The supply chains of Life Sciences and Healthcare (LSH) companies are undergoing significant transformation.

Under pressure to deliver more affordable, quality healthcare, the sector also faces many other challenges – from factors such as increasing regulation and counterfeiting, to new players entering the market.

Previously slow to adopt cutting edge technologies in its supply chains, Life Sciences & Healthcare has ranked in the bottom 20th percentile in the digitalization index.

So how then should a third-party logistics firm and its LSH customers use new digital technologies to make a step change? We spoke to Solutions Design experts from DHL Supply Chain for their views.

It starts with data...
For Andreas Pilling, Senior Manager, Solutions Design, the key to tackling the challenges within the LSH supply chain starts with data: “If I had a wish list for customers, top of that list would be that they had a really good data overview. Many customers find it difficult to dig down into the very good data they have at hand. But if there was centralized, standardized master data in a secure place, it would really be of benefit. For us, it always starts with data analysis. In fact, Life Sciences & Healthcare is an industry which normally does have good data but it’s generally still not quite enough to plan something like an automated warehouse.”

The reason for this limited visibility is because customers often have many disparate systems. Some might have different systems for tracking stock, temperatures, compliance with regulatory approvals, and serial numbers. It is not uncommon for such systems not to be linked, a factor which is traditionally the biggest roadblock in the way of pharmaceutical customers being able to provide reliable, standardized data.

However, advances in digitalization promise to deliver significant improvements in the collection and usage of data.

The field of clinical trials provides a good example.

With the increasing use of wearable technology, mobile devices and today’s intelligent packing services that can track and trace shipments around the world, the clinical trials sector already has vast amounts of data at its fingertips. Advances in data analytics capability will help to exploit those data sets more meaningfully, for the benefit of logistics companies, clinicians, and most importantly, patients.
In comparison to some other parts of the LSH industry, clinical trials has had something of a head start in terms of a focus on data collection. Since it is crucial that the environment of a shipment is strictly controlled, clinical trials have had by necessity to capture data on factors such as temperature, humidity and vibration in order to avoid potential disruptions to the product’s quality (given the sensitive nature of these experimental products).

Currently, various technologies are used so that more ‘live’ information can be used for pro-active interventions to save a shipment if a major excursion occurs during shipping. This is enabled by the use of sensors to record information along the supply chain via various means such as Bluetooth, RFID and NFC. These sensors are connected using the Internet of Things (IoT) and the data collected on a cloud that enables faster data query and wider access.

However, with advances in data analytics meaning that data can be used much more effectively, logistics providers will be able to reduce the time they spend on validating temperature excursions. As the database grows for each shipping lane, Artificial Intelligence (AI) modules will be able to intervene to predict the optimal shipping media, failure rate probabilities, and what traditional steps can be taken to mitigate known risks specific to a lane or temperature profile.

For pharmaceutical and medical device companies, IoT technology is also being employed within the warehouse, alongside warehouse management systems. This is helping to provide data on the movements of people and vehicles, from which a motion profile can be created which identifies inefficiencies within the warehouse.

Working with one global pharmaceutical company, DHL has implemented an IoT application within the warehouse allowing asset utilisation to be tracked. Aside from helping to improve efficiency, data is aligned to each pallet in the warehouse, meaning that an end-to-end shipment profile can be established for the purposes of tracking and tracing.

Digitalization and the human factor
Digitalization and smarter collection and analysis of data also promises to improve the efficiency of back office activities for administration and support.

With LSH customers often relying on several disparate systems, many require an extensive back office operation. They might, for instance, use a Quality team which essentially checks temperature data and looks for excursions as products move around the network. However, without the system being integrated with other systems, there is no data-driven approach and human error can occur.

Jonathan Blamey, VP, Global Solutions Design CoE at DHL Supply Chain, says that this is a key element of the digitalization approach. “Traditionally, LSH companies have employed a whole series of processes that rely on people following standard operating procedures, rather than using a system to drive the process.”

Jonathan says that the back office activities of medical devices companies will also become more efficient with a data-driven approach: “In many cases medical devices stock is kept in hospitals but owned by the manufacturer. There is often little automated tracking of the product in the hospital. Sales reps might go in and move it from one hospital to another with no record kept of the movement. Or a hospital may damage a device and the manufacturer may have to be prepared to accept a certain amount of loss. However, without data recording the whereabouts of the device being linked into systems, it’s currently a back office activity to try and manage where all the stock is.”

New technologies will also play a role in reducing the amount of back office support required.

Emily Smith, Global Product Development PMO at DHL Supply Chain points to the growing use of robotic process automation (RPA) in business automation. Such robots – essentially pieces of computer code – are capable of carrying out some of the routine tasks that humans have been doing for decades on PCs. Emily says that such software robots can – for example – open an email, copy an invoice number, take that invoice number and open an order, all without the need for human intervention.

Digitalization will also play an important part when the Falsified Medicines Directive – requiring serial numbers on individual pharmaceutical packages within the EU – comes into effect in February 2019.

Jonathan Blamey explains: “Under the Directive we will need to manage serial numbers on returns. We will also have to ensure that packages with serial numbers that go out of the EU come off the database. Therefore if they’re counterfeited or parallel-traded back into the EU there will be a record. However, that currently requires direct operational time to scan those units or packs of medication.”

Such physical processes, if you enhance them with digital technologies can help you achieve a step change in warehouse inefficiencies, says Thorsten Roggenbuck, VP
Global Account Management for Life Sciences & Healthcare at DHL Supply Chain. “Through the leveraging of multiple data streams you can improve warehouse processes, applying new technologies such as collaborative robotics. Using a digital technology such as a robotics solution that can work alongside human means you can design the process differently and capture another level of efficiency since of course a robot can work 24/7.”

**From data…to visibility and resilience**

Supporting the delivery of a truly end-to-end supply chain is one of the key focus areas for the digitalized supply chain – and by doing so, improving its efficiency and agility.

Thorsten Roggenbuck says: “It’s about end-to-end visibility all the way through from the supplier, to the production location, to the distribution center and finally to the paying customer. And if you have end-to-end visibility, you are able to connect the different parties in the supply chain and add significant value. If you have a system with warehousing data and customer order profiles, which also connects to transport data from carriers, then you can anticipate much more easily any problems, and carry out proactive notifications or contingency planning. It gives you a predictive component.”

“So you might, for example, be able to calculate that next Tuesday there will be an anticipated demand for a customer in a certain geography. You can then proactively initiate a corresponding order or shipment much closer to the geography, and therefore prevent a stock out. You can also use the information to choose the most efficient transport mode.”

The new technologies associated with digitalization – in particular IoT and big data analytics – are enabling such visibility and increasingly being incorporated into today’s LHS supply chains.

One other extension of this visibility is the level of resilience that it can help deliver within a supply chain.

Building a resilient supply chain necessitates knowing where its weak points are. Such knowledge is provided by data – but it’s about integrating data beyond just shipment, transport, or warehouse information. It also requires the integration of data on elements such as the political climate, economic stability, or weather conditions.

Many pharmaceutical and medical device companies utilize DHL Resilience360 since for such companies with their often disparate, unlinked systems, there are very significant implications if their supply chain breaks down. That might be a revenue loss, a reputational loss, or it could be a contractual loss with heavy penalties.

Jonathan Blamey concludes: “Much of the risk faced by LSH companies in their supply chains comes back to their disparate, unconnected systems. After some of the political, economic and environmental shocks of recent years, building a resilient supply chain is more important than ever. At DHL Supply Chain, we are helping LSH customers to do that by making digitalization part of the way in which we do business. We want to ensure that, together with them, we are on the cutting edge of innovation and helping them take huge advances in medicine that result in better patient outcomes.”

**RESILIENCE360**

DHL Resilience360 was developed to give companies a better understanding of the risks faced by their own supply chain, and improve their ability to monitor and respond to potentially disruptive events as they happen.

Driven by data, it helps companies identify risk probabilities and enable near real-time tracking of incidents capable of disrupting their supply chains.