The digital transformation of logistics

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Abstract

Digital transformation of logistics has emerged into the lexicon of the industry but lacks definition and actionable tactics. This paper offers a definition of the term and creates a context for how investments in software and hardware solutions can be applied as a strategy toward a more interoperable logistics community. Tactics and implementation strategies are described along with examples of past, current and future digital transformation initiatives from different facets of logistics. Tactics and strategies are shared with the intent to better prepare organisations to take advantage of the next generation of artificial intelligence (AI) and machine learning (ML) that are evolving rapidly.

Keywords

INTRODUCTION

The Industrial Revolution focused on machine automation of laborious tasks, and human labour was replaced with machines that could scale productivity and create efficiencies to deliver goods at dramatically lower costs. That revolution spanned decades as the machines developed for one market were refined and adapted to other markets. Each iteration created new efficiencies and standardised components to make building the machines as efficient as operating them.

Much like the Industrial Revolution before it, today's digital revolution has already taken hold across several industries and is quickly overtaking freight and logistics. This process is often referred to as the digital transformation of freight. The phrase has an appealing lilt to it that inspires hope for a better tomorrow, but what is really encompassed in that broad phrase and, equally important, is not aligned? What can we learn from other markets that have progressed through digital transformation? We must have detailed practical discussions of digital transformation and figure out how it will affect companies in logistics that choose to focus energies and resources to emerge well positioned for a future of growth

after weathering the tumultuous tides of rapid and dramatic change.

WHAT IS DIGITAL TRANSFORMATION?

For years, there have been many phrases around technology evolutions introduced into the transportation sector. One such phrase is digitisation, which has been cited in articles and conversations for over a decade. Lora Cecere defined differences in digitisation and digitalisation and published several excellent articles in 2015 and 2016 accurately predicting an array of technology changes.[1] The term 'digitisation' gained momentum throughout the less-than-truckload (LTL) industry in 2018 by JOC's Bill Cassidy with his repeated application of the term in articles and conference panel discussions. As with many new concepts in logistics without clear definitions, there is a risk that strategies can be reduced to buzzwords. That usually occurs when a term is misunderstood and misapplied so often it is diluted. The term 'uberisation' is a recent example of a successful strategy that has been so broadly applied in the media, sales decks and investor pitches that it lacks impact. Lora Cerere also offered an excellent distinction of terms as she defined the differences between digitisation, digitalisation and digital transformation.[2] Her definition of digital transformation is 'The transformation of the atoms and electrons of the supply chain to define/deliver new outcomes'. She used it to suggest completely new business models. I would offer to narrow the focus to evolving digital transformation within the supply chain and complement her definition as disruptive digital transformation. To that end, this paper offers strategies with the fundamental understanding that digital transformation is a journey, not a single event nor a destination.

Years ago, electronic data interchange (EDI) communications were brought to market to expedite communications between trading partners with strict guidelines on the methods and formats in which data is shared. There are dozens of EDI protocols and standards that contain many varieties, but in general, they replaced a manual process of retyping information into different systems or scanning and interpreting documents through optional character recognition (OCR) processing. This was a significant leap forward for all parties, and many shippers and industry providers are under the false impression that EDI is digital, and therefore they have already invested in digitisation. This investment is worthwhile, but EDI still relies on batched communications and has almost no interoperability between business systems.

Another popular evolutionary step arrived in the transportation industry as optimisation. For years, it was the buzzword for the latest and best practices to applying technology to gain efficiency and cost savings; however, it had broad definitions on what was being optimised. Regardless, if it is mode optimisation, carton optimisation, optimising trailer loading, staging orders, picking, warehouse storage, line haul or route optimisation, they all employ technology to improve a task critical to a company's internal operations. These are all necessary and powerful tools, and all are stepping stones of digitisation and examples of point solutions.

Other terms and tactics that more recently came into the industry describe digital strategies on how to penetrate markets or interact with clients. Concepts such as e-tailing and omnichannel

distribution are important components of digitisation, each speaking to a strategic portion of the capabilities on the journey.

The most encompassing definition to capture the concept of digital transformation is *the constant evolution converting legacy business processes, enabling near-instant exchange of data across interoperable business systems that span business partners and platforms.*

There are a few key components to explore in depth with this statement:

- First, 'the constant evolution' systems and technology have a shelf life and need to be refreshed and upgraded; this does not end;
- Next, 'converting legacy business processes' refers not just to manual data entry but also to electronic silos of data;
- Next, 'near-instant exchange of data' relies on the expectation that batch processing is reduced or eliminated. Information must be exchanged instantly between speciality business systems to mine new efficiencies and create broad-reaching value;
- Finally, there is the 'interoperability of business systems' component. It is as vast in definition as it is in potential. Many of the strategies susch as optimisation and omnichannel are building blocks for digital transformation as subsystems.

There are dozens of systems in any company's supply chains and logistics operation that are impacted with information updates. Digital transformation allows that free flow of information and systems updates across applications. When that same level of interoperability is layered across business partners, the efficiency and effectiveness of digital transformation is truly realised.

Early adopters in digital transformation were passenger airlines, as expressed in an interview with Gene Bartholf, who has spent his career in digital pricing with airlines and hospitality then as a vice president of pricing for a top-five North American LTL carrier. Bartholf brought forth the following insights on that evolution.[3]

Digital transformation in the airline space started 50-plus years ago with the emergence of global distribution systems (GDS). The GDSs allowed for electronic communication with travel agencies such that pricing and inventory could be shared with a distributed sales force. In the 1990s and early 2000s, we saw the emergence of other third-party distribution. Online travel agencies (OTA), such as Priceline, Travelocity and Orbitz, were partially created by the airlines themselves as a means to sell distressed inventory. Many airlines became overly focused on this distribution channel as a means to sell to price-conscious customers and fill unused capacity. This, however, fed the expansion (and thus reliance) on these OTAs, and a transfer of pricing power and demand from other traditional means, which led to a reduction in airline margins. It also fuelled higher transparency across the competitive landscape to the end consumer, as prior to their emergence it was hard to see a wide competitive product set in a single collection.

In the 2000s, airlines began to wrest back control from the OTAs by limiting fees and instituting a more direct path to the end consumer. The airlines sought to transform their products and pricing to sell in smart, more customer-centric ways. The industry and consumers saw the unbundling (and rebundling) of product features and services and an attempt to match the complete product

(seat and ancillaries such as bags and entertainment) in a more granular way to better fit variances in the individual customer demand. A major obstacle to this vision was the GDSs themselves (aka existing digital distribution path). There was no standard format across the GDS, and in many cases, the existing format did not support rich data transfer at a required level to allow the airlines to personalise their product in the way they desired.

In 2012, new distribution capabilities (NDC) arose in an attempt to address this issue. NDC was meant to be an extensible markup language (XML) standard (aka communication protocol) that would replace existing digital communication and technology that was many decades old (1980s).[4] The desire was to allow airlines to know more about customers and be able offer a highly personalised product direct to customers with full pricing autonomy (dynamic pricing) and product differentiation. NDC has had its set of challenges, however, and it is still not in full adoption. There have been debates over standards and adoption in existing distribution channels is lower than desired. Therefore, this transformation is still underway in the airline space, but holds great promise for the airlines and travelling public. While there is still a way to go, the airlines have made enormous strides in moving away from more static (published) and/or one-size-fits-many pricing to dynamic pricing that is highly customer-centric at the point of sale.

HIERARCHY OF NEEDS FOR DIGITAL TRANSFORMATION

Just as Maslow prioritised the needs for humans, organisation can approach digital transformation in much the same

manner. The invitation, however, is to approach each process as a separate project, rather than attempting to convert the entire organisation and its processes at once. Each time a system or process is digitised, the next prioritised element becomes easier because some data is already accessible, and the infrastructure evolves and expands with each additional facet of the business. The structure outlined in this paper is designed to offer a roadmap to evaluate and execute a digital transformation path for your own organisation. Every company starts digital transformation from a different place with a different set of systems and priorities.

Data collection is the first and most critical step on the path to digital transformation. Information captured on a notepad or scanned document might be very complete but unusable beyond the originator. Data collection must be digitised and shareable through an easily consumable electronic method to add value throughout the logistics community. Consider that every data element holds value for different parts of operations, sales, support, finance, marketing, human resources, procurement, as well as partners, customers and vendors.

Integration of point solutions to enterprise platforms will be critical for digital transformation. Closed networks and limited capabilities to extract or share data easily create friction and necessitate human intervention of shared information to stakeholders.

Enterprise-wide data may be accomplished with a large monolithic system that serves as the base technology layer for most of a company's operations, but more likely, there is a collection of core and ancillary solutions. One strategy can be to tie systems together as specific needs arise. This is often resource-intensive for

a short amount of time and delivers very good, specific results, but only for the initial purpose intended. Modifications and expansions will require additional projects to create other point–to–point system integrations. This is both the natural and the most common reaction when needs are identified. If an organisation is willing, however, to take a step back from solving the immediate issue and consider a solution in the larger context of digital transformation, then another tactic may prove to be more effective.

The concept of a data warehouse, especially for those in logistics, holds the immediate application of a reporting tool that can make operations more informed and add value to customers. Those are benefits that can have immediate impact and value, but it may also serve as a cornerstone to an organisation's digital transformation initiative. With a well–defined and architected data warehouse in place, not only does it provide valuable reporting tools for internal and external stakeholders, but it also serves as a foundation on which to build interop–erability across business systems as well as to partners, vendors and customers.

Regardless, if an enterprise resource planning (ERP) system has a data access layer that allows simple, free-flowing data to be shared or an organisation has contracted to build a data warehouse, it will streamline the company's efforts to share critical data elements and expand (see Figure 1). Partner-level digital transformation that is focused on inter–operating with specific critical providers is vital to a company's operations.

Interoperability at a community level is the broader sphere that extends instant data sharing beyond initial direct partners into the community that supports their specific operations. The maritime industry offers great examples of organising data standards by an inter–national community in their Convention on Facilitation of International Maritime Traffic (FAL Convention) and the Maritime Single Window initiatives. Ships entering compliant ports are able to simultaneously share critical
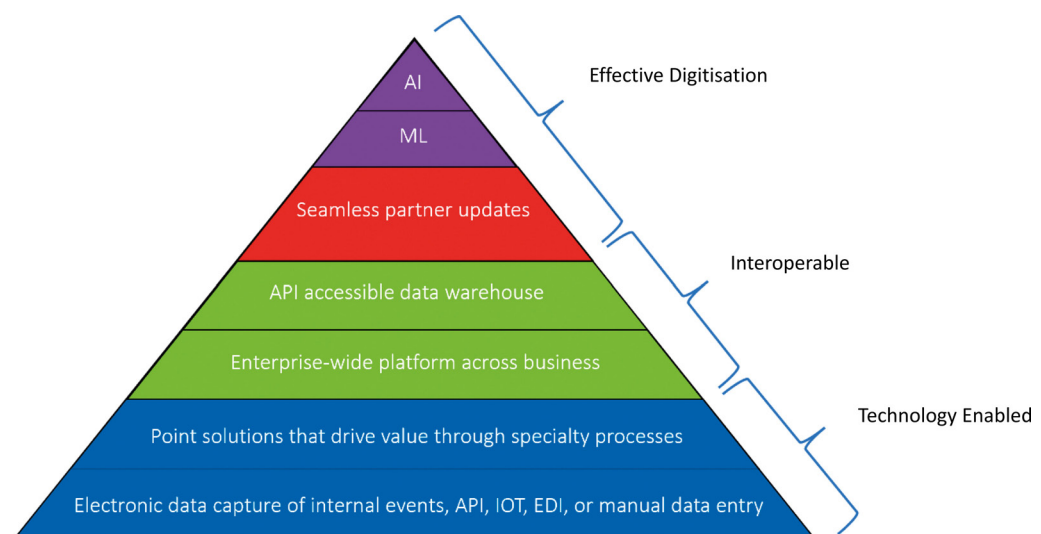

FIGURE 1 Hierarchy of digital transformation capabilities

information with the dock workers, equipment location and even the inland transportation via truck, intermodal or rail. The entire port operations community can begin to be orchestrated with digital standards and participation. The FAL Convention standards have been mandatory since April 2019, but the adoption is still rolling out. Yet, the initiative is a tremendous example of an industry coming together to drive digital transformation by setting standards as well as targeted timelines (see Figure 2).[5]

Maritime's advancements in standards are ahead of other facets of logistics, but in other aspects the maritime industry is lagging behind other modes of transportation in logistics in customer interactions, such as dynamic pricing that fluctuates with supply and demand. That, too, has begun in earnest with some steamship lines such as Maersk's spot rates and several third-party point solutions that are advancing the interoperability of legacy systems.[6]

Market digital transformation is the true seamless exchange of data and triggers action to different systems and relevant parties. Artificial intelligence (AI) and machine learning (ML) require an abundance of data to be effective, and as more companies achieve interoperability, the opportunity to apply AI/ML across several point solutions becomes a reality. While shown at the top of the pyramid in the graphic (see Figure 1), this is only to say it often has the most dependencies. As the industry and technology evolves, something will inevitably replace it.

The power of AI/ML extends through many facets of an organisation and business systems. The most publicised AI applications for the logistics industry are in self-driving trucks or warehouse robotics. Both will have great impact on the industry, but autonomous vehicles are leveraging the technology first to support their own point solutions. Warehouse robotics has quickly jumped
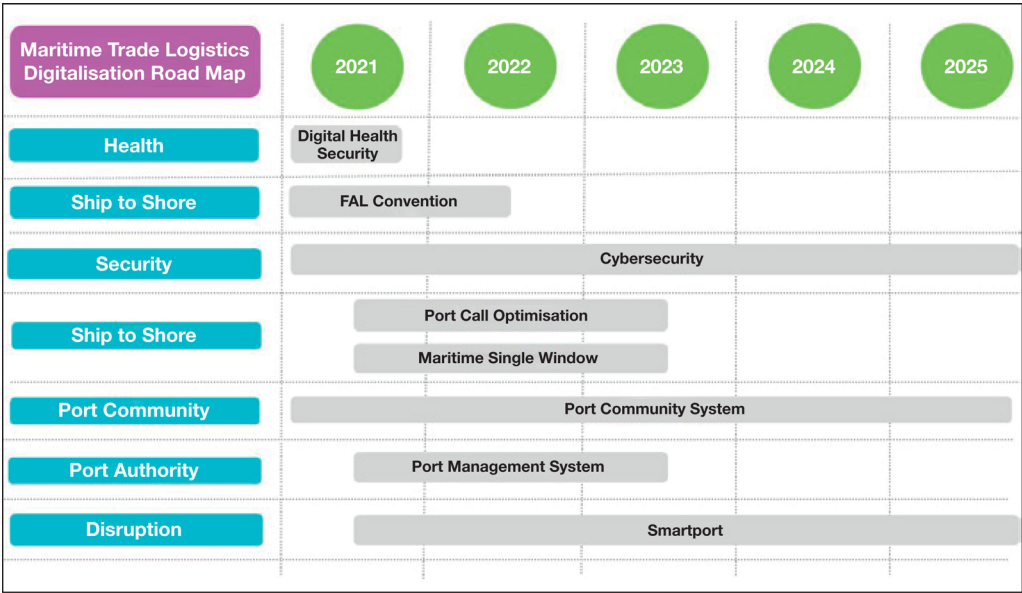

Maritime Trade Logistics Digitalisation Road Map	2021	2022	2023	2024	2025
Health	Digital Health Security				
Ship to Shore	FAL Convention				
Security	Cybersecurity				
Ship to Shore		Port Call Optimisation			
		Maritime Single Window			
Port Community	Port Community System				
Port Authority		Port Management System			
Disruption		Smartport			

FIGURE 2 Maritime trade logistics: Digitalisation road map
Source: The World Bank

to integrating with partner systems to automate store and warehouse replenishment. ML has permeated other aspects of our industry, such as final-mile delivery planning and line-haul planning for LTL carriers constantly learning from historical dwell times and updating scheduling and arrival times. The more complex the problem and the higher number of variables, the more AI/ML can make an impact.

Logistics is primed for a significant technology shift for those that can be among the early adopters. I believe that the human acceptance of AI will drive a wave of proven human-assisted decisions as suggested or prescribed changes to the supply chain operations. When humans trust the process and the results, a trickle of unassisted AI will be adopted. Digital transformation is the path to enabling companies to take advantage of technology advances to analyse massively complex scenarios and use data and logic to suggest the highest best use of resources.

IMPACT OF DIGITAL TRANSFORMATION ON LTL FREIGHT PRICING

LTL freight pricing has an incredibly complex set of factors that include equipment availability, driver availability (as you might see in full truckload operations) along with safety records, hours of service considerations, certifications for drivers for hauling hazardous materials, weather and equipment needs for lift gates and temperature control. Additionally, there are line-haul and break-bulk points consolidations, dock labour availability, driver contracts to get them home every day, consolidation and processing and the dependencies on the performance of each pickup and delivery

point to be efficient and effective, which are nearly always out of their control. There are dozens of additional factors that are not listed, but each can make or break targeted service and cost metrics. Every day a new puzzle is dumped on the table with only hours to devise and execute the best possible plan to make a profit.

• *Digitising the inputs*: Migrating more customers to application programming interfaces (APIs) allows the carriers' and shippers' systems to communicate directly and exchange critical planning data in real time. Electronic bills of lading (e-BOLs) are great examples of carriers being notified of more complete data and the shippers receiving their tracking numbers electronically well in advance of the carrier's arrival. Rate-shopping APIs are prevalent among all major carriers;
• *Point systems integration*: Carriers are becoming increasingly sophisticated with their point-pricing solutions to replace static annual contracts with dynamic pricing that better fits their operational needs and actually reduces costs for shippers and third-party logistics (3PL) because assumptions and averages are replaced with data-driven decisions;
• *Enterprise-wide intelligence*: This allows for the incorporation of other knowledge bases as factors into pricing decisions. An example might include the operating ratio of a particular client, payment history, dock conditions at a particular address or historic dwell times, which all factor in alongside the more traditional considerations of costing and operations of the carrier's existing network;
• *Data warehouse*: All of these data elements can be pulled from existing

systems into a data warehouse so it can be leveraged to drive the goals and objectives of the carrier;

- *Partner updates*: With the operational intelligence, costing requirements, clients' behaviour and business objectives, all accessible adjustments to pricing can be communicated directly through the existing APIs extended from the carrier;
- *AI/ML*: There are simply too many factors for even the most adept analyst to process. Those same skilled analysts can define the business objectives based on their internal metrics and help build the logic and let AI and ML suggest adjustments, while the analysts can measure and refine rules and continue to make the systems smarter.

Large e-tailers have developed and deployed AI technology to allow pricing to vary by client based on demographics, behaviour, geography, returns, frequency, etc. Shipper of choice will evolve from a plaque on the wall to select clients that will enjoy measured financial incentives as more carriers are able to quantify these factors and effect them in real-time pricing. Shippers and 3PLs that engage with their carriers to understand target metrics not just on freight and shipment attributes, but on behavioural and location conditions will have the competitive advantage because their pricing will reflect the operational effectiveness.

Gene Bartholf recognises similarities to the journey of the airlines. Parallels can be drawn and lessons learned from the airlines' digital transformation journey:[7]

- First, the North American freight-classification-based model needs an overhaul. Especially when carriers set pricing reliant on accessorial charges incorporated by reference and freight all kinds (FAK), this blinds the true attributes of shipment and prevents carriers from accurately pricing for the actual services requested. This is a hindrance in LTL profitability and needs to be unbundled once the systems are in place to support the effort;
- Secondly, annualised pricing is not reflective of the market fluctuations. Carriers need to move to dynamic pricing that can support operational needs, profitability and corporate strategy. This will require a platform and a toolset to manage these changes efficiently. This may come from a third party, within their own operations or, like the airlines, from a trade group;
- Lastly, with the digital infrastructure in place, the carriers can focus on data, models and tools in pricing that help them to predict, project and measure future needs and react faster in a more customer-centric manner within pricing. Additionally, carriers can then develop customer segmentation and pricing optimisation capabilities to better set the initial pricing when perfect data does not exist even in a dynamic pricing setting.

Carriers, regardless of their modes or positions in the logistics industry, are encouraged to engage with their respective technology providers to find out what connections are already made to interoperate with other systems and services.

In this example, the impact on the profitability has not yet been measured as the tools and the adoption are still evolving, but solutions driven by vendors will permeate into all aspects of logistics in the next 3–5 years. Setting strategies for digital transformation will ensure that a company is well prepared

to embrace the next evolution of technology advancements and use it as a competitive advantage over those that did not prepare.

IMPLEMENTING A STRATEGY, NOT A PRODUCT

A mindset shift is to consider every piece of transaction data and event data as an asset that can be mined to form efficiencies within an organisation. Like gemstones, data is made valuable if it can be extracted and worked. Data and events that cannot be accessed are the digital equivalent of industrial waste. There is valuable information that can convert data to efficiencies for an organisation by eliminating manual steps and reports, speeding up processing, repurposing human intervention and replacing entire processes.

To companies that have been through ERP or systems transitions and upgrades, refactoring the technical systems to interoperate likely sounds daunting, if not impossible, but implementing digital transformation can be much less catastrophic than tearing out and replacing software systems already in place.

APIs are now widely adopted as a method to exchange data in near real time with a broad pool of IT professionals who know how to program and adopt the technology. This is not so cutting-edge that it is inaccessible. In fact, the promise of digital transformation relies heavily on a broad adoption that can span a wide range of applications, business systems and company technical capabilities.

Digital transformation can be similar to sustainability measures within a company. If a clear objective is defined by executive leadership that all new initiatives, partnerships and software licences must contain a consideration for digital transformation that outlines deliberate and explicit required documentation on how data will be accessible within the organisation, this can become a part of a culture of reducing digital industrial waste. A common example of digital industrial waste is information that is not accessible to the direct parties involved, including any manual re-entering of data, paper documents, one-off reports, phone calls and e-mails.

DEPLOYING THE STRATEGY

So much data is available from every transaction and event update that a company must challenge and look to individual point solutions to drive how to convert data into valuable information (see Figure 3).

- *Originating data sources*: Device sensors, Internet of Things (IoT), business system updates or manual data entry methods digitally and instantly feed data to point solutions;
- *Point solutions*: Tasked to execute specific functions that are directly related to the new data collected. The point solutions trigger updates to a larger enterprise system;
- *Enterprise systems*: Share data across to inform and trigger action to other facets within the organisation, as well as triggering data sharing to other point solutions and strategic partners;
- *Strategic partners*: Other supporting businesses or service partners in the supply chain receive data as new from an originating source;
- *Repeat* the process with a broadening circle of business functions and strategic partners, extending the digital transformation to a larger community.
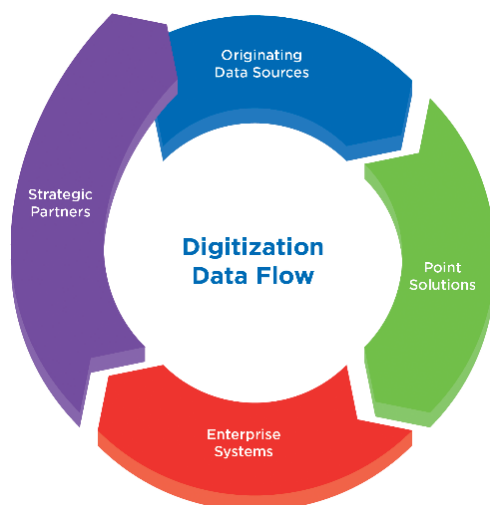
FIGURE 3 Digitisation date flow

transformation especially for their mission-critical roles in the industry.

Manufacturers and distributors tend to focus on digital transformation of their manufacturing production, order management and procurement as priorities. The efficiencies gained are the most impactful to their operations, and it is only natural that should be the initial focus. Similarly, the more advanced freight brokers have adopted web-based transport management systems (TMS) that connect instantly and directly to LTL service providers and load boards and integrate directly to their client's operations.

First step: Audit

Each company's journey starts where they are today with a review of what systems are not able to easily share data into or out of their system. One shocking element is often the realisation of just how many systems are in use and how differently they are used across an organisation.

Newer software, especially web-based applications, most often have APIs native to their architecture, and legacy on-premises systems should have an add-on or plug-in to enable data sharing through APIs.

If a business system is so outdated and the data siloed without opportunity to mine the data through interoperability, then a replacement should be considered. Another strategy is to invest in the development of an enterprise-wide data warehouse that enables a path for legacy systems to share data from their siloed applications.

Second step: Prioritise

Most companies in logistics have already begun a path toward digital

Third step: Expand the circle

A key component in digital transformation is driving that interoperability of systems in real time beyond the systems owned by a company. The data shared with vendors and partners can trigger events and additional processes to launch with zero human intervention.

This creates an audit trail event log. If the data is properly logged and accessible to other operations within a partner, it will trigger an expanding layer of concentric circle as data gets shared with secondary and tertiary processes and with other partners.

Geoff Muessig, the executive vice president/chief marketing officer for PITT OHIO, states:

'Each year, LTL carriers face rising costs in the areas of labour, equipment and tolls while shippers are tasked to contain freight costs. Digitising the complete life cycle of the LTL shipment – from quote to payment – provides both parties with the best opportunity to control costs. Many shippers already leverage API/EDI communication methods to obtain quote, shipment

tracking and billing information from their carriers. In 2021, there is a need for more shippers to digitally communicate accurate shipment notification, bill of lading, and payment information to their carriers.'[8]

Parcel carriers have excelled in the digital transformation of their own operations and extended that interoperability to their customers by expanding the process out to other partners that have an impact on their operations, such as payments and cargo insurance.

As partners receive data updates, those become their own sources of originating data and are used to trigger internal events from a point solution to other point solutions or update enterprise-level data. That may also trigger events to their partners or vendors. The cycle continues. As more companies share relevant data and drive digital transformation, the community advances and the path toward interoperability becomes simpler to execute within partners.

An example in the full truckload community is asset-based carriers that leverage onboard telematic systems that monitor many factors, including hours of service, engine hours, driver performance, as well as map routing features, which are all meaningful to the operation of that truck. Efficiencies are gained when traffic and weather alerts are integrated to deliver relevant information in real time. Add geofencing capabilities that can automatically notify a customer with updated estimated time of arrival (ETA) and imagine also getting dock assignments and appointment times ahead of arrival from the delivery destination. Communications with a valid electronic signature instantly notify parties of a successful delivery or exceptions, such as shortages or damage, not as an e-mail but as a system update, which then notifies relevant stakeholders and business systems to process invoicing normally or begin the exception process to file claims.

That same process can kick off in the receiving party's warehouse, which ripples through the dock labour scheduling door, equipment assignments, put away instructions and inventory updates. All of these capabilities and many more features already exist and are commercially available, largely as point solutions that are exceptionally good at components, which is why interoperability between systems is critical.

This is a great example of expanding the benefits of digital transformation of operations. As more systems and processes are added to automatically update, unforeseen efficiencies are often discovered that are not measured in keystroke savings but in fundamental process improvements or process eliminations, leading to competitive advantages in service or cost efficiencies. The interoperability across partners sets the table for AI/ML solutions that can manage complexities and nuances because there is more accessible data from which to evaluate and learn.

VENDOR LEAD CHANGE

Past technology evolutions were largely driven by large corporations to improve operating efficiencies at scale. These were primarily related to normalising communication standards between trading partners to automate existing processes more easily. Shifts like EDI standards and Voluntary Interindustry Commerce Standards (VICs) Bills of Lading (BOL) are excellent examples of a community coming together to promote technology efficiencies.

Digital transformation is likely going to appear as brush fires over the course of the next several years. Look for the primary drivers to be the point solution vendors that recognise the potential of improving their own offerings through partnerships. The lightning-fast speed of product innovation and development changes the focus from what an individual point solution can build to what can be delivered to the market as a faster and more mature combined solution than building an entire competitive solution from scratch. Speed to delivery with a mature quality solution is best accomplished through partnerships with other point solutions. Leading software vendors will take cues from their customers as great ideas and use that information to either build or partner to deliver powerful tailored solutions to the customer needs. For shippers, 3PLs and forwarders, there is such a diverse array of needs, based on the services provided and the market targeted, that no single enterprise application can support every scenario.

Some of the new web-native TMS solutions have broad offerings that focus their core value propositions on a specific mode but also support the ability to plug in other systems and solutions. These are platforms that allow the shippers and 3PLs to build on the point solutions needed for their success. Inherent interoperability is the real competitive advantage over heavy legacy systems that require a time-intensive and costly IT project whenever data is shared.

The next interesting development of interoperability will arise from refining data standards. Object-oriented architecture is much more flexible and forgiving than EDI formats. APIs will still benefit from setting standards on how to express data points like the recent Digital LTL Council's e-BOL data elements to further reduce the friction of sharing data between systems.

THE RISKS OF DIGITAL TRANSFORMATION

Cyber security is at the top of the list for the free flow of data between systems and partners. Multiple high-profile attacks across all sectors of logistics have been widely reported over the last few years. Between February and May 2020, cyberattacks increased 400 per cent in the maritime industry.[9] It is important to note that the majority of cyberattacks are not because of system-to-system interoperability, but the most common intrusions occur from outdated software patches, weak passwords and employee errors that invite malware into the system or network.[10] Those problems will continue, but digitisation works on exchanging data elements in secured system-to-system transactions that can be isolated and protected more effectively than an employee's e-mail box.[11] Cybercrime will continue to become more sophisticated and the diligence and investments into cyber security must keep pace.

DATA OWNERSHIP

There are many legal opinions yet to be challenged and defined. AI and data protection is left to national regulation versus a European Union (EU) standard.[12]

Similarly, in the US, there are significant legal questions yet to be answered around using the sources of data protecting the process versus the resultant data itself.[13] Until there are better definitions and concise rulings, this will remain uncharted territory. Companies advancing digitisation can

conform as more legal precedents are set, but in the near term, they will focus more on the impact of what data is shared and less on who owns it. In logistics, there are typically multiple parties in every transaction that each require significant data to complete their tasks and remain compliant with laws and regulations as a service is executed. Data ownership, as a concept, is difficult to define and enforce and will create significant friction to the benefits of digitisation if a party attempts to constrain use by claiming ownership and exclusive use of data.

A more practical approach is to set boundaries and limits of use or restrict identifying parties or critical proprietary data elements. Explicit agreements between point solutions and strategic partners can enable the free flow of digitisation while still protecting the respective companies.

SUMMARY OF BENEFITS

The journey of digitisation may be more aptly called a quest. Like all quests, it requires a higher purpose than the short-term win of a quarterly balance sheet and profit and loss statement. Real cost reductions are realised by eliminating redundant manual processes and replacing assumptions and averages with data-driven decisions. For now, unassisted AI may represent the holy grail of operational efficiencies and maximising profitability in ways that have not been previously possible. Digital transformation is the journey that delivers cost savings along the path and will keep an organisation well prepared for the future that demands data flow freely. When one quest is over, another will begin.

The benefits to customer interaction and new products or services that can be delivered will also provide competitive advantages along the way. Maintaining a digital transformation strategy can help companies avoid investing in systems that continue to silo data and generate digital waste within an organisation or between partners. It may also influence the path of the next partner or vendor if considerations are added to the request for proposal (RFP). An awareness of digital transformation will aid in prioritising projects and in viewing them critically as a spot fix to an acute issue or a long-term data accessibility solution. Companies that map a digital transformation plan will position themselves to lead well into the future.

CITED CONTRIBUTIONS FROM GENE BARTHOLF

Gene has worked as a pricing practitioner, pricing systems implementer and product director, and pricing consultant, and has led pricing engagements in airline and hospitality, manufacturing and distribution, until recently in the LTL space as vice president of pricing at YRCW (Yellow).

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