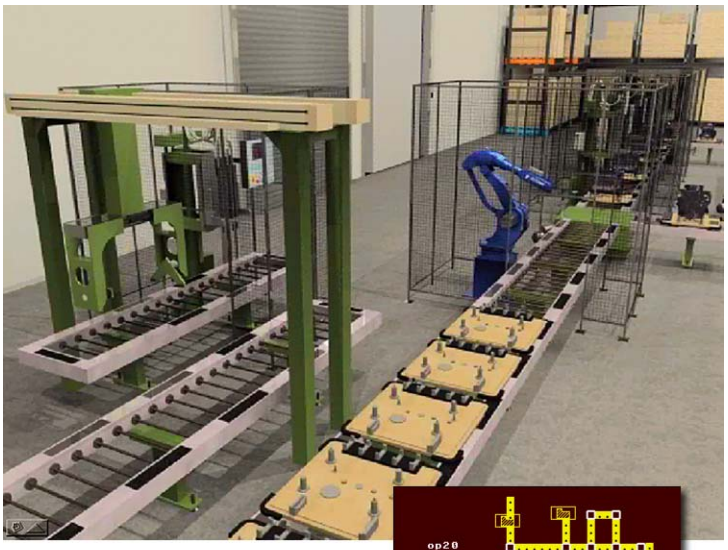
CASE STUDY

Ford Engine Assembly Line Simulation Tool

A massive amount of planning and investment goes into every new engine that Ford Motor Company design. In today's highly competitive climate, the speed to market for new products is crucial in maintaining competitive advantage. Ford have been using WITNESS since the mid-1980s to speed up the design of their engine manufacturing facilities. In that time many engine assembly lines have been simulated, with the model results being used to justify design decisions.



The Ford Assembly Simulation Tool (FAST) builds a WITNESS model of an engine assembly line from data contained within an Excel spreadsheet, without the user having to do anything in WITNESS other than press the "run" button.

Although the first impression is that one engine assembly line is much like another, there are usually sufficient differences to rule out the re-use of an existing model. Consequently a new WITNESS model has generally been constructed from first principles for each new engine assembly line. The drawback to this approach is the time it takes to build a brand new model and hence the delay in delivery of useful results.

As the rate of innovation has accelerated within Ford, it has been important to ensure that the decision support tools they use also keep pace with developments. With this in mind, John Ladbrook (Ford European Simulation Technical Specialist) and Andy Emmerson (Lanner Senior Consultant) have created a flexible interface to WITNESS that allows models of engine assembly lines to be built automatically. Dubbed FAST (Ford Assembly Simulation Tool), this interface builds a WITNESS model of an engine assembly line from data contained within an Excel spreadsheet, without the user having to do anything in WITNESS other than press the "run" button.

Lanner Group Limited.
The Oaks, Clews Road
Redditch, Worcs, B98 7ST
Phone: 01527 403400
Email: info@lanner.co.uk

www.lanner.com

Company	Ford Motor Company
Industry	Automotive Manufacturer
Application	Engine Line Planning
Benefit	Rapid Simulation Development

CASE STUDY

LANNER
the value of knowing

A new engine programme includes the preparation of a Work Standard and a scaled physical Layout Drawing. A Work Standard is a list of all the assembly operations that have to be performed to produce a finished engine, with each of the operations taking place at a different position along the assembly line. The Layout Drawing shows the physical position of these operations and the conveyoring required to link them together.

For simulation purposes, the Work Standard and Layout Drawing data are consolidated into a Microsoft Excel spreadsheet along with other information such as reliability and maintenance data, shift patterns and local control logic. When the data has all been entered the Excel application automatically generates the finished model.

A series of core WITNESS elements has been pre-defined to cover all the commonly used types of equipment found on an engine assembly line, e.g. automatic and manual operations plus line automation such as conveyors, divert stations and turntables. Positioning information ensures that each piece of equipment is displayed in the correct orientation and is correctly aligned relative to the preceding piece of equipment. Several functions within WITNESS automatically populate and link the elements together seamlessly to create a fully functional model without any further user intervention.

This approach has significantly reduced the time it takes to build a model. The main effort is now concentrated on amalgamating the Layout dimensions and Reliability data into a modified version of the Work Standard. Making adjustments to an existing model becomes trivial, requiring only the relevant part of the Simulation Work Standard to be updated. The reduction in model building and modification time has meant that more detailed programmes of investigation can be considered, with the results being available whilst those issues under consideration remain current.

Additional benefits include a consistent "look and feel" to these models, a reduction in validation testing due to the re-use of proven logic, and the opportunity for non-expert users to confidently build and use models.

Ford are now looking to expand the use of this technology across a range of other areas, including the machining lines that produce items such as cylinder heads, engine blocks and crankshafts.

Ford see the FAST tool as a significant step forward in their continued drive to roll out powerful analytical technologies to the workplace.

www.lanner.com

About Lanner Group

Lanner helps organisations achieve rapid and effective business change. Based in the UK with subsidiaries and partners in Europe, the Americas and the Far East, Lanner works with more than 3000 top multi-national companies.