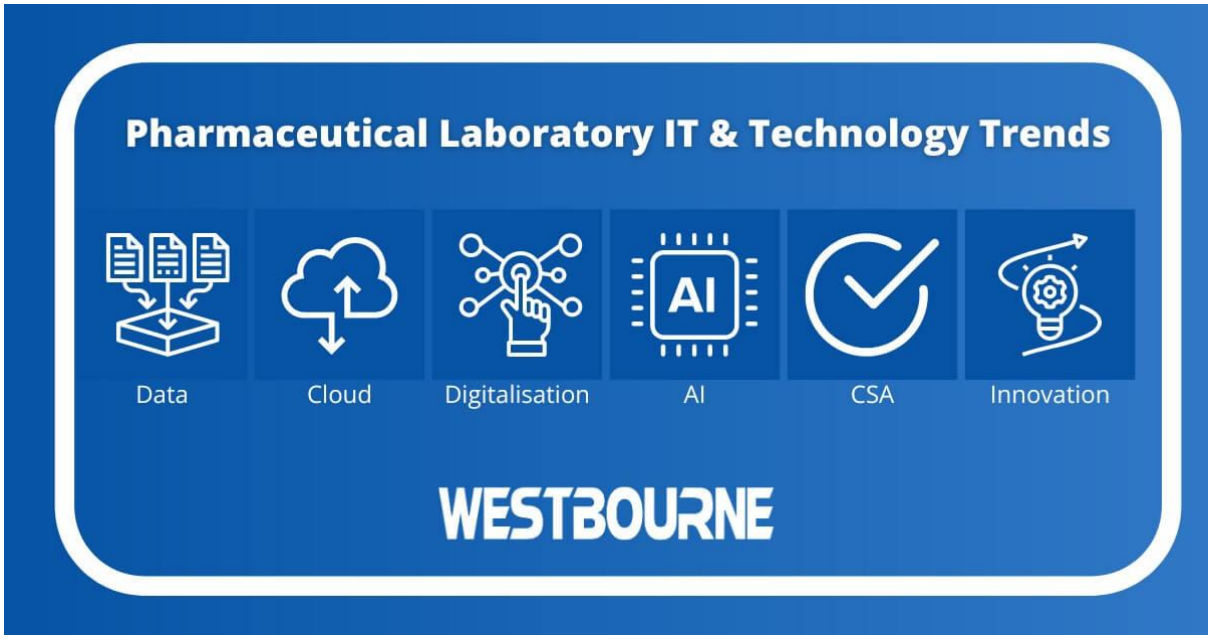
2024 Pharmaceutical Laboratory IT and Technology Trends

Digitalisation, Industry 54.0, smart manufacturing, and Quality 54.0 are buzzwords that will continue to have significant meaning in 2024 as pharmaceutical businesses strive for growth and drive innovation. Laboratories play a significant role in the success of any pharmaceutical manufacturing operation, so what are the trends to be aware of to ensure your lab keeps up with the necessary pace of change?

In this blog, we are going to focus specifically on the laboratory IT and technology trends that will dominate decision-making in 2024, as lab IT and technology are our areas of expertise here at Westbourne IT.

We also have considerable regulatory and compliance expertise – you can read our blog on 2024 regulatory trends here.

Laboratory IT and Technology Trends for the Pharmaceutical Industry



Data Management and Analytics

Putting data to use and extracting maximum benefit from data is one of the big focus areas for many pharmaceutical organisations. It is a multi-faceted topic that has applications across all areas of business, including manufacturing, supply chain management, quality control, laboratory operations, and compliance.

Given the broad scope of data management and analytics, in addition to the nature of pharmaceutical manufacturing operations (legacy systems, fragmented datasets, inconsistent standards, etc), this is an area of technology and IT that is a journey rather than a single-point solution.

Therefore, the trend in 2024 is that pharmaceutical laboratories will continue on their data management and analytics journeys, implementing strategies and projects that achieve key milestones. Examples include:

- Introducing or upgrading modern technologies such as LIMS
- Integrating systems and improving connectivity
- Eliminating manual data entry and processing
- Creating data standards and implementing solutions that ensure data is structured
- Developing data dashboards and reports that deliver meaningful insights and enable data-driven decision-making

Cloud Migration and IT Modernisation

There are a number of factors that are driving cloud migration and IT modernisation projects in pharmaceutical laboratories. Some examples include:

- Cost pressures, especially in relation to the cost (and cost complexity) of hardware and licencing.
- Versions of Microsoft Windows and other key software applications nearing end-of-life deadlines.
- User experience and the push to ensure technology facilitates productivity and innovation by minimising situations where technology gets in the way.
- The growing importance of bridging the IT and OT (operational technology) gap.

Throughout 2024 and beyond, pharmaceutical laboratories will continue to explore opportunities in cloud technologies, Windows 11 migrations, and infrastructure modernisation and consolidation.

Increasing Pace of Digitalisation

The pace of digitalisation in pharmaceutical laboratories is also likely to increase in 2024. Digitalisation solutions and technologies are helping pharmaceutical companies to become more productive and efficient. Digitalisation also helps companies overcome the challenges that currently exist in the industry, from skills shortages to increasing transparency requirements from regulators.

Artificial Intelligence (AI)

All companies are exploring the potential uses of AI, and there is considerable excitement about the possibilities for the pharmaceutical industry, especially in areas like product research and development. AI as part of the evolution into Industry 5.0 will also play an increasingly important role in the day-to-day tasks of pharmaceutical manufacturing, supply chain management, and quality control.

As a result, the use of AI will be a trend throughout 2024 and beyond but there is another AI-related trend that is also important – ensuring the use of AI in the pharmaceutical industry is responsible and ethical. Debates and discussions on these topics will be a feature of the coming months and years.

Computer Software Assurance

The validation of computer equipment and software applications in the life sciences sector is changing with the publication by the FDA in 2022 of its draft CSA (computer software assurance) guidance. As a result, we will see more and more pharmaceutical operations transitioning away from the traditional CSV (computer software validation) method of validation to CSA and its risk-based, critical-thinking approach. Read more about transitioning from CSV to CSA on our blog.

Adaptability and Process Innovation

There are game-changing innovations taking place in the pharmaceutical industry that are set to have a transformative effect on patient care and health outcomes. A few examples

include personalised medicines, the growing use of cell and gene therapies, and the development of new combination products that include both medical devices and pharmaceutical products.

Laboratory operations will need to evolve and adapt to ensure processes and procedures keep up with the pace of change. Technology solutions will play an important role in the evolution of the pharmaceutical industry and laboratory operations.

Continuous Improvement for Today and Tomorrow

The changes taking place ~~in~~as the pharmaceutical industry transitions from Industry 4.0 to Industry 5.0~~, including changes highlighted by the trends described above,~~ aim to improve the efficiency and effectiveness of drug discovery, development, and distribution, with a strong emphasis on patient safety, compliance, productivity, employee wellbeing, and profitability. This includes the changes highlighted by the trends described above.

-Staying on top of these trends and continuing to develop and improve the use of technology and data are essential for pharmaceutical organisations.