehouse Manager in a manufacturing company, was considering the impact of a production increase elsewhere in the company.

His function was to take in and store products manufactured in the plant, and also imported from sister plants, so that they can be dispatched to customers when required. There were over 120 product codes to manage, effectively different products, and a Warehouse Management System (WMS) allocated space in the warehouse to incoming stock based on the historic demand for each

line (higher demand lines were allocated space closer to the dispatch marshalling yards to minimize travel times). All products were on pallets, and pallets were never broken down into individual product units. The WMS was therefore a complex database that recorded where pallets were stored and worked out the most effective storage locations

Inside the warehouse a number of automated forklift trucks delivered and collected pallets to and from the storage bays - their journey times depended of course on the distances they traveled.

The questions Ian needed answers to were, following a production increase:

What space will be required in the warehouse?

What size of marshalling yard will be required?

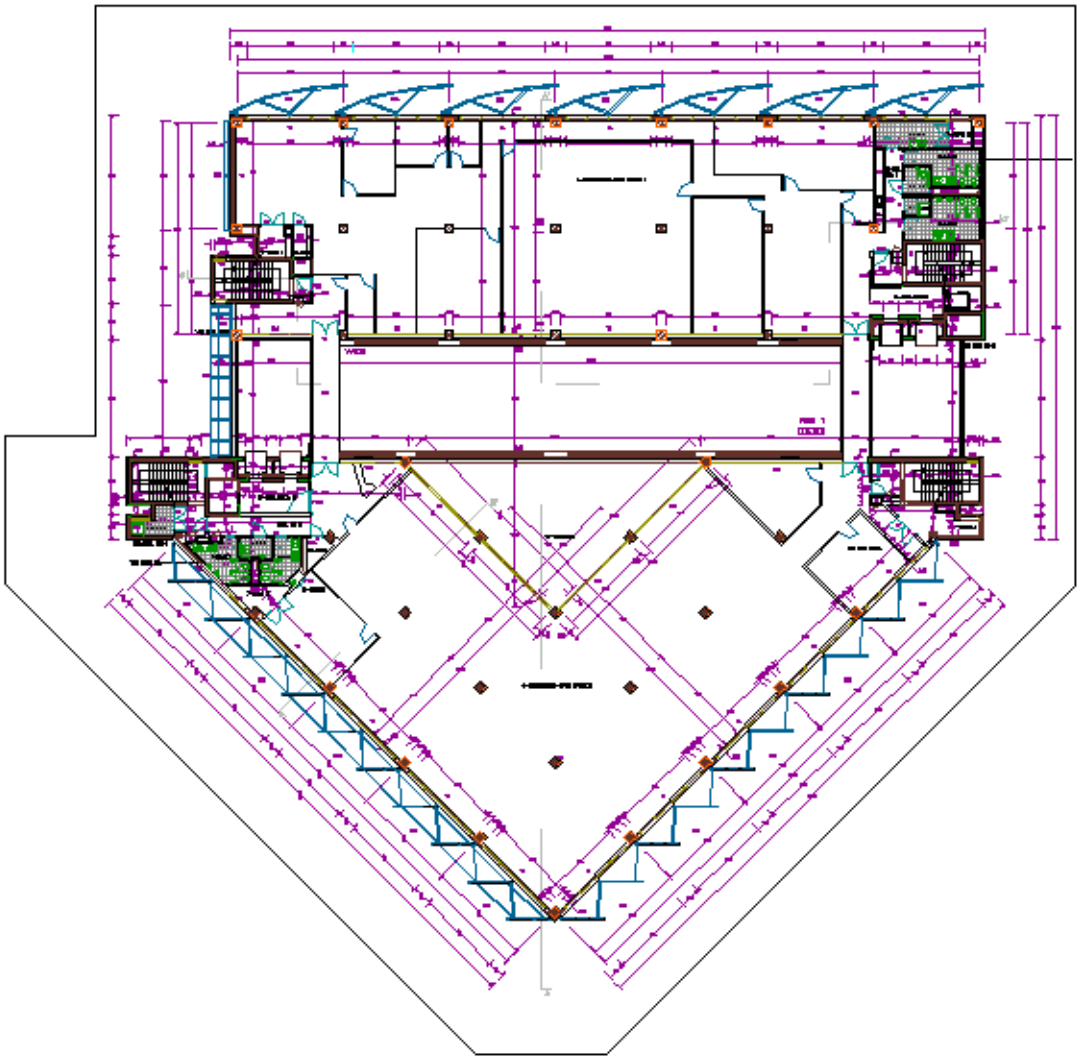
How many loading bays will be required?

How many trucks will be required?

Ian felt he was therefore, initially at least, faced with building a simulation of his entire warehouse, including the delivery, warehouse management, and dispatch systems. It seemed that the network of paths and the system for allocating stock to locations within the warehouse would need to be recreated – although it was already working fine.

Ian took a step back and looked at the problem again.

What he initially saw was a floor plan of his warehouse with many vehicles, items of plant and machinery, and people moving around.



warehouse plan

He didn't want to know how the warehouse worked – he already knew that and had software to manage it. He just wanted to know what space would be required. So with SIMUL8 Support's help he adopted a new "Consultant like" way of looking at the problem.

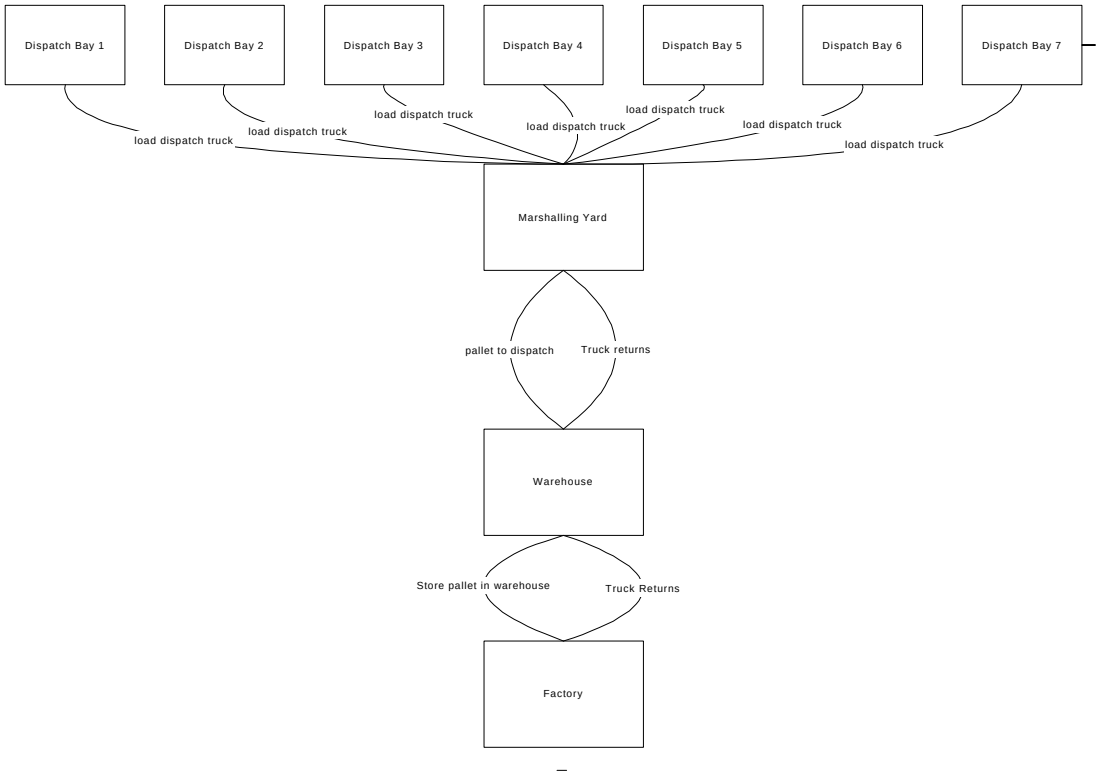
Pallets arrive into the warehouse at a certain rate – subject to minor fluctuations but reasonably steady over time. Pallets are then transported on trucks to an

almost random location somewhere in the warehouse, with the trucks taking a randomized but statistically predictable time to get there and back.

The important elements of the process were that a truck was required to transport goods around the warehouse, and they took an amount of time to do this. A shortage of trucks meant that pallets were not transported frequently enough, so the system would show signs of failure – stock building up inside the factory, and the marshalling yards starved of pallets meaning that deliveries to customers were delayed.

The customer demands for Pallets was randomized and subject to wide day-to-day fluctuations, although the transport process was very similar, with trucks taking some time to get each pallet and store it in the marshalling yard. Ian decided that the simulation was much simpler than it had first seemed. The time taken by trucks to store and collect pallets was the only important element of the internals of the warehouse that needed to be simulated, and this could be done very simply with standard SIMUL8 objects.

What Ian now saw:



simplified plan for simulation

In this view, Trucks connect the Factory to the warehouse, and then on to the Dispatch Bays.

Ian had the budget to change the size of the warehouse, expanding it as necessary and purchasing trucks as required. He would know if he had done a good job if the warehouse managed to store the increased production from the factory, without stock backing up and potentially disrupting the production line, and customer orders were dispatched on time.

The simulation met its requirements in that it allowed Ian to communicate to his managers the increase in warehouse capacity and number of trucks to cope with the new supply rate. Ian found the simple model easier to interpret and explain, and to collect the results he needed.

Ian's Learning Points

Ian decided to formalize his learning points:

Start off with a simple flowchart drawn on paper: show the main events only.

Build a simple simulation first and only increase complexity if it will improve results.

Focus on results, and build the simulation towards delivering these.

It's only a model! You don't usually need to recreate precisely what goes on, only the things that tie up your key resources or cause obstruction in the process.

See the wood from the trees. It's easy see the complexity and difficulty of management, but most of the time a more high level view needs to be taken.

Further Ian composed a list of rules and questions for himself before starting any new project;

- Quantify the Objectives of the simulation
- What are the measurable inputs that can be changed?
- What are the measures of success, and how are they measured?
- What are the symptoms of failure, and how are they measured?

By observing these simple rules Ian was able to stop and think his way around putting together a new simulation.

Summary:

It's easy to build a simulation that is large, impressive, but poorly thought out and therefore difficult to analyze. Small simple simulations can provide valuable and fast insights into a system, at a fraction of the man-hours required for larger projects. Thinking around the issues and how to put the simulation together can yield huge savings later on.

SIMUL8 can help with this. Contact your local Support Office for an introduction to how we can help.