

Lab Informatics at the Centre of Digital Transformation Strategies

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Enterprises, whether oil and gas companies, pharmaceutical manufacturers, or multinational food and beverage companies, each sit atop a vast collection of data. Extracting, exploring, connecting, analysing, predicting, modelling, and otherwise leveraging that data is at the heart of digital transformation – of converting that data into knowledge that, in turn, improves outcomes.

Such data exploitation, however, increasingly relies on an enterprise-wide digital ecosystem, one that truly breaks down barriers and fundamentally changes the way organisations use technology and data to reduce risks, accelerate innovation, and drive revenue growth. It's an ecosystem of shared solutions and data sources that collectively creates a virtuous circle of continuous learning, improvement, and innovation.

Laboratories are central to this data-driven perspective, as laboratory informatics systems and platforms both generate and house the data that can fuel new insights. But these lab informatics solutions must be part the digital ecosystem to yield the biggest benefit.

And what is that benefit? The big promise driving investment in digital transformation strategies - estimated at 40% of all technology spending [1] - is top-line revenue growth. Business leaders are looking to digital transformation to drive down costs and increase opportunities, based on a deeper dive into the data they have at their fingertips, using advanced analytics, predictive modelling, AI, and more. The digital ecosystem - no longer disjointed systems - releases the flow of data throughout an organisation and enables both scientific and business users to apply advance analytics to identify patterns and trends, isolate risks, eliminate bottlenecks, and uncover concealed opportunities for innovation.

It's why one leading biotech built a digital-native facility that overturned established drug-development methodologies, instituting a much faster, more agile production cycle. And why a global consumer packaged goods giant connected its 100+ manufacturing plants and multiple R&D centres worldwide to a centralised corporate data lake, giving researchers and other users an opportunity to interrogate its treasure trove with powerful AI and advanced analytics capabilities. Digital transformation is how an oil & gas multinational intends to increase efficiencies, reduce its overall energy consumption, increase production, and ensure R&D investments are prioritised around initiatives that are most likely to pay off.

The common thread between these three digital journeys is the inclusion of the lab, and its informatics platforms, in the ecosystem: laboratory information management systems (LIMS), electronic laboratory notebooks (ELN), scientific data management systems (SDMS), and more. All the data generated by these systems feeds into a larger ecosystem. But rather than simply stocking a data lake, these transformations provide a consolidated, 360-degree view of the entire organisation, unleashing the insights that drive innovation, productivity, discovery, and more.

More directly, a well-executed digital strategy can positively impact laboratory objectives, including:

- Higher throughput: The speed of the development lifecycle relies on data-driven insights, and digitally savvy companies see a rise in efficiency, performance, and scalability.
- Lowered risk: The seamless integration created by digital transformation significantly limits the opportunity for error where one process interacts with another.
- Sustained regulatory compliance: Data complexity and evolving regulations are no match for the ongoing transparency and compliance supported by a digital ecosystem.
- Improved quality: Senior business leaders and researchers alike develop a sharper sense of ongoing patterns and trends as visibility to more data emerges, enabling proactive decision-making that drives quality.

Initiating a Digital Transformation

The impetus to transform is clear. In fact, IDC [2] projected \$1.25 trillion in worldwide digital transformation spending in 2019, with discrete manufacturing and process manufacturing investing \$220 billion and \$135 billion, respectively. These industries are targeting a combined \$167 investment in smart manufacturing, \$46 billion in digital innovation, and \$29 billion in digital supply chain optimisation, according to IDC.

What, then, is the best process to get going with a digital transformation? We suggest selecting:

- the right team – including the right technology partners
- the right strategy
- the right technology
- the right KPIs

A visionary executive leadership team - one that sees the value of investing in technology to unleash innovation - is essential to a successful digital transformation. Working with the CIO and IT, these leaders can create the forward momentum and corporate culture that welcomes a dramatic, yet rewarding, organisational change.

This internal team would be wise to identify and partner with external experts who possess domain or industry experience as well as a record of sustained technological innovation. As vendors supplying the technologies to propel digital transformation, these partners help ensure the ecosystem is self-supporting, with each element fitting into its place, akin to a Rube Goldberg machine.

When it comes to setting your digital strategy, three questions can bring clarity to your unique business objectives and show the way forward:

1. What are we trying to achieve through transformation?
2. How can we empower people, overhaul processes, and change technologies to drive growth?
3. What opportunities exist to eliminate redundancies, replicate successes, and remove obstacles that impair innovation and speed?

The answers to these questions inform your digital strategy. Another consideration, however, is the pace at which you want to move; while some organisations will be tempted to reboot all at once, others can mire themselves in indecision and not proceed at all. The wise organisation is one that threads this needle, finding a patient, incremental rollout plan that ensures all new systems and platforms are configured to work smoothly together and that manages change for system users who may be fearful, resistant, or uncertain of their roles as digital transformation takes root.

Hand-in-hand with strategy is navigating the informatics solutions landscape. Here, you must identify partners who understand your goals and processes, and can demonstrate how their technologies add value and drive interconnectivity necessary to your transformational journey. A word of caution when selecting technologies: carefully evaluate your legacy process to determine if it's holding you back and consider, instead, whether you should redefine that process based on available, best-in-class technology.

Finally, anyone starting a journey wants to ensure they stay on track and arrive at their intended destination. Key Performance Indicators, established as part of your strategy, let you manage your digital transformation as it comes to life. Make sure your KPIs are clear, specific, and map back to the business objectives you have set, enabling you to course-correct as necessary and guiding you to a successful transformation.

More than Technology

Digital transformation is much more than a technology journey; it's a business journey that uses technology as its vehicle. Organisations with laboratories must include their lab informatics solutions – and partners – in this journey. In fact, many begin their transformations in the lab, where a highly integrated and flexible LIMS deployment can accelerate data transfer and contribute to the broader analytics capabilities of the enterprise as a whole. Successful pilots at the lab level can be rolled out further across the organisation, expanding the journey to greater agility, innovation, and data-driven business growth.

References

1. https://images.idgesg.net/assets/2018/01/state_of_the_cio_01_ciod_winter_final.pdf
2. <https://www.idc.com/getdoc.jsp?containerId=prUS44440318>