ADEPTIA

Reimagine Your Customer Data Integration

WHITE PAPER

About this Paper

Abstract

Customer Data Integration is built on old technologies that are falling short of handling the complexity of today. Whether a business uses EDI or APIs, neither of these technologies enable companies to exchange information without relying on expensive IT resources to first build connection protocols, which are difficult to scale and operate by non-technical users.

Trillions of dollars of B2B electronic interchange depends on technologies that are showing their age and ineptness faced with today's breadth and depth of the 4Vs of data — Volume, Variety, Velocity, and Veracity.

If you can re-imagine your CDI in such a way that new customer onboarding can happen like something Tony Stark might be able to accomplish in his lab — a world without waiting for IT data integration experts, then you could be the superhero your business has been waiting for. Let AI take care of the nasty details of data integration and give your customers and business users the tools they need to establish and grow business relationships.

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What is Customer Data Integration?

If customers sign paychecks, then happy and loyal customers enable business growth. In our current business and technology environment, the customer experience (CX) is paramount because customers can make more informed buying decisions and more easily and rapidly switch providers.

If disenchanted customers don't find the CX that they are expecting, they'll take their business elsewhere. And it is all too easy for them to let the world know about their old experience and their new one. Prospective customers have the easy and convenient power of crowd-sourced intelligence to help in vendor selection and can often experience you brand and services by proxy on the internet before you ever even knew they were engaging in a buying motion with your business.

As modern technology and Digital Transformation have accelerated the evolution of customer needs and decision-making, your business must address customer experience management and by extension, customer data integration. Customer data, synonymous with the customer itself, must be handled with the same precision and care as you would in handling your customers' physical assets.

In order to provide the best level of service possible to your customer, you must connect your customers' various data feeds with your digital business and overall data ecosystem. The robustness of this "connection" will serve as the foundation on which you can provide business value. Is the data within your connection the most up-to-date and reliable? Is it securely handled? Are responses using the data given in a fulfilling manner that exceeds expectations? How many automated and manual steps does the data need to jump through on its way to and from your business and your customers'? How difficult and time consuming is it to establish robust digital connections with your customers?

Customer data integration is the process of collecting and assimilating customer data from all interactions across all channels and outlets of a business and making it available as intelligence for the varied teams in your business so they can provide the best possible care and service. But it's a two-way street. That is, the data flows in both directions, of course, so all of the business people across the entire value-chain (regardless of enterprise boundaries) can benefit from the best information available in order to keep business in motion and grow revenues.

When done right, customer data integration can provide a holistic view of your customer's interactions with your business. This knowledge can be harnessed to create more effective business relationships and delightful experiences for customers. Your ability to delight customers is relative to the strength of your customer data integration.

Typical State of the Art in Customer Data Integration



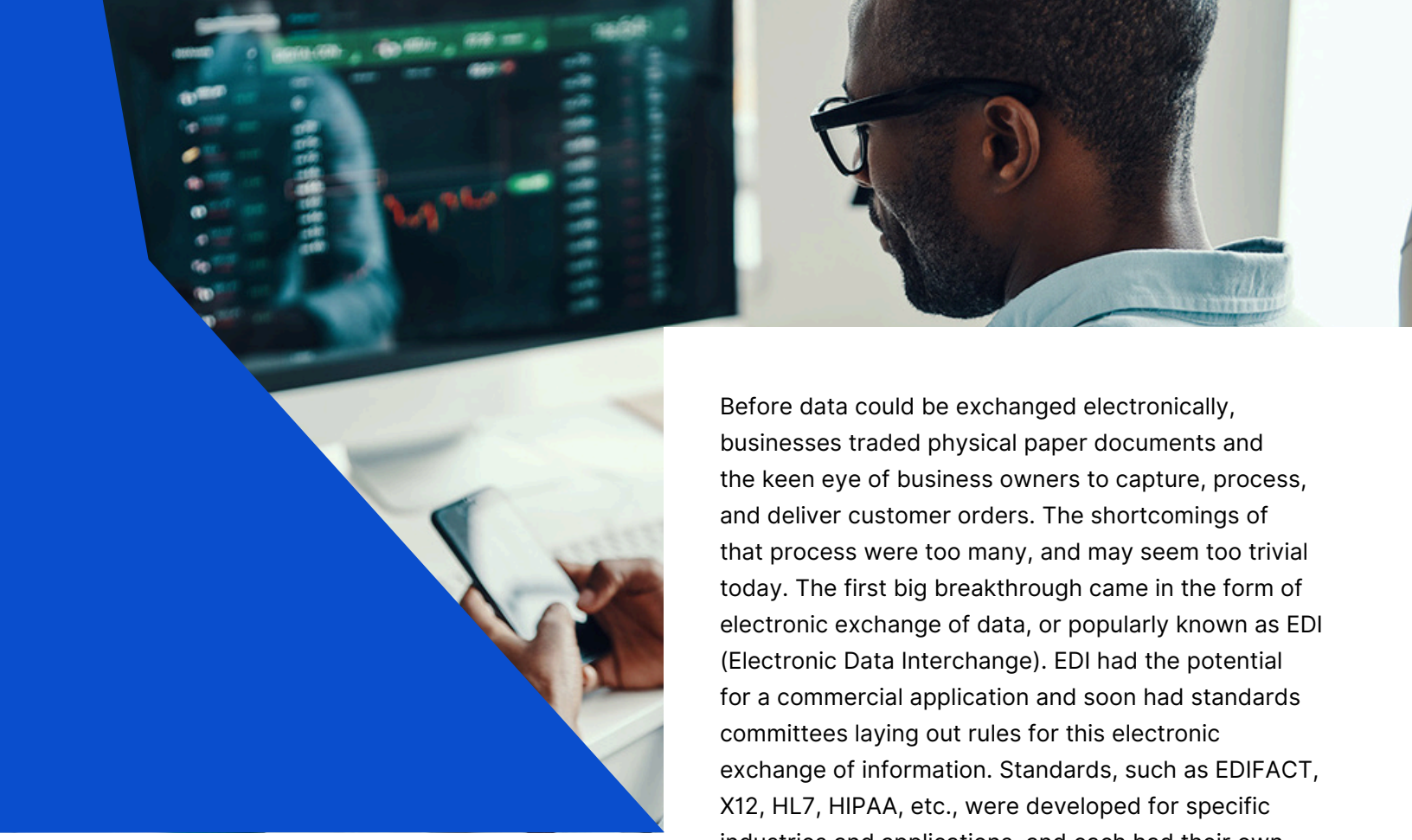
For most businesses, customer data integration limps along — far from the latest standards of data integration.

Many businesses either work with a manual integration strategy where people, not digitized processes, keep track of customer data across different channels and maintain that in spreadsheets or rudimentary databases.

These manually maintained databases often become difficult to manage and serve as a bottleneck for business growth. And they certainly limit the extent to which a delightful CX can happen.

Slightly more evolved businesses rely on their IT teams to develop EDI or API-based mechanisms for exchanging data between different channels and tracking them in somewhat more sophisticated databases. In B2B interactions, IT teams on both sides agree on EDI or API standards and begin data exchange, but they are soon challenged by the sheer volume of data exchange and become "locked-in" to the data exchange, and its lack of visibility to business people (for both you and your customer). They ultimately face hardships while expanding the nature of your business relationship on the fragility of the data exchange's architecture. Expanding in other areas of collaboration between you and your partners often reverts back to shared DropBox folders and spreadsheets until such time as highly skilled IT experts can productize the exchange into more instances of low-visibility traditional EDI or API- like exchanges. Agility suffers. Collaboration is low. Symptoms can also include degrading data quality and increasing skilled IT labor to correct data errors.

In any case, none of these approaches meet the demands of today's business needs to provide for the best CX. A select few businesses using the current generation of enhanced self-service integration technologies are reaping the benefits of delivering sublime customer experience and satisfaction, but more on that later. Let's first look at how integration strategies have evolved in sync with data communication technology evolution.



History of Customer Data Exchange

Before data could be exchanged electronically, all businesses had were paper records and the keen eye of business owners to capture, process, and deliver customer orders. The shortcomings of that process were too many, and may seem too trivial today

Before data could be exchanged electronically, businesses traded physical paper documents and the keen eye of business owners to capture, process, and deliver customer orders. The shortcomings of that process were too many, and may seem too trivial today. The first big breakthrough came in the form of electronic exchange of data, or popularly known as EDI (Electronic Data Interchange). EDI had the potential for a commercial application and soon had standards committees laying out rules for this electronic exchange of information. Standards, such as EDIFACT, X12, HL7, HIPAA, etc., were developed for specific industries and applications, and each had their own rules, formats, character sets, etc.

Fast forward to the 2000s, the EDI standards have proliferated into complex document exchanges typically between large trading hubs that are able to mandate compliance among their typically less-powerful trading partners (often suppliers). And over the past 10 years, APIs (over the internet) started making headway as an alternative to EDI. API, or Application Programming Interface, provides for greater agility and customization without as much lock-in to figuring out how to make the EDI standards accommodate more modern business data exchanges. Instead of relying on EDI document standards and rules, APIs used XML or JSON as response formats for communication. However, whatever technical debt you might avoid with less EDItech lock-in is doubled in terms of technical-debt as you try to keep up with API versioning that is often very specific to one trading relationship and more encompassing than just data formatting.

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History of Customer Data Exchange

Each of these methods for 'better' B2B data integration have their own set of drawbacks. For instance, the growing and myriad EDI standards and specifications made the technology hard to scale, turning into a complex motley of requirements that was too difficult to manage as businesses expanded their relationships. With each new trading partner, businesses had to employ expensive, high skilled IT to manage and grow the EDI support system. This was a barrier to scale and digital transformation.

With an XML based approach, the message sizes can grow unwieldy, become too complex and result with inefficiencies in processing a high volume of other small messages. When parsed in memory, they are resource-intensive and potentially disruptive to other B2B message traffic.

VANs, or Value-Added Networks, were another alternative to direct EDI connectivity. Essentially, VANs functioned as communication brokers in the middle, directing EDI messages between varied partner mailboxes. It was especially useful early on before many companies had constant internet connectivity and an ability to directly send and receive electronic documents. But this was long ago, when there were dial-up connections and phone-line modems. It was also useful when there were additional requirements that direct, peer-to-peer EDI couldn't tackle because of its nature, and that's why a connectivity broker in the center was needed. However, VANs generally were too expensive, especially for small businesses who did not have too many transactions flowing through. In most cases VANs also left a lot to be desired when it came to tracking and transaction status. And in cases where there were multiple VANs between you and any of your trading partners, you could just forget about document transfer status or visibility.

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History of Customer Data Exchange

Once Walmart and other major trading hubs supported and championed (read: “mandated”) the AS2 protocol for data transfer, it provided a means by which one might circumvent the traditional, expensive VANs. However, because of its reliance on internet protocols, even this method wasn’t the silver bullet small businesses needed. If anything, AS2 complicated things by imposing additional requirements, specialized software, and digital certificate management upon trading partners. IT to the rescue. But the cure wasn’t easy or inexpensive.

In short, all these technologies solve pieces of the puzzle but brought forth their own set of new problems and limitations. One set of limitations was replaced by another as mechanisms, standards, and implementation methods changed. And with each, a greater degree of IT involvement was needed to implement new trading partner connections. The resulting set of technologies involved in trading partner connections, data transfer, data reformatting, exception handling, data security, and so on evolved what was once a business person writing out a purchase order and mailing it to a supplier into a multi-layer technology masterpiece capable of processing thousands of orders per minute. But setting up, configuring, and servicing this beast for new customers is IT-intensive and extremely deficient from a CX point-of-view.

The key in understanding what would alleviate these headaches is considering all four dimensions of customer data integration. Instead of chasing some minor technical improvement or incremental gain in IT productivity by partially automating one of a hundred steps, perhaps it’s time to take a step back from the entirety of the process and technology and reassess the bigger picture.



Customer Data Exchange Evolves Into the Internet Age

With the advent of the www-era, the proliferation of apps and technologies increased. The presence and effects of technology as part of our lives have multiplied along with the challenges they accompany. The age of the internet was marked by an explosion in the number of connection points and devices getting online, and this wasn't limited to individuals.

More and more businesses started to digitize themselves, preparing for the future of information exchange. With this high-octane digitization of business processes, the volume of data being exchanged started skyrocketing. Each business was generating tons of data, and then sharing it via secure-internet transfer with partner businesses for daily transactions.

More people started to purchase and then bank online, and that sparked an increase in user expectations as apps and smart phones made certain tasks much simpler.



Gradually, there really was an app for just about everything, and customers expected to be delighted online and at every step of their interaction with a business. The 'Amazon ease' became a norm, and the customer experience benchmarks kept rising. Companies wondered why they couldn't incorporate this into their way of doing business.

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Even with this rise in business-user and customer expectations, large B2B companies were too far behind in revamping the way they exchanged data with businesses and customers. Most B2B giants were still using EDI for their transactions, with a handful still relying on shared spreadsheets and documents — a recipe for disaster.

Customer Data Exchange Evolves Into the Internet Age

With so many connecting points and virtually everyone in the world getting online and creating a data trail behind them, the complexity of data started ramping up more steeply. The problem was now multifold, customer expectations were higher and customer data was getting more complex with more information attributes being exchanged and tracked.

The 4Vs of data — Volume, Velocity, Variety, and Veracity — started growing in all directions, presenting more challenges for running business smoothly while still relying on old technologies. Data was getting more complex and voluminous, a far cry from simple EDI data from a few decades ago. As storage capacities increased, business was seeing the dawn of Big Data.

Complex data sets and variation in semantics made data mapping harder and more complex. While it was important to make sense of all that data, which was as precious an asset as any other, there was no solid way to make use of that data without first normalizing and preparing it. At this time, data had already evolved into an entity that needed special treatment, and not something that could be easily placed into an EDI template and sent to customers.

Large businesses, who were still stuck with the outdated technology of EDI, had a mammoth challenge in front of them. They had to deal with this high-volume data that was growing exponentially, had multiple versions, semantics, variety, and veracity.

Plus, they had to do all this without losing sight of their customers' needs and business-user expectations.



EDI vs API or Business vs IT?

Some old technology acronyms die off very slowly. (You can name your hourly rate as a COBOL programmer right now!) EDI is an example of this. Initially used in the early 1970s (long before disco), EDI became the de facto standard on how to exchange computer data along supply chains. Rather than have each business invent its own data layout for standard transactional business documents such as purchase orders and invoices, EDI standards bodies provided a format that accommodated most business relationships.

However, over the years, more and more things were added to the standards for each EDI document. There were numerous versions of the standards and not everyone could change their EDI maps that quickly, so large businesses quickly found that various segments of their supply chain were stuck on older standards of EDI. With the shear growth of all the optional fields and structures in just about any given EDI document — loaded with all the fields, repeating loop structures, hierarchical levels, and so forth to support just about every possible business relationship on a purchase order document, the overall full standard is not a very inviting experience for you, your customers, your trading partners, your business users, their business users, or really anyone — not even the well-seasoned EDI experts. One thing you can be sure of: there is no inventory planning, ERP, or other enterprise software, homegrown, bespoke, customized, or commercially available that natively accepts and stores EDI documents. Literally nobody uses the native EDI format for their own internal purposes. Everyone who accepts EDI must map received EDI documents into some other format for use by their applications.

Everyone who sends EDI must map existing data from their applications and databases into an EDI format for subsequent sending. It's a challenging format that only exists as an intermediary format between businesses. In every instance of an EDI document, there is upstream source data (from the sender) and downstream destination data (at the receiver) and neither of those formats is EDI. EDI persists only as the intermediary format in the middle and almost always between two business entities.

Need another example of how well loved the EDI format is? Virtually every business that operates today beyond 150 employees has at least two separate internal applications that need to exchange data with each other. Larger businesses can have hundreds of such internal applications that exchange data with each other. Even with thousands of EDI document types available for use and available tools in use at all of these businesses (they're used to exchange data externally: B2B) it is a very rare circumstance to find where two internal business applications use an EDI format to exchange data.

Now, before you get mad at your EDI team, you should know that trillions of dollars of commerce are conducted by use of EDI every year. This old data standard represents nearly half of all present-day B2B transactions. So, if you're using EDI, you're in good company. Alas, to do EDI with your next new customer doesn't necessarily mean you'll leverage existing EDI maps, you'll write more maps. So, you'll just be doing more EDI.

Some smart technology experts have been touting APIs as a superior approach to B2B transacting. But if you thought EDI was old (1971), APIs are nearly a generation older (1951). They represent a more independent and business-specific approach to formatting and accessing data ungoverned by central EDI committees and published standards.

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EDI vs API or Business vs IT?

Fueled by the proliferation of secure internet exchange, information savvy businesses have formed the API economy whereby certain APIs form a business model whereby customers requesting certain information can subscribe to the use of a supplier's APIs to pay for the information, on-demand. Complex and customized information delivery value-chains that don't fit into defined and standard EDI documents and associated data transfer and access methods are better suited for implementation using APIs.

But if EDI requires specialized data integration skills to define, implement, and maintain, APIs are nearly an order of magnitude worse. For one, the mitigation of different data formats and layouts is often implemented directly in source code in the language of the initial implementer's choice. Whatever programming language was chosen, Murphy's law relegates you to having little to no such available skills on hand to upgrade that API transaction and data handling at a later time. The technical debt that you incur as you embody critical B2B information exchange into literal computer source code inclusive of access methods, security, workflows, data format mitigation, and so on, is far greater than a typical EDI technology stack which almost always has an architecture that carefully separates access, delivery, tracking, workflows, data formats, and so on.

There are pros and cons based on the task at hand regarding which to choose: EDI or APIs. Sadly, neither EDI nor APIs intrinsically enable a business user to implement a new B2B integration connection let alone empower a non-technical business or customer user. So, a debate of EDI versus API is the wrong debate for the current business environment where non-technical business and customer users need to be given tools to more quickly connect and conduct business.

Reimagining Customer Data I ntegration



To meet increasing customer expectations, consider your own increased expectations when conducting personal business. What used to be an involved process to get an auto or homeowners insurance quote, must now take place in a 15 minute session on a website and result in an immediate quote that lets you subsequently play what-if conditions with varying coverage and deductible parameters.

With your bank, you may have grown accustomed to the ease of depositing checks from your smartphone and an app published by your bank. This was something just a few years ago that you expected would require an in-person visit to your nearest bank branch. And when you get the idea for a new item that you'd like to purchase, you now have the expectation that the next time you sit down with any one of your devices, you'll be able to quickly find that item on Amazon and have it delivered to your door within a couple days. Speed, convenience, and ease define your expectations for getting things done. Does your company offer the same level of speed, convenience, and ease as your business customers interact with your front office? If not, someone else will.

Sure, the level of data integration between you and your corporate clients is much more intensive than your personal Amazon shopping cart. But if you have a team of onboarding professionals who still need to write data maps, manage customer-specific spreadsheets, and craft scripts and other artifacts (including code) using data integration tools, then it likely takes your company weeks, if not a few months to onboard new clients. This is not fast, convenient, or easy.

As the basis for reimagining, just consider what it could be like if your IT experts weren't on the critical path to implementing each new customer onboarding. What if customers and front-office business people could implement new data integration onboarding?

Self-service integration ensures that the people in your value-chain (with albeit limited technical competency) can look directly at data streams and customer entities through intuitive screens and dashboards and make data onboarding connections by only pointing and clicking through easy screens. It can be so simple that anyone can be a data integrator, enabling everyone in the organization to delight customers.

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Reimagining Customer Data Integration

At the same time, IT is freed up from day-to-day implementation but continues to serve in a high-level governance role, managing the integration environment while being freed from tedious and thankless API coding and EDI mapping. IT can focus on more strategic tasks instead of being bogged down with data feed integration tedium.

With technological advances in machine learning and security protocols, non-technical users can let artificial intelligence understand and define data semantics, and then make data connections following those data rules. Further, a single click is needed to retrieve, breakdown, and manage multi-dimensional, complex data and stream it in real time to execute modern day business transactions.

Business users also can process highly secure transactions between a protected ecosystem and their environment without worrying about breaches, only because the current generation of customer data integration takes care of that in the background.

Effectively, this more than takes care of all the 4 Vs of data and enables business users to make important business connections happen as quickly as they can be conceived.

Adeptia's self-service integration product provides a business application experience for your business users. It has been cited by numerous Adeptia customers as having sped customer data onboarding by as much as 80%.



Impetus For Change

This revolution in customer data integration did not happen overnight and did not happen because of a single factor. There were many aspects at play, but primarily, it was driven by customer expectations and supporting technological changes that went hand in hand with an unrelenting quest by Adeptia software engineers to remove as many keyboard strokes and mouse clicks as possible from the effort to onboard the next new customer.

Adeptia has found a number of companies that are several years into an expensive and all-encompassing in-house effort to build self-service data integration. As more and more layers of what is needed to fulfill that effort become known, user interface experience expectations get more challenging, and so on, these projects almost always overrun and seldom even reach a minimum viable release. When the Adeptia product demo is seen featuring the prospective customer's own data and the timeline of a month or so to get into production with the first self-service integration project, these companies are often culturally able to grasp the implications and move quickly to adopt.

As much as the fruits of this labor sound like an obvious step forward to be explored and evaluated, consider the degree of acceptance of the status quo at your business. If your business has a specific goal



for any one or more of these, then you may be able to leverage the business goal as a driver to get IT buy-in and business sponsorship for adopting self-service integration:

- Become easier to do business with,
- Speed customer data onboarding,
- Improve your customer experience,
- Accelerate revenue,
- Reduce the number of hand-offs between different teams for customer critical operations, and
- Improve your Net Promoter Score



As we enter the third decade of the 3rd millennium, although you might think that advances in technology and consequent resulting business expectations couldn't be much higher. However, as Moore's law continues, the rise will be nearly exponential, and naturally, this will lead to even further evolution in customer data integration.

How would you reimagine your customer data integration if you were not limited by the constraints of current multi-enterprise integration?

As trends have shown, for integration to really make a difference, it needs to grow beyond the traditional limitations of IT. True power lies in making integration more collaborative and decentralized, and not as a monolithic function of one department in an organization.

How Would You Reimagine Customer Data Integration?

The onus of customer data integration should ideally be passed on to non-technical business users who can have more control over data flows through easy to use dashboards that only require pointing and clicking. Technology should enable them so much that they don't need to know how the underlying data transformation works — that all should be driven by technology subliminally in the background. With just a few mouse clicks, and it should be done.



Future of Customer Data I ntegration

From what we can see right now, the future of customer data integration is pretty exciting. For one, the increasing capacity of artificial intelligence and machine learning to handle the myriad details of customer data integration means computer hardware and software are doing more, so you can focus on the big picture.

It will be the job of AI to figure out data semantics, data mappings, required data transformations, and finally, protocols and execution of data exchange. AI will manage the 4Vs of data and define an execution strategy accordingly, equipped with anomaly detection and corrective workflow. AI will see how to best transfer data on the basis of volume and velocity, define what kind of data transformation is needed, and implement data quality and reconciliation controls to take care of veracity. All business users will need to do is to dictate what business relationships their companies will engage in and with whom.

As a fan of sci-fi, it has been fun watching how closely life has been imitating art. We now carry around tablets that we can directly write on and smartphones (I'm still waiting to get beamed up). Many of us verbally interact with virtual personal assistants (VPAs), "Alexa, please turn on the front porch lights." And, while driving, "Hey Siri, call Allison." As these VPAs get smarter and more capable, their users will have an expectation that data trapped inside corporate data warehouses could be interrogated and interacted with through voice commands. Perhaps you might say, "Hey Adeptia, show me all orders over $1M from our tier one customers over the past six months."

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Future of Customer Data Integration

Or, think about the superhero, Tony Stark, in his lab, with floating projections of all customer data connections and movement of data between businesses presented in a multidimensional holographic view that fits in your palm.

Imagine real time data tracking across this holographic network, with instantaneous flashing-red error reporting that only requires a few waves of the hand on the holographic network to remedy and return to uninterrupted business flow. Advances in Virtual Reality (VR) wearable gear are bringing the cutting-edge factors of Iron Man's lab into your workplace in the coming years.

Instead of going to the bank, the bank will come to customers, powered by Virtual Reality interfaces, and all interactions and service delivery will take place digitally without the customer having to step outside their space. Or, when customers order something using the internet, logistics will be able to dive real-time into their warehouses, source and schedule delivery of the product to each customer, show them a view of their product in real time, its sourcing from any location in the world, and its travel right to the final delivery at their doorstep powered by virtual reality and AI interactions.

A few decades ago, no one had imagined that people would be able to control their house lighting ambience, music, and connected devices with small mobile gadgets that fit in their pocket. Bring this leap in technology to B2B business transactions, deliver power in the hands of your business users, and let AI do more and more of the work as you worry less about the technical details of information integration and plan the next big endeavor to delight your customers and gain a competitive edge.



Conclusion

Customer Data Integration is built on old technologies that are falling short of handling the complexity of today. Irrespective of whether a business uses EDI or APIs, neither of these technologies enable companies to exchange information without relying on expensive IT resources to first build connection protocols, which are difficult to scale and operate by non-technical users.

Trillions of dollars of B2B electronic interchange depends on technologies that are showing their age and ineptness faced with today's breadth and depth of the 4Vs of data — Volume, Variety, Velocity, and Veracity.

Coupled with the sharp increase in customer expectations, tools managing this data interchange are just not enough to enable your business users to deliver a delightful customer experience and make you easy to do business with.

Stepping back from all of this tech, if you tried to get back to the basics of what all the tech is attempting to accomplish and imagine how it would be done without computers at all, you'd be left with legions of people stuffing and opening envelopes. Of course, that wouldn't be ideal, but at least your business users wouldn't be waiting on scarce IT data integration experts to implement data feed changes. Perhaps in some cases it would be faster than waiting months to implement new customer relationships. Alas, it wouldn't scale very well. We're certainly not advocating the absence of computers in your reimagining exercise.

(Although, there is something therapeutic about the Office Space scene where they take the printer outside in the field for... well... one last field test.)

If you can re-imagine your CDI in such a way that new customer onboarding can happen like something Tony Stark might be able to accomplish in his lab — a world without waiting for IT data integration experts, then you could be the superhero your business has been waiting for. Let AI take care of the nasty details of data integration and give your customers and business users the tools they need to establish and grow business relationships.

Get the power of self-service integration and set your business free. Go ahead, reimagine your B2B customer data integration. ▲

Author



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Joe is responsible for marketing, business development, branding, strategic positioning, go-to-market strategy, and sales enablement marketing.

Previous to Adeptia, Joe served as Sr. VP of Marketing at Lansa where he led global marketing, analyst relations, and lead generation in support of the company's low-code software development platform. Joe previously led Marketing at Cleo including product management, lead generation, analyst relations, and branding. During Joe's 5 years of marketing leadership, Cleo grew revenues 5x.

Before joining Cleo, Joe served in numerous software executive leadership roles including Marketing at SmartSignal, Marketing at Infogix, and 10 years of roles of increasing responsibility at GE Global Exchange Services (now OpenText) including Product Management, Product Engineering, and e-Commerce Consulting.

Joe earned an MBA from the University of Maryland at College Park and a BS in Computer Science at Siena College in Loudonville, New York.



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