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Finance Automation The Future of Electronic Data Interchange (EDI)

Full report & survey results



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Finance Automation | The Future of Electronic Data Interchange (EDI)

EDI is **HERE TO STAY** and will continue to be augmented by **API TECHNOLOGY** to

improve onboarding time and increase Digital B2B commerce penetration. However, to reap these benefits a 'fix-the-basics' approach is required to scale effectively. A sound **MASTER DATA MANAGEMENT PLAN** will ensure system

inefficiencies are not magnified.

Joris Van Malderen Deloitte Consulting | Consumer Industry Leader

Glossary

Key terms are defined for ease of reference

Abbreviation	Phrase	Definition
API	Application Programming Interface	An API is a software intermediary that allows two applications to communicate. In the case of B2B transactions, this would be the transfer of information between ERP systems.
AS2	Applicability Statement 2	A file transfer protocol for secure transfer of structured data across the internet using digital certifiates and encryption.
B2B	Business to Business	Business to Business referes to the specific relationship between two (or more) business partners, as opposed to the realtionship between a business and its customers (B2C)
DBMS	Database Management System	A software technology used to store, manipulate and retrieve data whilst incorporating applicable security measures.
EDI	Electronic Data Interchange	Electronic Data Interchange is a form of communication between organisations by which messages which facillitate business transactions are exchanged. The messages have a specific format (e.g. EDIFACT) and a digital transmission channel (ex. AS2, Point to point, VAN)
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport	Also known as ISO 9735, is a standard EDI message format developed by the United Nations. Maintenance and development of the standard is performed by the UN Economic Commission for Europe.
FTPS	File Transfer Protocol Secure	A means of exchanging data via the internet, where messages are enrypted while it is being sent and decrypted on the receiving end.
IOT	Internet of Things	The Internet of Things refers to a world of products that are connected to a network, such as the Internet, a company intranet or a network using industrial communication protocols.
IPAAS	Integration Platform as a Service	Is a suite of cloud services enabling development, execution and governance of integration flows connecting any combination of on premises and cloud-based processes, services, applications and data within individual or across multiple organizations.(1)
MDM	Master Data Management	A method used to define and manage the critical data of an organization to provide, with data integration, a single point of reference.
OTC	Order to Cash	Are those business processes associated with the placement of ordes, shipment of products, invoicing, payment collection and processing of receipts.
PEPPOL	Pan-European Public Procurement On-Line	Is an international e-invoicing network, developed in 2008, that allows for the secure transfer of messages to companies and governements, worldwide.(2)
VAN	Value added Network	Is a secure file transfer protocol that is privately hosted and with structured messages being exchanged between fewer partners through a mail-box-like system

(1) Gartner; (2) Storecove

Our Approach

A combination of primary and secondary research was performed to develop an external point-of-view regarding the future of EDI



Primary Research

Interviews were conducted with key stakeholders at the client's OTC partners; Deloitte's FMCG clients as well as B2B technology vendors to better understand the current EDI landscape in terms of challenges and opportunities. We also investigated how they are planning to future proof their businesses with the adoption of leading-edge technologies.

A two-step interview process was conducted to generate insights quicker and facilitate deeper, more meaningful discussions with the interviewees.

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Secondary Research

Cross-referenced and interrogated insights from various research sources with our Deloitte Subject Matter Experts (SMEs). These sources included:



Interviewees complete an online questionnaire without a time constraint



discuss questionnaire results and probe for deeper insights







With this approach Deloitte has developed a **market relevant** and **future focussed point-of-view** that considers the **priorities of all players** within the digital commerce ecosystem.



Survey Participants

An integrated approach allowed for cross-referencing insights gained in multiple interviews



EDI – Still a dominant force (1/2)

EDI remains great at what it does: exchange high volume standardized messages between companies

Background to EDI

EDI has been around since the 1960s when it was established to facilitate message exchange between multiple computer systems. In the past decades, EDI has known widespread adoption throughout multiple industries (automotive, transportation, retail) because of its reliability and its capacity to automate manual B2B exchanges.

Although the exchange channels ('how') and message standards ('what') of EDI have changed throughout the decades, EDI remains great at what it is meant to do: exchange standardized messages between companies. EDI is capable of handling large transactions and has implicit security features which are vital to B2B transactions.

Today, **no viable alternative exists** which could rip-and-replace EDI. It is, and will remain the workhorse of B2B communication for the coming years.

WHAT is exchanged?

The information companies want to exchange is packaged using an agreed upon standard (ex. EDIFACT, ANSI X12). When packaged, the standard messages can be read by computer systems at both sides of the exchange enabling a completely digital interaction and eliminating the need for manual processes

- EDIFACT is the most used standard by European retailers
- In a few European countries, invoices have to be translated to a legal standard by using UBL (universal business language) to comply with regulation
- The increasing digitalization of companies is creating a need for more customizable message content which is in conflict with the highly standardized EDI message formats



HOW is it exchanged?

The packaged information is sent to the receiving party by using an agreed upon standard. The most frequently used standards in the retail sector are AS2 and VAN

- AS2 creates a secure connection between two computers by 'enveloping' the EDI data by using digital certificates and encryption
- VAN is a private network where EDI messages can be exchanged
- FTPS encrypts the message while in transit and decrypts it at arrival
- **PEPPOL** is a legal protocol for some message types which is mandatory in some European countries (3)
- Web EDI allows a manual input of messages in a web browser which are subsequently converted to an EDI format, then the message is sent by using AS2, FTPS.

(3) PEPPOL – Pan-European Public Procurement On-Line

EDI – Still a dominant force (2/2)

EDI will remain the workhorse of B2B interactions in the coming years

Why will EDI remain the workhorse of B2B interactions in the coming years?

- EDI is experienced as a reliable solution that solves the most critical B2B needs
- Once an EDI connection is established it works well. There is no viable alternative which works better in a way that it would justify uprooting the existing EDI connections with large partners
- Opportunities to digitalize B2B communication still exist in most companies and EDI remains the go-to solution in those areas where digital maturity is low
- 'Standardization, well understood, consistent across different business processes, reliability' (4)
- Retailers using EDI can integrate all business exchanges with their small suppliers through web EDI solving their 'long tail' issue. Web EDI does not require the lengthy onboarding process of 'regular' EDI and by using this tool an EDI penetration rate of >99% can be achieved for the retailer.
- Smaller customers will engage through web-based e-commerce sites. These link directly into the ERP system and do not require EDI messages.
- Large customers (e.g. retailers) account for the largest proportion of revenue and preferred established communication channels such as EDI. The cost of switching to alternative B2B communication methods would be very high for these large players.
- Medium customers (e.g. wholesalers) will transition to APIs as they have to interact with a number of partners and cannot lock into a single standardised format.

Why are alternatives to EDI being considered?

- The use of real-time data in decision making processes is rising and is enabled by IoT sensors throughout the supply chain.
 EDI does not support the capability to exchange this real-time information since it is based on an asynchronous data exchange in batch mode
- EDI has limited flexibility, making changes to messages difficult and it can be costly
- Onboarding remains a lengthy and costly process with minimum onboarding times ranging between 2-6 months.
- Increasing digitalization of most business processes (warehouse management systems, transportation management) requires an information exchange that is more customizable than EDI can currently provide.
- The legal obligation to exchange invoices through the PEPPOL network requires a new message format written using UBL
- EDI does not support advanced analytics capabilities

The EDI and API hybrid (1/2)

Although EDI has been successful in the past, it cannot continue to meet changing supply chain needs

Why APIs?

As mentioned previously, EDI is exceptionally efficient at allowing the transfer of standard B2B messages, such as purchase orders; delivery notes and invoices. However, the commerce landscape is changing rapidly, brought on by the "push" of digital disruption in the supply chain and the "pull" of ever-more demanding consumers wanting greater personalisation and faster delivery. These forces have prompted organisations to review their existing B2B commerce practices, and although EDI has a large number of other standard message types that may address some of these needs, the real challenge is addressing the quicker response time required, something that EDI is fundamentally not suited for. Enter APIs...

What is an API?

An API is a software intermediary that allows two applications to communicate (5) In the case of B2B transactions, this would be the transfer of information between ERP systems. API messaging is intended for more synchronous communication and may require a 3rd party such as an IPAAS provider to convert the API message into a format ready to be received by the ERP (e.g. IDOC in the case of a SAP ERP).

"55% of executives surveyed considered web-based APIs as an alternative to EDI as a result of the overall flexibility and increased efficiency in exchanging electronic documents."(6)

What impact will APIs have?

- APIs will reduce the on-boarding time required resulting in significant cost-savings and improved speed to market
- Error handling will be handled by the customer instead of your ogranisation. When an error is detected in a message from a partner, it is sent back to them to fix. This will reduce your operational FTE requirement but will increase the number of IT specialists required.
- The digital commerce penetration will increase by onboarding smaller partners through APIs, who cannot afford the infrastructure required for EDI communication
- More real-time data will allow for greater supply intelligence and a competitive edge in responding to abrupt market changes (volume, price movements)
- APIs may also open the possibility of new business channels based on selling access to the APIs themselves (7)

What are the barriers to API implementation?

- Requires all partners to implement system changes which impedes large scale adoption
- The message format is not standardised, requiring specialised mapping support though an IPAAS provider or EDI provider with this capability
- Unsecure and less compaitble with legacy systems
- API-led infrastructure is more dificult to maintain and scale than traditional EDI B2B processes (8)

The EDI and API hybrid (2/2)

A combined EDI and API B2B communication strategy addresses the shortfalls of both

There are two major benefits to integrating APIs into your existing EDI B2B commerce:



Real-time messaging

APIs allow customer's to log in and track the status of their order at any time, without requiring a batch type message at the end of the day. Supply-chain visibility is further improved by IoT devices which APIs allow for the relay of real-time information and rapid responses to supply-chain issues.



"APIs complement, rather than replace, traditional B2B technologies such as electronic data interchange and managed file transfer. Application leaders should use API capabilities to add new channels, enable automation and optimize their business ecosystem for digital business."

"By 2023, over 50% of B2B transactions will be performed through real-time APIs versus traditional approaches."(10)



In a survey of 200 supply chain executives, it was found that less than a quarter believed the future of B2B communication was EDI alone. With the majority indicating the rising impact of APIs, and that EDI will be augmented by these other B2B formats.(11)



Shifts in EDI ecosystem (1/2)

Three significant trends have been identified regarding the relative importance of ecosystem players and the choice between in-house vs. outsourced capabilities



Role of IPaaS increasing because of the rise in APIs. The cloud-based IPaaS allow for a better user interface and the integration of real-time data



Shift of the capability of B2B EDI multiplexers to in-house processing due to rising costs associated with the transaction pricing model.



Communication with smaller suppliers/customers organized through (web) portals so a full system to system integration is not required



Shifts in EDI ecosystem (1/2)

A deeper look into two of these shifts in the EDI Ecosystem revealed critical points for consideration



Outsourced or in-house B2B EDI integration?

IT supply chain leaders struggle to find the right decision-making criteria when making the choice between outsourced or in-house B2B EDI integration (12). Some of the criteria to be considered are:

Pricing model of software vendors

Due to the transaction price model of most software providers, outsourced EDI might be interesting for interacting with smaller clients who use different standards but expensive for those clients with a high transaction value. A shift in the pricing model structure of software vendors towards a price per connection rather than per transaction might alter the economics of the decision (13).

Standardization of formats

Due to the lack of standardization of formats, data mapping will become more complex and will therefore more likely be outsourced. Data mapping software (ex. Mulesoft, Dell BOOMI) can be used in a hybrid form with existingin-house B2B EDI integration models

Availability of talent

In-house teams require IT specialists who have skills that are in high demand in the market

Technologies used in the near future

The rise of API, and to a lesser extent blockchain, need to be contemplated when making investments in new B2B EDI integration solutions. The uncertain future tends to favor flexible solutions which are easily adaptable to future needs.



Need for a business roadmap for B2B communication

Conflicts can arise when touchless communication is implemented without inter-departmental oversight. For example, if EDI communication with clients is the norm the sales department might not be able to connect with the right clients because they do not have the required EDI capabilities and are therefore excluded from business.

Situations like these need to be avoided by defining a clear business wide B2B communication strategy. A lack of a business wide strategy will require more flexibility from the B2B EDI integration delivery model and might stand in the way of a fully touchless B2B communication



Emerging technologies

Blockchain would require significant changes to existing systems and is appropriate for specific use-cases

Blockchain integration

- Blockchain technology works best when it is used for data integrity issues. A complete replacement of EDI by blockchain technology is unlikely since data transfer on blockchain is heavy and slow.
- Blockchain will possibly see its uptake through multiple use cases (ex. connected supply chain, authenticity & provenance, targeted recall) (14). Conviction of management for blockchain solutions needs to be strong since ROI might not be felt for years
- A wait-and-see strategy might be appropriate for businesses who are not digital leaders as they can learn from competitors (e.g. Walmart and IBM food trust blockchain).
- Based on interviews with major retailers, blockchain is not on their immediate agenda. They are focusing on EDI process optimization: improving onboarding and error handling capabilities as well as API implementation for greater supply chain visibility.
- A B2B message exchange standard (EPCIS) exists which aims to increase visibility on the supply chain (15).
 Information on supply chain events as defined by the standard could be registered on a blockchain although it is not required.



Application of Blockchain in the Financial Services Industry (16)

- Although not yet released to the public, a major South African Bank has created a 'Digital Vault' to facilitate the exchange of crypto assets and connect to blockchain technologies
- Banking institutions have been slower to adopt blockchain technology since their primary focus is on information security and have to pass through a testing phase with a number of regulatory bodies before commercialising its offering. Network security has been a concern as the technology is still rapidly evolving and regulatory bodies struggle to keep pace.
- In 2020 there was significant institutional adoption, with the likes of Tesla, Harvard and Paypal all bringing Bitcoin onto their balance sheets
- The original intention of Bitcoin (which is just one form of cryptocurrency making use of blockchain technology) was to serve as store of value and as a defensive capital preservation asset.
- However, there is growing interest in the use of cryptocurrencies as a means of payment, and bringing the cryptocurrencies onto the company balance sheet is just the first step in enabling that future.
- The primary challenge at this stage is that companies wanting to make use of cryptocurrencies to facilitate payments will have to build additional technology layers onto their existing systems.
- Solutions, such as 'Lighting Network' are set to enable this payment system, but growing interest in this space will offer companies additional options in the near future as the usefulness of the blockchain network increases.



(14) Deloitte; (15) GS1; (16) Moneyweb

Spotlight: Master Data Management Process and Quality (1/3)

Active metadata management will have significant operational benefits as well as providing deeper customer insights



The need for MDM modernization

Master Data Management is no longer just a back-end process but is being increasingly used to help deliver business value across the customer journey (18):

- Provide customer knowledge identify gaps for cross and up sell opportunities
- Enable quote-to-cash processes governed product master data to keep up with the pace of new product introduction
- Inform pricing/discounting decisions based on customer lifetime value, current usage/adoption and past buying patterns across channels
- Holistic view of customer interactions provided to customer success teams to improve customer engagements

While still enabling critical back-office processes:

- Perform trusted financial and management reporting
- Provide a "clean room" facility
- Supporting complex regulatory policies
- Governed product master data to support product profitability reporting
- Provide a common template of master and reference data mappings

Spotlight: Master Data Management Process and Quality (2/3)

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A modern MDM system has a number of components, which can be combined with Cloud technologies to ensure speed and scalability

Components of a modern MDM system

- Visualization and Smart Search A highly configurable/ intuitive UI and input-based dynamic search capabilities help with managing customer hierarchies or complex product taxonomies.
- **Microservices Architecture** Allows for independent enhancement and scaling of functionality
- **Cloud/Hybrid Environment Enablement** provide interoperability across common cloud platforms in the value chain and on-premise applications
- Business and Governance Process Orchestration

 highly customizable workflows, voting/ranking/ chat features, mass maintenance, and machine learning-enabled guided workflows that recommend potential actions to users can greatly enhance productivity
- Machine Learning and AI reduces data management efforts and costs by constantly learning from, and emulating, the actions of a human data steward
- Richer/Deeper Relationships handle extremely high volumes on a Big Data platform to provide richer and deeper network relationship views
- **Digital Insights** understand the influences from new digital footprints across social media, blogs and ecommercesites

MDM and the Cloud

Combining Master Data Management with cloud and data lake strategies can drive a wide range of positive outcomes including the ability to:

- Understand customer needs and patterns in just seconds – Using a graph-based processing engine to match and relate data that delivers a more comprehensive view of customers and other business-critical entities
- Improve self-service empowerment Facilitating access to trustworthy data without reliance on IT
- Maximize extensibility to new data sources Creating custom metadata scanners for fast and easy access to custom data sources, such as legacy databases or bespoke applications
- Maximize extensibility to new applications Supporting a metadata repository for easy access to custom web portals, workflow-based systems, and reports
- Enable smarter data discovery Automating identification and classification of business entities
- Quickly achieve customer 360 view Reducing total cost of ownership by leveraging cloud capabilities
- **Provide automatic concurrency scaling** meeting fluctuating data volume and computing demands triggered by an increasing number of inbound/outbound interfaces that support various business processes

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Key considerations for MDM modernization (3/3)

In addition to ensuring that the MDM solution provides the advanced capabilities mentioned, a few points to consider during your modernization effort are:



Survey Results (1/4)

A summary of the insights gathered from the surveys conducted with European Retailers



Message Description	
ORDERS	Purchases Order/Sales Order
DESADV	Despatch Advice (Advance Shipping Note)
eINVOIC	Electronic Invoice
RECADV	Receipt Advice (POD)
PRIHDT/PRICAT	Price Catalogue (SD and/or price catalogue)
ORDRSP	Sales order confirmation/Acknowledge
INVRPT	Inventory Report
GENRAL/GENHDR	General Purpose Message (data, reports)
REMADV	Remittance Advice (partner, bank, in or out)
APERAK	Application and error acknowledgement
IFTMIN/IFTMBC/IFTMSTA	Transport management messages
ORDCHG	Purchase order/Sales Order Change (in/out)
DELFOR	Delivery Forecast (VMI/CMI)
Receipt Confirmation	Confirmation and/or VMI receipt
Invoice Overview (Summary)	Special Invoice Summary Report

Survey Results (2/4)

A summary of the insights gathered from the surveys conducted with European Retailers



 A lack of viable alternatives is not cited as a reason to continue EDI use – EDI has developed is highly efficient at the tasks that it performs



Survey Results (3/4)

A summary of the insights gathered from the surveys conducted with European Retailers



Key insights

- Cost of onboarding consistently biggest pain point – Lengthy testing times before establishment of an EDI connection remain. Retailers resort to using web based EDI to connect with their long tail as this process is not as onerous.
- The lack of advanced analytics is a common theme – Most retailers did not have clear EDI KPIs and only tracked yearly percentage of orders through EDI as their main performance metric. Although highlighted as a key issue, retailers did not have a view on what type of advanced analytics they would need (e.g. root cause analysis of EDI errors, data visualization). The only other example of a KPI being monitored was the time to transfer an order for which

a maximum of 1 hour is set and a duration of greater than 1.5 hours triggers a crisis event.

- Real-time information is a nice to have – For the type of messages exchanged, real-time information was not deemed required. APIs can enable real-time exchange for specific use cases.
- Integration issues Integration with a particular EDI message type, DESADV, which is equivalent to a goods receipt message, poses the biggest challenge. Messages may have the following incorrect details: quantities; reference numbers and/or package numbers. These occurrences will require costly manual intervention to resolve.



Survey Results (4/4)

A summary of the insights gathered from the surveys conducted with European Retailers

Less mature respondents see EDI spend as % of total increasing in coming three years while the most mature respondent sees a stagnation AS2 and VAN are the main channels used. Share of AS2 has increased in the past 5 years for all respondents

General Insights

Only 33% respondents indicate they use API while not one respondent is using alternative technologies such as blockchain, IoT or AI. Web EDI <25% of goods bought for all retailers and share has been increasing the past 5 years for the respondents that do not have a >99% EDI adoption rate

Key Insights

A summary of our insights

EDI remains the go-to solution

In regions with lower B2B digital maturity, EDI is still regarded as the go-to solution to reduce FTEs in the back-end. A client had 200 FTEs in the Accounts Payable department in 2010 and reduced it to just 5 FTEs today. Through this activity they saw significant cost savings.

APIs are picking up pace

The use of APIs is rising however, there is no standardization of message formats resulting in increasing implementation complexity and the rising importance of the role of integration platform providers.

Blockchain use cases are coming

EDI will not be replaced by blockchain technology since data transfer on a blockchain is heavy and slow. Blockchain is likely to see its uptake through very specific use cases such as track and trace.

The Future of EDI

EDI will continue to be the main form of B2B communication in the near future, with API augmentation addressing current challenges.

EDI Onboarding costly and lengthy

Based on interviews, respondents indicated EDI onboarding required a minimum of 2-4 months.

Key bottlenecks:

- Complexity (volume and number of types of messages)
- Testing backorder messages
- Familiarity of client with EDI processes
- Project management issues arising from challenges in integrating different gateways

Data Quality is key

Data quality is key to reducing on-boarding time and manual intervention required to fix failed EDI messages. Modernising the Master Data Management process will reduce data delivery time, improve back-end processes and deliver business value across the customer journey.

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Advanced analytics is on the radar

Survey participants deem EDI's lack of advanced analytics capabilities an important shortcoming.

Recommendations



Engage your current B2B service providers

Make sure you are partnering with service providers who have/are making the shift to API integration.

How can Deloitte Help?

Deloitte's experience in Leading-edge Advanced Analytics

Our Global Analytics practice delivers best in-class solutions, and we could quickly deliver actionable insights whilst negotiations with existing service providers is ongoing.



Implement a modern MDM system

Fix the basics by incorporating cloud technologies into your MDM strategy. This will allow your organisation to avoid costly mistakes as your digital B2B communication scales up.

Deloitte's MDM Elevate

An accelerator that augments Informatica's data management tools with Deloitte's industry leading practices and cognitive data management assets



Segment your B2B partners according to size and capability

Through segmentation of your B2B partner ecosystem, the most efficient and cost-effective communication channel may be identified: EDI, API or E-commerce portal.

Deloitte's data driven customer analytics

A framework to monitor the cost to serve of your B2B partner ecosystem, with the capability to dynamically determine the optimal communication channel based on changing conditions.



Develop a business case for in-house vs. outsourced management

Challenge your service providers' pricing model to shift toward a price per connection rather than transaction. Also consider the FTEs and capabilities required with an in-house operation.

Deloitte's Target Operating Model Design

A methodology based on the identification of the capabilities required to optimally in-source operations, underpinned by a business model to identify the financial tipping point.

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Full survey results and report available here k>

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