

Begin with the end in mind

New challenges lie ahead for informatics, says **Peter Boogaard**, founder of independent consultancy firm Industrial Lab Automation

It was just 240 months ago, on 6 August 1991, that the World Wide Web was born. In 2009, human beings generated more data than in all previous 5,000 years combined! Within 10 years we will all have digital copies of our DNA. Products, services, customer contact, production processes, working methods, entertainment, healthcare – everything is affected by digitisation. The old paradigm that invention requires only the best people and experts has changed to an environment where innovation is encouraged throughout the whole organisation. Eliminating barriers to enable cross-functional collaboration between research, development, quality assurance and manufacturing for faster time to market, increased revenues and profitability, are at the top of the executive's priorities.

The rich information and knowledge gathered in laboratories around the globe will be, more than ever, the *scientific single point of truth* that supports the multi-disciplinary teams within an organisation. Significant social and technological breakthroughs will require a fundamental rethink and re-design to fulfil and sustain these new strategies. Digital normalisation will be entering the laboratory sooner than probably anticipated. Overall, the scientific software industry is creating superb technology breakthroughs, but is often lacking behind other industries when it comes to translating these technology innovations into viable business solutions.

Think exponential

This decade, traditional mainstream Laboratory Information Management Systems (LIMS) will face new challenges. LIMS have been brilliant tools for managing predictable and repeatable planned sample, test and study data flows, and creating structured data from that generated by laboratories. In R&D environments, however, unpredictable workflows creating massive amounts of unstructured data showed that current LIMS systems lack the capability to effectively manage this throughput.

Alternatively, Electronic Laboratory Notebooks (ELNs) are a great tool to capture and share complex scientific experiments, while an underlying Scientific Data Management System (SDMS) is used to manage these large volumes of data seamlessly. For example, many ELN applications include LIMS-like native



instrument interface capabilities to decrease transcription errors.

World-class ERP solutions offer unique extensions to include LIMS and CAPA (Corrective Actions and Preventive Actions) functionality to cover mainstream method execution workflows and comply with the strict regulations, as defined by the US FDA and other regulatory bodies. There are many prejudices that say the ERP system cannot replace all LIMS functionality. That may have been true in the past, but what if we were to adopt industry best practices and workflows and extend the ERP solution with QM/LIMS functionality, and additionally deploy a modern native ELN for the remaining laboratory functions? We then take full advantage of the new technologies! It is time to rethink. The days that software applications position themselves as the centre of the universe and build sub-systems around them are over.

DNA reset

Growth and innovation are stimulated throughout open and collaborative organisations, and no longer by concentrating on the best people and experts only. ARC Advisory Group predicts LIMS Software-as-a-Service (SaaS) will emerge and expects to see a growth of almost three per cent over the next five years to \$454 million in 2013. In addition, Gartner predicts that by 2015, 80 per cent of enterprises using external cloud services will demand independent certification that providers can restore operations and data.

The recent Amazon cloud hiccup will be a great lesson for the industry and show how we will treat transparency as a competitive

advantage. The result will be a validatable, scalable and affordable infrastructure. Web 2.0 will be the backbone of web-based LIMS versions for decentralised decision making as it enables syndication of both content and services.

Stephen Covey, author of *The 7 habits of highly effective people*, stated very early on: 'Seek first to understand... then to be understood.' Do we really need to upgrade our LIMS? What is the real benefit to extending LIMS with an ELN? Should we replace LIMS and extend ERP functionality? What will SDMS bring? Avoid thinking in technical solutions before having identified and examined what the company is aiming for. Before homing in on the question of 'how', the 'what' and 'why' are far more critical in assuring the right strategy is chosen. The challenge to adopt the irreversible digitalisation process in a conservative market is huge. Significant rewards are ahead of us, when the industry is willing to rethink, team-up and act with the end in mind.

Q&A:

How to address societal pressures on environmental responsibilities?

A paperless laboratory operation may be an answer.

A scalable, collaborative, secured environment that aids researchers and biologists effectively and efficiently in their research projects?

The laboratory is a critical repository for analytical and biological data. A collaborative research ELN platform potentially using SaaS and cloud could be the answer.

How to deliver the best service for customers and suppliers?

Business Intelligence (BI) knowledge centres may underpin these questions. Agile methodology with IT involvement could be highly recommended.

How to simplify business processes?

External independent consultancy may identify areas for system integration and consolidation not limited to a platform of technologies legacy.