

Leveraging No-code Opportunities in **Data Pipelines**

REALIZING TACTICAL AND STRATEGIC BENEFITS OF A
MODERN NO-CODE DATA PLATFORM STRATEGY

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01

INTRODUCTION

In today's data-driven world, companies of all sizes and industries are facing an unprecedented need to harness the power of data to gain a competitive advantage. Traditional approaches to building and managing data pipelines to consolidate it can be costly, time-consuming, and require specialized technical skills.

Enter low-code and no-code (LCNC) data platforms – a new breed of tools that enable businesses to rapidly build and manage data pipelines without writing a single line of code.

In this whitepaper, we explore the tactical and strategic benefits of a modern LCNC data platform strategy, and how it can help businesses of all sizes to overcome common data pipeline challenges.



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THE NEED FOR NO-CODE DATA PLATFORMS

Today, enterprise data is distributed across applications and data stores on-premises and in the cloud. These data silos make it much harder to access and analyze data because it is not in a single location or the same format. Without data consolidated, it either needs to be merged manually or data pipelines must be coded by knowledgeable programmers to automate the process. Building the technology to create data pipelines across different data silos to support better and faster decisions is a primary focus of today's IT department.

LCNC strategies are helping to relieve the pressure on IT departments that are swamped with requests to code ETL processes and data pipelines, by simplifying the process. These technologies are also alleviating the business managers' pain points by eliminating manual processes and providing tools so they can build pipelines themselves. Solving the most acute data

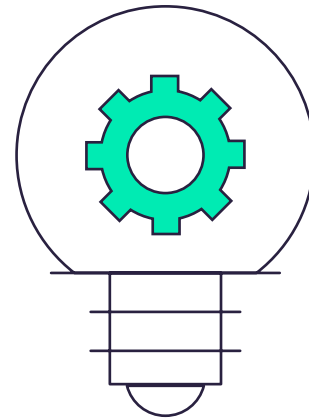
challenges can provide significant cost and time savings but extending LCNC data platforms further to enable and encourage all decision-makers across the organization to leverage their capabilities, presents opportunities to create long-term competitive advantages.

But scaling LCNC data platforms has its challenges and doing it right can avoid a lot of headaches. Governance, data observability, and citizen Integrators are all pivotal components of a successful strategy.

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TACTICAL BENEFITS OF A MODERN NO-CODE DATA PLATFORMS STRATEGY

The capability of low-code and no-code technology to reduce costs by eliminating demands on technically skilled workers has proved itself across multiple software domains. Eliminating coding requirements is driving tremendous efficiency and growth from application software development to cloud integration. As demand for data pipelines grows, low-code capabilities are creating significant efficiencies in this space as well.



Benefits of LCNC Across the Software Domain

The creation of the iPhone and the mobile app industry sparked explosive demand for application developers which quickly outpaced supply. Application development also became much more complicated with multiple operating systems, data connections, and unreliable power supply. Developers that understood how to design and code applications using Java, Javascript, or Objective C, were in high demand. As the industry began to mature, LCNC approaches began to emerge and restrain soaring costs. In 2014 one of the early successes, Outsystems, Inc., was launched. Today the company is now able to save its customers 24% on development costs and 7% on its ongoing support costs and provide a 26% increase in the benefits provided by a faster time to market. Line of business managers no longer need to

wait months or years for a swamped IT department to build an application, they can create it themselves with easy-to-use LCNC tools.

Low-code/no-code approaches are also seeing traction in the iPaaS market. Through the use of APIs, business users can integrate data sources in the cloud to share data between apps and create workflows through drag-and-drop interfaces. The emergence of RPA technology is another easy-to-use automation technology that is driving significant cost savings. This approach makes it easy for anyone to create a software-based robot that can emulate human actions. According to [McKinsey](#) RPA can bring a quick and robust ROI of 200% in the first year of deployment and 20%-25% cost savings.

In a data mesh, data is taken as a product owned and managed by a cross-functional team of data experts rather than a centralized IT department, data governance team, or data engineers. Consequently, data engineering teams can focus on implementing discoverable, explorable, secure, and reliable infrastructure that works across domains to make it easier for domain experts to create and manage their data products.

The No-Code Data Pipeline and Their Benefits

Much like the iPhone drove the demand for apps, cloud computing and the SaaS explosion of enterprise apps has led to a multitude of data silos. With one app for CRM and another for customer service or HR, merging this data to understand your business from end-to-end becomes extremely difficult. Specialized skills are required to build the pipelines that span these silos and support informed decision-making. As the demand for data driven analysis has grown over the past few years, the ability for IT to deliver on all requests is creating the same opportunity for LCNC platforms in the data management space as it did in other software domains. The benefits of LCNC or more specifically, no-code development are now making their way to the ETL and data pipeline markets producing considerable savings. In [Integrate.io's recent survey](#) of the cost benefits delivered by our platform, it was found that, on average,

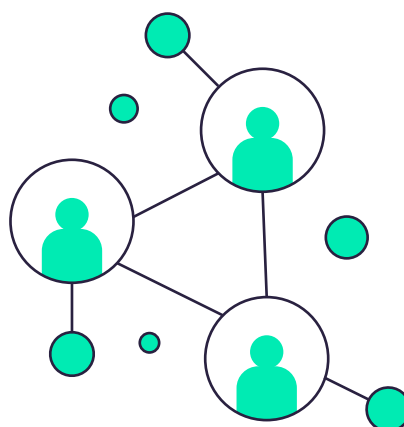
users saved \$187,000, were 2.7 times more productive, and saved an average of 44 hours of labor.

Much like with application software, the emergence of no-code platforms to build data pipelines eliminates the need for users to know software languages such as Python, R, and SQL typically required when using home-built solutions or complex ETL packages. By moving away from these platforms, data users don't need to burden IT with endless requests to create data integrations to migrate data from one repository to another. This also reduces the tendency of business users to default to the traditional slow and error-prone process of merging data manually.

While business groups are using no-code data platforms within organizations to drive cost savings and efficiency, some are adopting the technology faster than others. The teams that are gaining the most traction today are data teams, RevOps teams, line of business teams, and marketing teams.

1 DATA TEAMS

Data teams use no-code platforms to improve their speed and output. These platforms enable data analysts with limited or no coding experience to access data stores without having to wait on more technically skilled colleagues to help. [Gallus Golf's](#) data team saved 100 hours of work using the Integrate.io data platform and [Common Lit](#) saved 22 days of engineering time.



2 REVOPS TEAMS

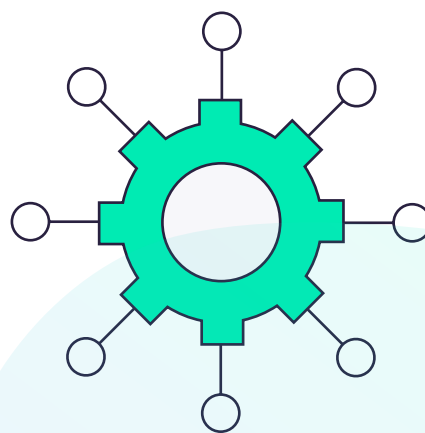
Revenue operations teams are able to get a better handle on what is driving new business. Instead of having to manually consolidate data from marketing, sales, and customer service data silos or asking IT to build a data pipeline, they can build these data sets themselves with the no-code data platform. [Penneo](#), an international SaaS platform was able to keep on top of their customer info with a 360-degree view without adding engineering costs.

3 LINE OF BUSINESS MANAGERS

Line of business managers must make informed decisions every day across all types of functions. Without consolidated data sets, these managers don't have all the available data to understand the full scope of their operation to make the best decisions. No-code data platforms help these managers create pipelines that consolidate data from a variety of sources, from CRM, HR, or ERP to support the best insights without the costs associated with complex tools. Buckner, an [industrial equipment](#) company was able to consolidate operational data to ensure teams had easy access to all the relevant info for a job.

4 MARKETING TEAMS

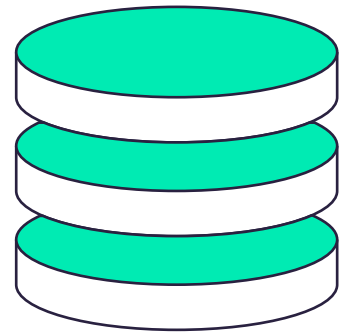
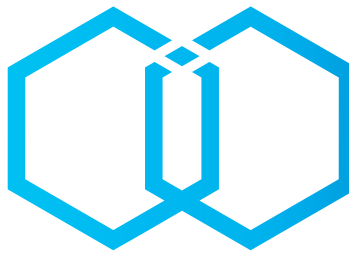
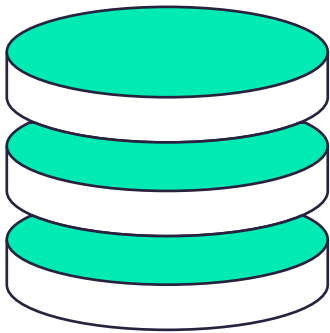
Marketing is a very data-intensive function. The more effectively a marketer can target prospects the more successful marketing efforts will be. Consolidated data sets that support more granular market segments lead to a better understanding of niche market trends, helping marketers be more successful in targeting them. No-code data pipelines are making this type of analysis much easier for marketing professionals. Creative Anvil, a [digital marketing](#) agency was able to consolidate their customers' data to provide more data-driven services.



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THE FUTURE AND THE MODERN DATA PLATFORM

Big data is not a new term, but the growing focus on data science, AI, and ML is leading to innovations around the deluge of global data and redefining what is achievable. The supply of data is growing exponentially, originating from an ever-expanding number of sources. Large data sets and the technologies that feed them, manage them, and transform them will only grow in demand and complexity. Modern platforms with the ability to effectively consolidate all this data into a single source of truth to run analysis and power AI models is required.

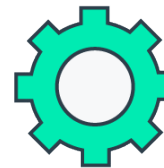


The modern ETL or data pipeline platform is emerging to fill this role. These platforms are not only about ease of use for non-programmers but as a one-stop shop for multiple approaches to managing large, centralized data sets. This includes:

- Extract transform and load (ETL) - the process of extracting and transforming data before loading it into a target data store.
- Extract load and transform (ELT) - the process of loading data into a target data store and then transforming it.
- Reverse ETL (rETL) - operationalizing data by transforming it and delivering it to end user applications.
- Change Data Capture (CDC) - Capturing changes in databases and replicating them to analytical data warehouses.



EXTRACT



TRANSFORM



LOAD

The ability to leverage these tools in a single platform with a single UI from a single vendor just simplifies the important data management function. Switching from one platform to another to conduct one task is not efficient. Standardizing on a single multifunction platform for building and managing data pipelines also reduces the tendency for workers to adopt individual SaaS solutions. This shadow IT limits opportunities for collaboration and creates compliance risks.

05

THE STRATEGIC LONG-TERM BENEFITS OF SCALING MODERN DATA PIPELINES

Building modern data stacks with LCNC platforms have a significant amount of immediate and quantifiable financial benefits, but democratized data access can also deliver qualitative benefits that can be much more impactful over the long term.

LCNC application platforms have been proving their worth for years by driving significant efficiencies in the enterprise through the streamlining and automation of business processes. They enabled workers to be more productive and enabled organizations to deliver better experiences to their clients and stakeholders in a much more tailored and customized way. While LCNC application platforms are great for tactical processes, data platforms are better at providing the fuel that answers complex questions, drives curiosity, and leads to innovation.

Insights that deliver better business performance are driven by curious professionals that are close to the business and its challenges providing them the knowledge to ask the right questions. As they find answers, new deeper questions are spawned that lead to more profound understanding. By providing the tools to support this type of exploration across the organization, new competitive advantages will emerge. Drag-and-drop tools that enable an analyst or engaged business manager to add a new dataset to enhance the existing consolidated databases to test hypotheses and consider new approaches are what drives new strategies. Tools that support this are a strategic imperative in an increasingly data-driven world.

Greater democratization of data through no-code data platforms and greater flexibility to create data pipelines for specific data analysis and exploration fuel strategic activities. With a single source of truth delivered through consolidated data repositories and data pipelines, business professionals can get their questions answered. Whether it is understanding customer behavior across all touchpoints throughout your organization or understanding how the operations in one part of the business influence another, having a consolidated data set is paramount.

Not only do humans need data but machines also have an insatiable appetite for data that is fit for consumption. This means consolidated and standardized. By reducing friction for data scientists, they can build more datasets to train models to make AI smarter. Even though data scientists have technical skills, leveraging LCNC platforms can help streamline their processes and will drive faster innovation.

Retaining the best people is also a long-term competitive advantage. Data analysts or talented and scarce data scientists are typically high-thinking curious professionals. They don't like completing menial and tedious tasks of moving data manually. With NCLC these workers can now focus on the creative problem-solving required to support an organization's growth. Keeping these hard-to-replace workers happy and engaged is key to retaining them.

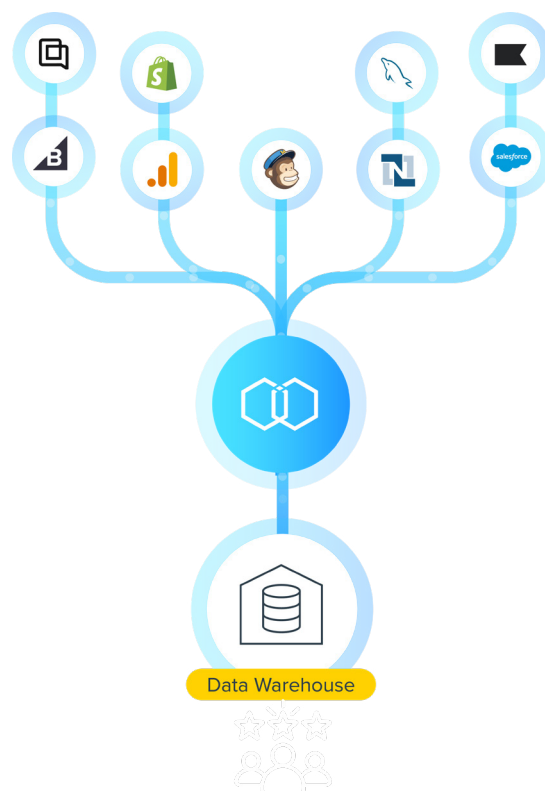
As organizations become more data-first and data-driven, the ability to build complex data pipelines and create datasets for optimal decision-making needs to be extended beyond just a few individuals and departments. Everyone needs this capability. But scaling this strategy comes with some risk.

Data Mesh vs. Data Warehouses

Data warehouses are centralized systems that store structured data extracted from various sources and transformed for analysis. Data mesh architectures are more decentralized and do not necessarily require data to be structured or transformed in a specific way before its usage.

Whether we talk about data lakes or warehouses, there are several problems that all centralized systems have in common. Firstly, with a central data engineering team managing access, it can lead to high latency if more and more access requests start coming from the domain teams. Secondly, in a centralized system, pre-processing a data source is the responsibility of the engineering team. However, this requires much domain-specific knowledge, which a single data engineering team may have yet to have. Moreover, it isn't easy to highlight systems or processes that are the actual data producers in a centralized system. It is just one single team preparing and delivering a data set.

Basically, a data mesh moves towards a more democratized system where each domain team can manage its data. In comparison, a centralized repository is managed by a single data engineering team that handles all the access and delivery issues across the entire organization.



06

SCALING YOUR DATA STRATEGY

As your data pipelines get more complex, ensuring quality becomes much more important. There is a significant difference between a software application built using LCNC tools and a data pipeline. The quality and performance metrics are very different. First latency in a software application is an experience killer but less important for data pipelines. Waiting for a page to load in an application presents a horrible experience and is a key metric to track. In data pipelines, the speed of data is not as important as the quality. The second important difference is it is much harder to observe deficiencies in the quality of your data pipeline than it is to find problems with poorly running applications.

Consider Differences in Quality Metrics

When there is a bad experience caused by a problem with an application, the user knows it. In many cases, there may be technical issues with the app but if it does not affect the user experience and the user does not take notice, it may not be a relevant issue. If a data pipeline is not working correctly and delivering low-quality or erroneous data, the user may never know it and just continue to make decisions on bad information, creating a huge issue. The long-term effects of delivering bad data can be profound. When decision-makers work hard to reach sound business decisions every day only to find that the data, on which they base their conclusions, is wrong they lose trust in their data systems. This makes your organization less competitive as leaders are less likely to make data-based decisions in the future.

Data Integration Approaches

The ability for data pipelines built on ETL, ELT, and CDC processes to track each step to ensure data remains of the highest quality sets it apart from other approaches to data integration.

iPaaS platforms make it easy to integrate operational data from multiple SaaS platforms and cloud databases, but they do not have the capability to ensure data integrity. APIs don't provide the history and context around the data they deliver. There is no data lineage to track data sources and how it has been transformed before reaching a final destination. This is problematic as you can't trace problems to their origin to diagnose faulty data pipelines. APIs and iPaaS are much better for integrating operational data.

In some cases, RPA tools are used to move data from one place to another. These processes are easy to implement with no coding required, but this approach does not scale well. When multiple RPA processes are dependent on each other and one breaks it is very hard to understand how a system with no real design works and how to fix it without creating new problems. Without any organization and design, systems become unstable and unmanageable.

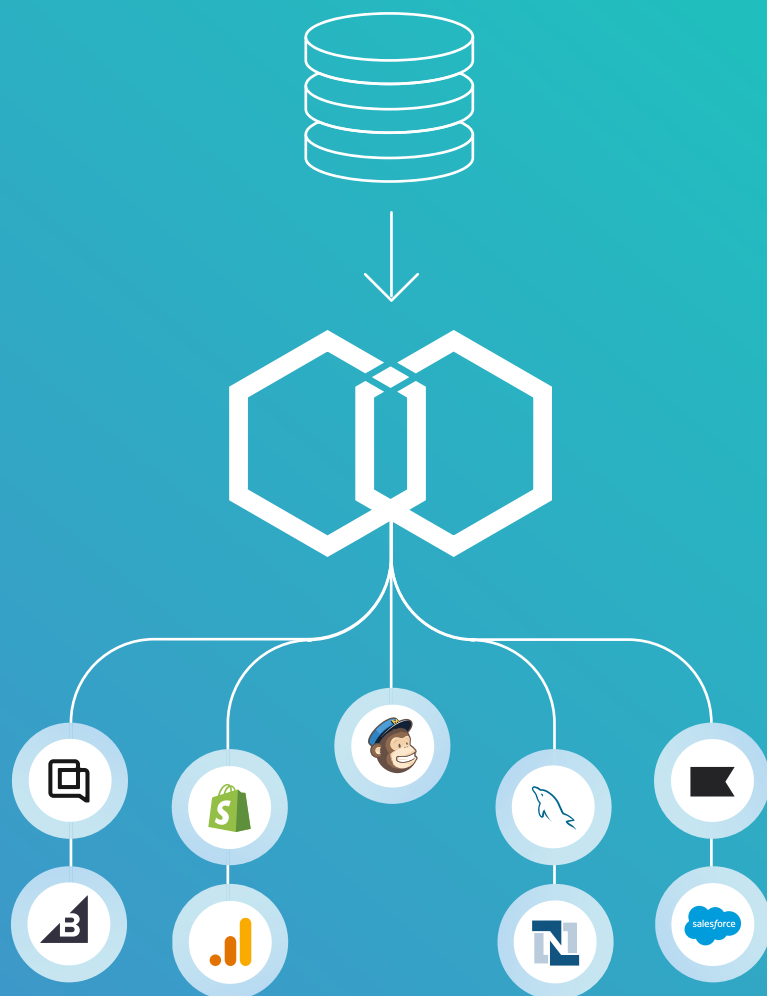
No matter what type of system you are scaling, having the appropriate governance and visibility ensures they can be effectively managed and maintained as they grow. This is particularly important when professionals without formal training in system design create data pipelines.

07

KEY COMPONENTS TO SCALE YOUR NO-CODE DATA PIPELINE

To scale data pipeline strategies to increase access to data and insights, data observability, governance, and citizen integrators are key.

- Data Observability & Quality
- Governance
- Citizen Integrators



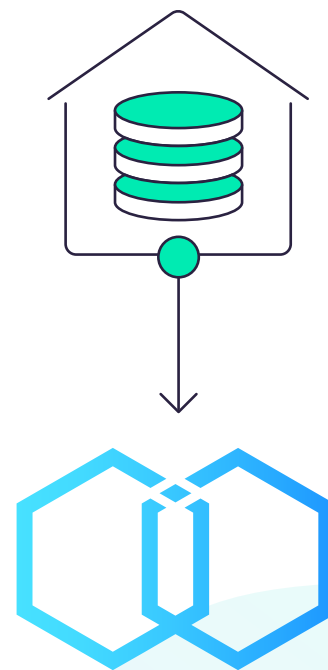
Data Observability & Quality

When data pipelines are not healthy, users may not know for a significant amount of time if ever. In this period, users are making decisions based on bad data, and once an error is realized, trust in the data and data pipeline is significantly eroded, making it very hard to restore confidence.

To avoid this, managers need to ensure that controls are in place to alert users there is an issue with the health of the pipeline. A number of alerts and metrics can be tracked to ensure data pipelines are operating correctly and delivering data of the highest quality and integrity.

DATA QUALITY

The quality of insights is directly related to the quality of data sets. The completeness of a data set is an important metric for data quality. Tables that have a high percentage of null values have incomplete data and are of lower quality. Being alerted when the share of missing data falls below a certain threshold is important for maintaining healthy pipelines. Tracking cardinality is another way to manage quality. Cardinality is the count of distinct elements in each column of a table. This can help you identify errors when cardinality is not what you expect. For example, if a column requires unique values but the cardinality is lower than the count of data points, there could be a duplication error.



VOLUME

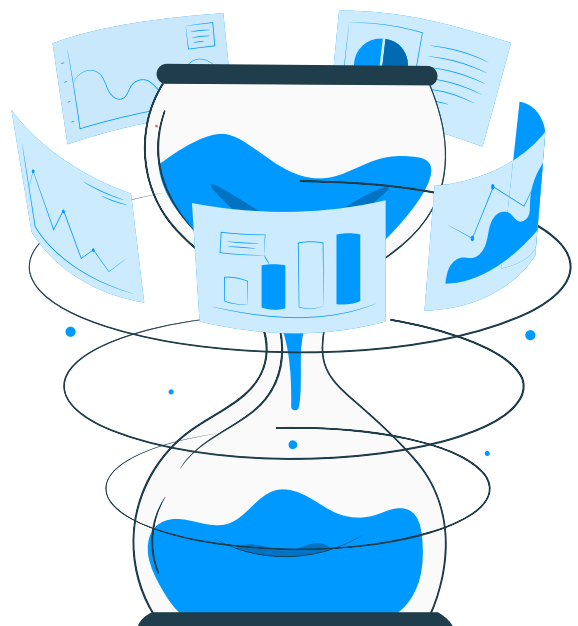
Data quality is very important but ensuring that you are not missing parts of your data set is also vital. For this, you need to track the volume of your data set. If the total number of rows in your table does not match what you expect, you may not have a complete data set, impacting your analysis. For example, if a table has 500,000 rows prior to being loaded into a database, and after the process is complete, it only has 50,000, data may have been lost. This is an important thing to know to ensure your pipeline is working properly.

CONSISTENCY

Tracking metrics and how they change over time can also help spot issues with your data pipeline. Tracking median, variance, min/max, and skewness can help you spot any inconsistencies caused by errors in your pipeline. For example, if there is a sudden and significant change in the mean of a set of values without any explanation, a problem with your data pipeline may have occurred. Geometric means can also be helpful in comparing consistency between data sets and help identify outliers.

FRESHNESS

It is important for decision-makers to understand how old data is and the newer the data, the higher the quality. When building data pipelines and analyzing results it is important to track freshness. Basing decisions on data that is no longer accurate or relevant is not recommended.



Governance

Governance is just as important to effective data pipelines as data observability is. Enabling non-technical professionals to build their own data pipelines can create an infinite number of opportunities, but this access comes with some risks. These professionals don't understand the best practices around data handling and security. To ensure that your LCNC data strategy does not create problems as it grows, you need to create governance policies.

Appropriate governance is often overlooked when an LCNC platform is implemented, leading to issues as systems grow. Governance policies should focus on a few key areas.

SECURITY

Policies that manage the delicate balance between data access and security are essential parts of your governance strategy. Defining who has the right to access what data and then managing this authorization as data moves through the pipeline is vital. Security becomes more important as more people have the power to access and transform data.

REGULATIONS

It is key for governance policies to take into consideration regulations and how they differ across vertical markets and regions. In the European Union, ensuring you have governance to enforce GDPR adherence is vital. Following HIPPA rules is another example in the US.

DATA INTEGRITY POLICIES

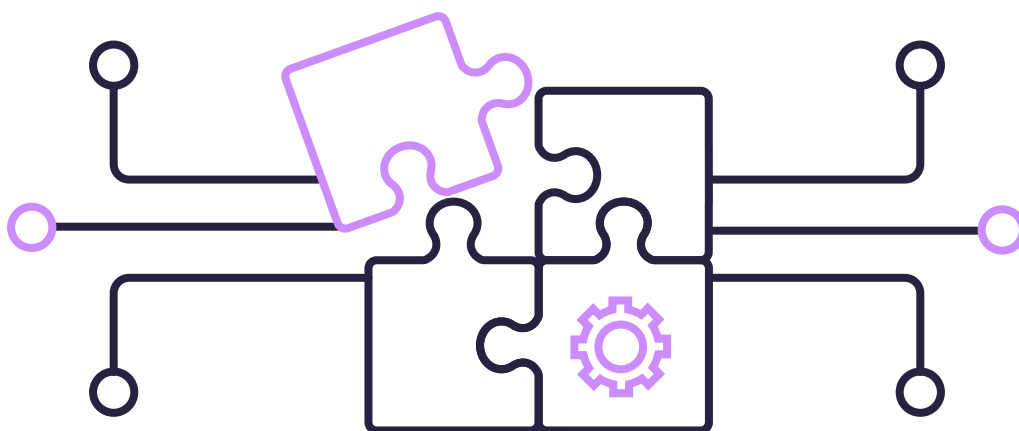
A good data observability strategy can help you identify issues with data integrity, but creating governance policies to avoid issues in the first place is also very important. Data users may not understand best practices for ensuring healthy data and pipelines. Policies around how data is gathered, stored, processed, and disposed of are important for any data governance strategy.

Citizen Integrators

Deploying an LCNC platform enables the role of the citizen integrator. The citizen integrator usually does not have coding or highly technical skills but has enough understanding of technology and data to become a power user of an LCNC platform. They may be line-of-business power users, business analysts, or data scientists. By centering your strategy on an LCNC platform and a citizen integrator, you have an individual with strong cross-domain expertise and command of a powerful toolset to most effectively create data pipelines outside the purview of IT.

Citizen integrators are also in the best position to ensure governance and work with IT or platform vendors to create new data connectors that can deliver greater value to the business. They also know the capability of various approaches to integration.

The citizen integrator can also be an important driver in scaling your no-code data strategy. Users that understand the power of the system and the skills to leverage it can increase the value of your investment exponentially. Selling the benefits of the platform to colleagues helps to scale your no-code data strategy and leads to new innovations. This could be as simple as helping to get new connectors built to support streamlining business processes.



08

BEST PRACTICES FOR ADOPTING A MODERN NO-CODE DATA PLATFORM STRATEGY

The benefits of democratizing information technology and software development have been well documented, and the demand for data is leading to greater democratization in the data management and integration space. Greater access to data and analytical tools will lead to much better decisions and long-term competitive advantages for those that can scale this strategy across their organization. Adopting these technologies in a deliberate way will maximize the value they can create while limiting the risk.

When considering how to implement these technologies and strategies, it is important that you build on a solid foundation that can scale. That includes balancing complexity with simplicity. Your platform needs to be powerful enough to scale across your organization to handle complex data transformations and high-volume data integrations yet simple enough for business people to use. It also has to connect to all your data sources, so a platform with an extensive connector library is key. As your data pipelines get more robust, you also need the visibility to monitor and manage them, requiring data observability.

The Integrate.io data pipeline platform provides the complexity to handle all your use cases yet the simplicity to support citizen integrators and business managers to build powerful, scalable data pipelines. To learn more about the capabilities of the platform, consider a [14-day free trial](#) to explore these capabilities.

We hope that you have enjoyed reading this whitepaper.

We hope that you have enjoyed reading this whitepaper. If so, be sure to [check out our other Whitepapers](#) related to "Leveraging No-code Opportunities in Data Pipelines".

Learn more about how Integrate.io can help
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