CASE STUDY

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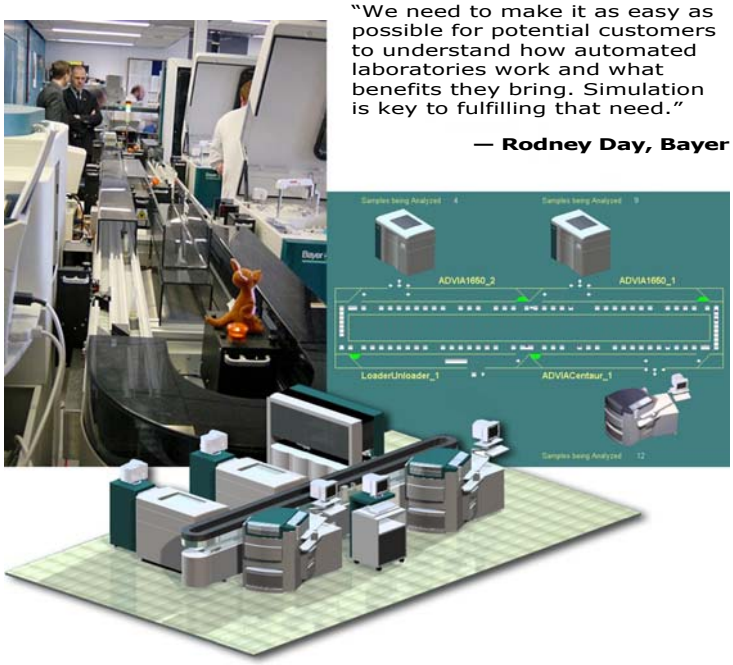
WITNESS Helps Bayer Sell Automated Laboratories

Bayer

Today's healthcare sector is experiencing a growing demand for increasingly sophisticated laboratory testing procedures. With pressure to keep budgets lean, many laboratories are being asked to increase performance in terms of the diversity and volume of tests. The goal these days is to maximise output while minimising "cost per reportable." Automated laboratories offer the potential for improving flexibility, efficiency, cost effectiveness and productivity. They enable a greater number and wider range of tests to be carried out by fewer people. Systems like these can deliver the all-important lower cost per reportable, while providing greater capacity. The downside is that an automated laboratory system does not come cheap, with the initial capital investment in a fully automated, customised system running into six- or seven-figure sums.



"We need to make it as easy as possible for potential customers to understand how automated laboratories work and what benefits they bring. Simulation is key to fulfilling that need."

— Rodney Day, Bayer

This capital expenditure has to be justified to both laboratory managers and those that hold the purse strings with a cast-iron guarantee that it can deliver measurable benefits and significant long-term savings. No one will invest in an automated laboratory system without the conviction that it will work cost-effectively.

There is another problem with the process of considering a move to automation. The way an automated laboratory actually operates compared with existing procedures can be difficult to explain to laboratory managers and staff. For most, it is a totally new concept. Acceptance of automated laboratories is made more difficult by all the quantitative variables involved—numerous types of tests (and the time they each take to complete), variability in the required throughput, staffing levels and operating procedures.

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Company	Bayer Diagnostics
Industry	Chemical/Pharmaceutical
Application	Sales Demonstration System
Benefit	Faster Buy-in by Potential Customers

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Medical equipment giant Bayer Diagnostics needed a means to help illustrate the physical makeup and achievable benefits of the customised automated laboratory solutions that the company was proposing to its customers. The company also needed to prove the promise of fiscal savings and justify the capital expenditure to withstand the close scrutiny of the healthcare financial management. For these reasons, Bayer Diagnostics adopted Lanner Group's WITNESS simulation tool to play a key role in the specification, configuration and installation of automated laboratory systems.

Lanner has developed for Bayer a "generic" model that is customised for each laboratory site to illustrate how the automated laboratory system operates. This model was initially aimed at a relatively small group of users. These were the Bayer Consultants who operate in the high end of the laboratory automation field, involved in fully customisable solutions with upwards of five to 12 analysers. The audience was then widened to include those Bayer personnel involved in the simpler ADVIA WorkCell configurations of around four analysers.

The model uses graphical icons (derived from photographs of the real equipment) to represent the physical layout of the automated laboratory showing analysis equipment, work cells, conveyors, personnel, etc. Bayer consultants can then adapt this model by using the customer's own real data to input information on:

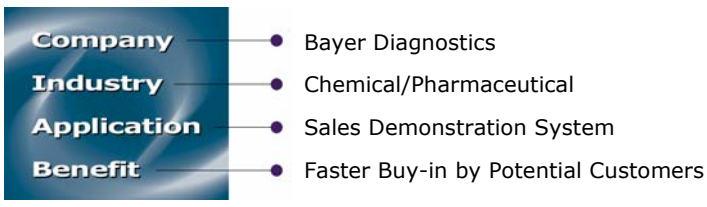
- different types of tubes (centrifuge and non-centrifuge, e.g.)
- volumes of throughput
- timing of arrival at tubes (from GPs etc)
- types of test (specific to individual hospitals)
- time taken by specific types of test
- proportions of STATs (urgent tubes)
- number and specification of analysers
- layout

All this data exists, often from workflow analysis spreadsheets, and is readily available to populate the model. With this data, it is possible to build and run a "virtual pilot" of the proposed laboratory, thereby showing what can be gained from implementing such a system.

The data is input using an application developed in Excel and fully validated to minimise data errors. The selection of analysers and how they are laid out is also done via Excel. The WITNESS model is then automatically configured. This architecture is supported by the Lanner SIMBA framework, which enables the development of simulation-based applications.

The model examines the efficiency of workflow and identifies potential bottlenecks. Graphically, it shows test turnaround time, length of time tubes are in the system, and the number of tests outstanding at any time. Various "what-if" scenarios can also be created to help plan response to planned and unplanned downtime and disaster recovery situations.

Bayer had tried other simulation software tools, but found them cumbersome to use. During presentations, Bayer consultants would have to stop the models, collect data, output it to another program and then generate reports. Previously Excel-based models were used. These were not very accurate due to the complex interactions between analysers, transport mechanisms and the time-based variations in requirements. It was not at all easy to grasp the information being provided. But with WITNESS input data, histograms or pie charts of current statistics can all be easily accessed while the model is running. Additionally, detailed data is sent to Excel to provide an easily modifiable detailed analysis.



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Bayer reports that the main strength of WITNESS based models is the ability to graphically indicate results and watch the "virtual pilot" at your own pace, which makes it easier to demonstrate complicated systems to people who are not industrial engineers or simulation experts.

WITNESS cuts out the guesswork and reduces turnaround time on producing and simplifying answers. Bayer can now simulate proposals, investigate changes in workflow, see the effect of specific instruments being off-line, and develop robust operational procedures, all in partnership with the customer. By working so closely with the customer, Bayer consultants break down barriers and create a high level of understanding, which enables the customer to better accept and appreciate the benefits of the proposed automation.

For Bayer, simulation has become an indispensable tool in the consulting process. Simulation provides a means of clearly visualising the complex processes of an automated laboratory. It also helps justify the substantial capital expenditure of automation. Finally, WITNESS helps Bayer analyse how specific systems can be customised to individual user requirements to deliver maximum productivity and optimum flexibility at minimum cost.

As Rodney Day, Bayer Diagnostics' marketing director for laboratory automation, information and consulting services, puts it: "We needed to make it as easy as possible for potential customers to understand how automated laboratory systems work and what benefits they can bring. Simulation modelling is key to fulfilling that need."

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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.