

Training Program on Simulation Software for Industrial Engineers





Client Details

Industry: Manufacturing
Department: Industrial Engineering
Headquarters: Singapore
Status: One among the Global 500 list
Operating in: 30 Countries
Employees: 200,000
Learners: Industrial Engineers



Course Requirements

Tool: Flash
Number of modules: 9
Quiz: No
Interactivity level: Medium (Level 2)
Audio: Yes
Course duration: 3 Hours



Project Details

The customer's requirement was a training program on a simulation software that simulates manufacturing processes. With the help of this software, engineers create a virtual production line and test it without disturbing the actual system.

The existing training was in the form of an ILT session of about 3 days. The client wanted us to create an online training program that could be covered in 1 day.

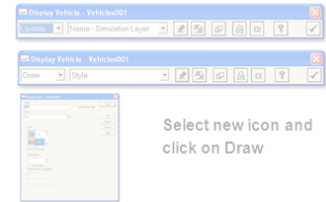
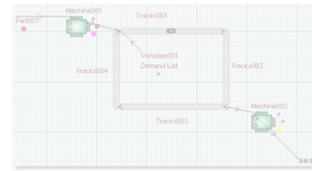


Content Details

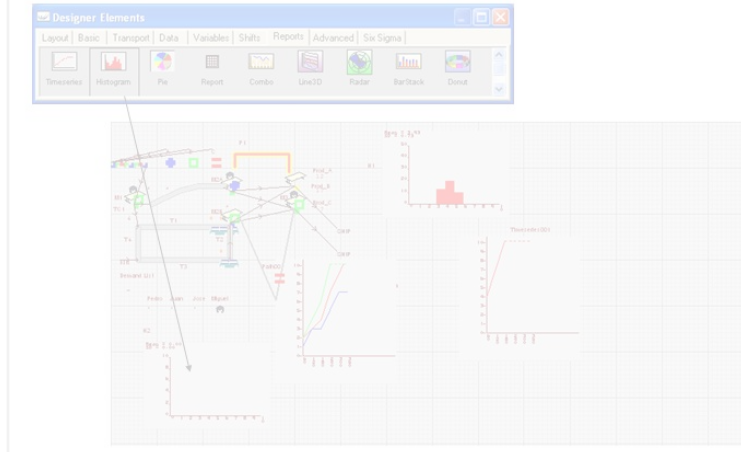
Source content	PDFs, PPTs, WebEx sessions
Content clarity	Average
Content Type	Concepts, Processes and Principles
Images	Yes
SME assistance	Yes

Track and Vehicles

1. Create parts and machines
2. Create tracks, preferred minimum three pieces
3. Create vehicle
4. Interconnect part to machine and tracks between them
5. Select place where vehicle enters the tracks using input rule at the vehicle or "To" Button using "PUSH to Tracks001(1)", usually vehicle enters the track in track 001.
6. Select track for loading use "PULL from Part001 out of Machine002"
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8. To change the vehicle icon follow these steps, right click → Display



Histogram



The screen shots of the software were provided by the client



Challenge

Content was a high-level overview of the software

- Content included complex technical terminology
- It was a collection of concepts, processes and principles

Content used complex technical terms

Conveyor

Index Time = $\frac{\text{Time to Travel from back to front}}{\text{Length in parts (Entries)}}$

Fixed: The conveyor maintains a constant distance between parts. If the conveyor stops, the distance between the parts on the conveyor remains the same. When a part reaches the front of a fixed conveyor and it is unable to move off, the entire conveyor will stop moving until the part at front can move off.

Queuing: The conveyor allows parts to accumulate. If the conveyor becomes blocked, the parts will slide together until the conveyor is full.

Indexed conveyors: Both types of indexed conveyors can be considered as number of positions, slots, or buckets, that each can contain one part regardless of its size. Parts are normally added at the last, or rear, position of the conveyor and move up one position after a specified index time until they reach the first or front position where they are normally removed. In the case of queuing conveyors, the slots (or buckets) slide together when the front of the conveyor stops. The parts are considered to move in Steps along the conveyor, each step being simulated at the index time of the conveyor.

Continuous conveyors: For both types of continuous conveyor, parts move along the length of the conveyor from its rear to its front at a specified speed. Unlike the indexed conveyors, the position of the parts on the conveyor is modeled in detail. When using continuous conveyors the physical size of the parts is taken into account.



CommLab Solution

Internet Research and WebEx sessions with the SME

- A lot of online research was done to understand the technical terminology
- WebEx sessions with the SME were very helpful in clarifying the content
- Concepts were explained using animations, resulting in more clarity

Animation was used to make concepts more clear

Index Time = $\frac{\text{Time to Travel from back to front}}{\text{Length in parts (Entries)}}$

Queuing

• Queuing conveyors allow parts to accumulate. If the conveyor becomes blocked, parts will slide together until the conveyor is full.

Movement of goods in production line shown through animation



Challenge

Short time for course development

The training program had 9 modules and had to be delivered in 45 days.

Deadline: 45 days

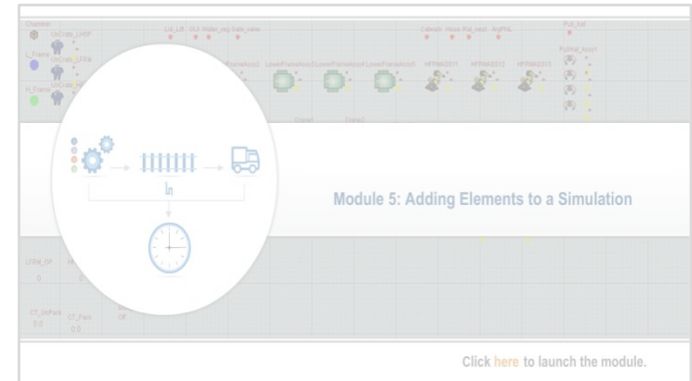


CommLab Solution

Team huddles everyday to avoid inconsistencies and deliver the project on-time

The team used to meet together in daily huddles. This was done to standardize the templates, visual style and finalize the instructional approach. This strategy helped cut down the time for development.

Standardized templates





Challenge

Missing content and unavailability of SME

- Content provided had a lot of inconsistencies.
- SME unavailability was another issue which resulted in delays.



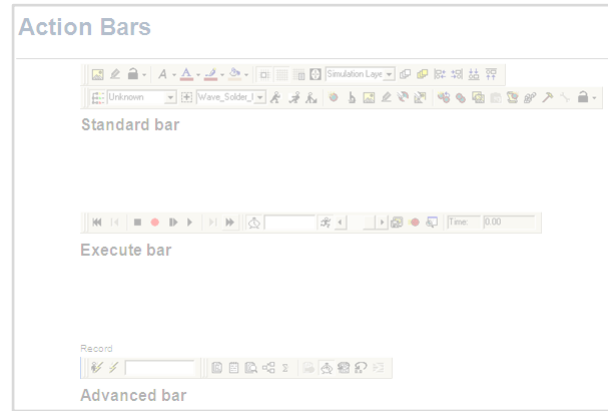
CommLab Solution

Taking the initiative to look for missing content

Online research was done for filling in gaps caused by the missing content. Researched information was sent to the SME for approval.

We had a sound communication plan in place and used several ways to contact the SME including WebEx sessions, sending queries via emails and direct calls.

Missing content



Following up with SME via emails and direct calls





Instructional

Job-aids and simulation videos

Job-aids in the form of PDFs were provided in the modules, so that the engineers could refer to them when they started using the software.

Videos of the software simulation were embedded in the modules so that the learners became familiar with the actual functionality of the software.



Visual

Icons to represent the concepts

There were many concepts throughout the 9 modules. In order to maintain consistency, icons were created to clearly represent various concepts.

These icons also helped the engineers to create mental-models for various concepts which were repeated throughout the training program.

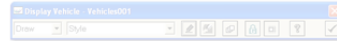
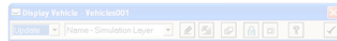
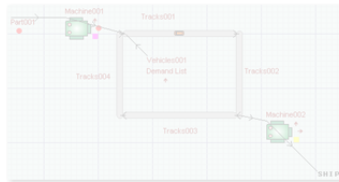
See the example in the next page.



Screenshot of the PPT

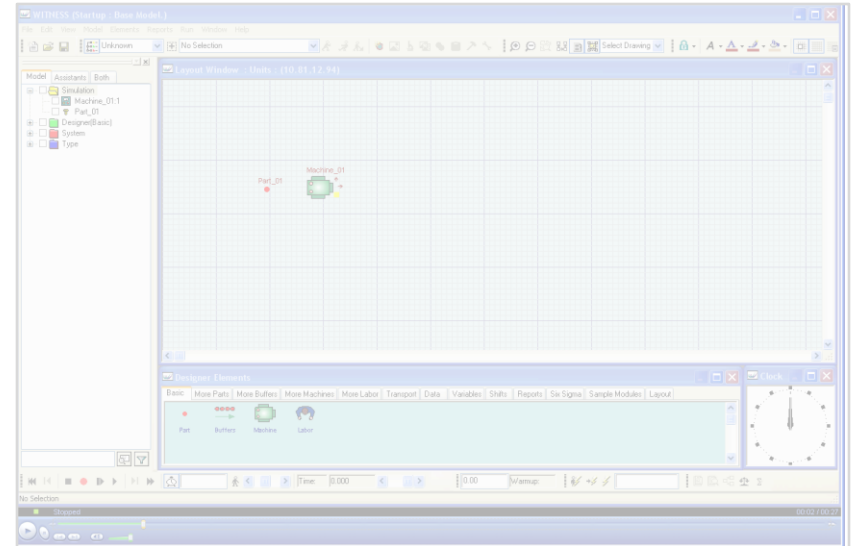
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Select new icon and click on Draw

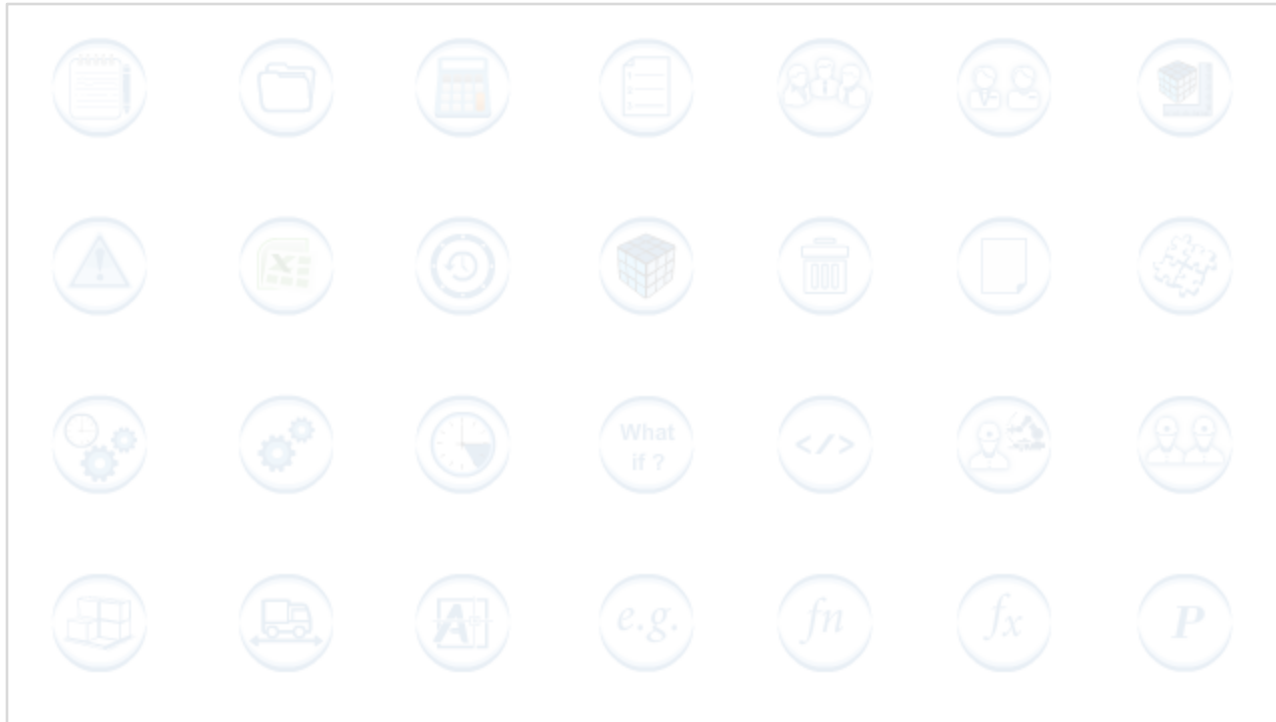
Snapshot of video showing software simulation





Visual

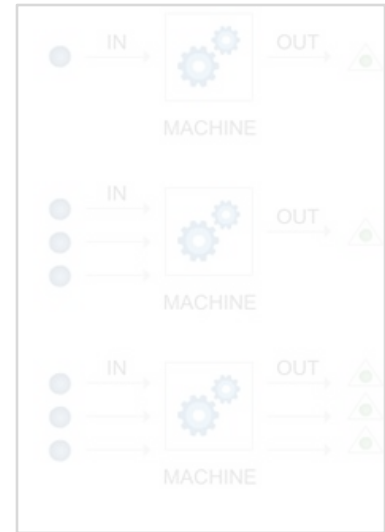
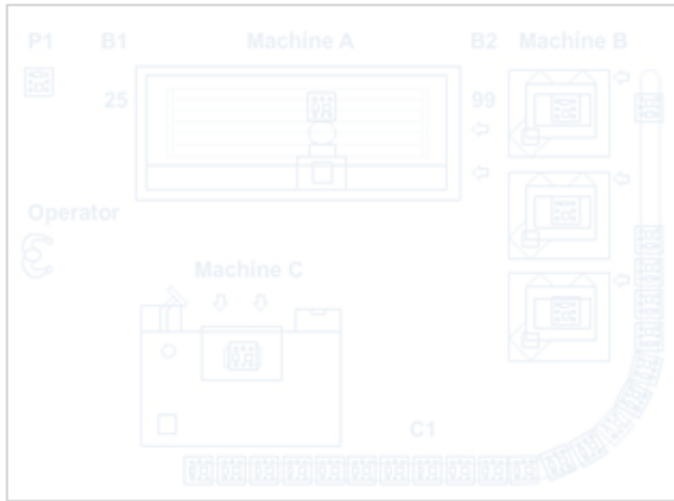
Icons were created for representing various concepts





Visual

Line diagrams were created to explain the process flow



E
X
A
M
P
L
E



Visual

Screenshot of the PPT


Building the model

- Build the model incrementally
- Test each stage thoroughly before building the next stage
- Avoid temptation to experiment before it is complete, it's better to have a complete, well tested, model to act as a benchmark to against which experimental results can be compared
- Remember the main elements in building a model are:
 - Creating elements (defining, displaying and detailing them)
 - Then link together with rules
 - You can also build more complex logic into your model by using actions

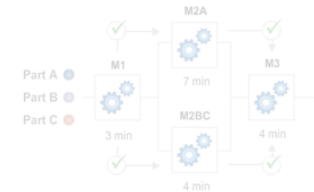
Line drawings and icons were used to make the content easy to understand

Step 5: Build the Model

Building a model:

-  Create elements (defining, displaying and detailing)
-  Link elements with rules
-  Build more complex logic into the model with actions

- Build the model incrementally.
- Test each stage thoroughly before building the next stage.



Complete and thoroughly test the model. Mark it as a benchmark against which experimental results can be compared.





Customer Feedback

As a result of online research, there was lots of useful information collected for the training program.

Looking at this information, the client feedback was :

“Excellent initiative on CommLab’s part finding this training document to supplement SME’s material.”

On the Alpha submission of the Module 5, the client’s feedback was :

“I like the look and feel a great deal – very clean and information is presented in an engaging way.”