TIMEXTENDER

DATA-EMPOWERED CONSTRUCTION

Improve Performance, Reduce Waste, and Create More Value

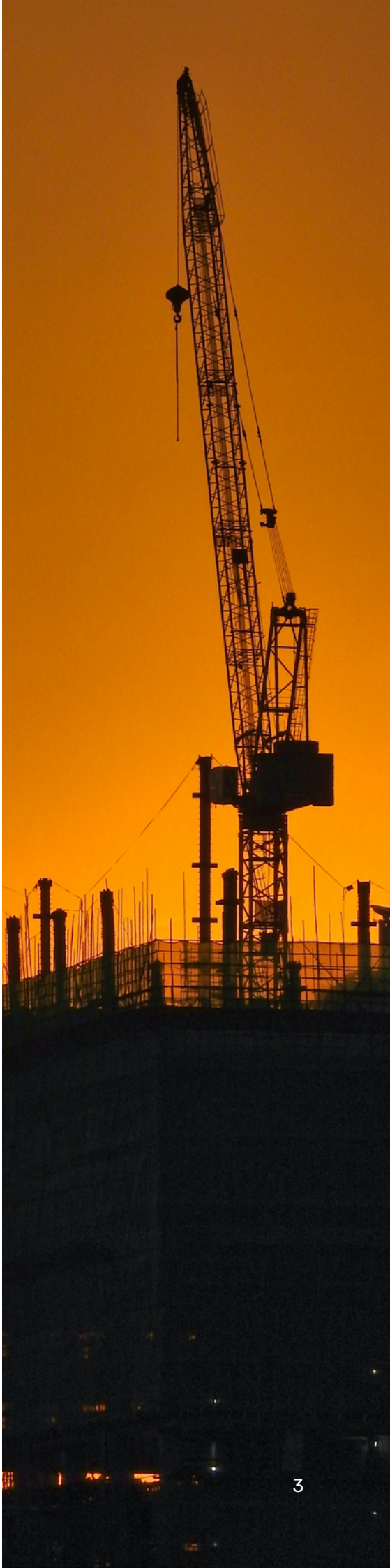
CONTENTS

IMPROVE PERFORMANCE, REDUCE WASTE, AND CREATE MORE VALUE

In today's construction industry, data analytics is essential for maximizing performance and staying ahead of the competition. By collecting and analyzing data on everything from construction costs and timelines to weather patterns and traffic conditions, construction companies can gain deep insights into each stage of the construction process.

With the recent explosion in data availability and the continued development of sophisticated analytical tools, construction firms are now able to access and analyze data like never before. This increased access to data and improved ability to analyze it has allowed construction companies to gain a much deeper understanding of their operations. In turn, this has allowed them to identify inefficiencies and develop strategies for addressing them.

The companies that embrace data analytics as a way to improve their operations are able to reap the benefits of reduced costs, improved project management, higher efficiency, and increased customer satisfaction. Unfortunately, data management challenges are threatening to derail construction companies' efforts to take full advantage of these new technologies. Construction firms must prepare how to collect, manage, and protect huge amounts of data in order to stay ahead.



HOW LEADING CONSTRUCTION FIRMS MAXIMIZE PERFORMANCE WITH DATA ANALYTICS

Over the last decade, the most successful organizations were the ones with the best data According to McKinsey Global Institute[1], data-empowered organizations are:

23x
MORE LIKELY TO ACQUIRE CUSTOMERS

6x
MORE LIKELY TO RETAIN CUSTOMERS

19x
MORE LIKELY TO BE PROFITABLE

Data-empowered organizations gained huge advantages over their competitors because they were able to quickly:

- ***Spot industry trends and new business opportunities***
- ***Anticipate customer needs and create better products***
- ***Optimize productivity, performance, and resource allocation***

Data analytics capabilities are now table stakes – the basic cost of doing business – regardless of your industry or company size.

EVERY COMPANY IS NOW A DATA COMPANY.

Now, we must all start preparing to use data in entirely new ways to power intelligent machines, automate manual tasks, and multiply our capacity to produce value for our customers.

6 WAYS CONSTRUCTION FIRMS CAN UTILIZE DATA ANALYTICS

Leading construction companies, such as Heijmans[2] and VolkerWessels[3] are using data analytics to improve their operations in the following ways:

1. COST ANALYSIS

As construction projects become increasingly complex, construction firms are turning to data analytics to improve cost analysis and control.

In the past, construction firms have relied on manual methods for analyzing costs. This often leads to errors and a lack of transparency. By using data analytics, construction firms can automate the cost-analysis process and get more accurate results.

Data analytics can be used to track construction costs in near real-time, allowing firms to identify and address problems as they arise. This prevents construction projects from going over budget and allows firms to save money.

2. PROJECT MANAGEMENT

Construction firms are under constant pressure to complete projects on time and on budget. Any delay can result in costly penalties, so construction companies are always looking for ways to optimize their processes and improve schedule efficiency.

Data analytics can help construction firms in a number of ways. First, data can help construction firms to better understand their past projects. By studying past projects, construction firms can identify patterns and trends that can help them to better estimate the time and resources required for future projects.

Data analytics can also help construction firms to improve communication and collaboration between project managers, engineers, and other team members. By sharing data and insights across the organization, construction firms can make more informed decisions about scheduling, staffing, and other project-related issues.

3. WEATHER & TRAFFIC ANALYSIS

By using data analytics, construction firms can now track weather and traffic conditions in near real-time. This information can be used to adjust construction schedules and reroute construction vehicles to avoid delays.

In the past, construction companies would often have to wait until after a project was completed to find out if weather or traffic conditions had caused delays. By understanding past weather patterns and trends, construction firms can now prepare for weather conditions in advance. This allows them to adjust their schedules and procedures to reduce the impact of bad weather on their projects.

Data analytics is also helping construction firms to avoid traffic disruptions. By analyzing traffic data, construction firms can plan their operations around areas with high or low traffic volumes. This helps to ensure that construction projects don't cause undue disruptions for local residents and businesses.

4. SAFETY

Construction firms face a unique set of challenges when it comes to safety. With so many moving parts and potential hazards, construction sites are constantly at risk for accidents. Data analytics can help construction firms improve safety by giving them the ability to identify and track potential risks.

First, data analytics can be used to identify patterns of accidents and injuries. By analyzing data on past accidents, construction firms can develop strategies to prevent similar accidents from happening in the future. Second, data analytics can be used to track safety compliance. By monitoring compliance with safety regulations, construction firms can ensure that their workers are following best practices. Finally, data analytics can be used to monitor equipment maintenance. By keeping track of maintenance schedules, construction firms can identify potential problems before they cause accidents.

5. WASTE REDUCTION & SUSTAINABILITY

Construction firms are under pressure to improve sustainability and reduce environmental impact. One way to do this is to use data analytics to improve resource management. By tracking construction materials and waste, construction firms can identify areas where they are using more resources than necessary.

In addition, data analytics can be used to track the environmental impact of construction projects. By monitoring emissions and energy use, construction firms can make informed decisions about how to reduce their environmental impact.

6. CUSTOMER SATISFACTION

Construction firms can use data analytics to improve customer satisfaction in a number of ways. First, construction firms can use data analytics to track customer satisfaction levels at each stage of the construction process. This data can then be used to identify areas where customers are most likely to be dissatisfied and make changes accordingly.

Second, construction firms can use data analytics to track customer feedback and address any concerns that are raised.

Finally, construction firms can use data analytics to create a database of satisfied customers that can be used for marketing purposes.

DATA MANAGEMENT CHALLENGES THAT THREATEN THE CONSTRUCTION INDUSTRY

Construction firms are excited about the potential of data analytics and are accelerating the implementation of these new technologies given the current competitive landscape. Unfortunately, data teams across all industries continue to face daunting challenges in the process of consolidating, preparing, and delivering reliable data to stakeholders.

The first step in this process is to extract data from a wide variety of sources (databases, CRM and ERP software, social media platforms, APIs, IoT devices, etc.). Once these data silos have been broken down, all that data must be consolidated into a central location, cleaned up, and prepared for analytics and AI/machine learning.

The 3 Components of a Modern Data Estate

This process of data consolidation, cleansing, transformation, and rationalization is typically accomplished using 3 primary components:

Data Lake

Where you ingest and store all your raw data. The data lake can be used by Data Scientists for advanced analytics purposes using AI and machine learning.

Data Warehouse

Used to store curated, cleansed, and transformed data for business analysis and intelligence purposes.

Data Marts/Products

Provides business experts with a subset of data based on their specific domain or use case (sales analysis, finance, etc.), without overwhelming them with a huge data warehouse that contains all reportable data.

*WE REFER TO THIS MODERN INFRASTRUCTURE AS THE **"DATA ESTATE"***

OBSTACLES TO BUILDING A MODERN DATA ESTATE

Unfortunately, there are significant obstacles that can grind the process of building a modern data estate to a halt:

Exploding data volumes: As we've already seen, organizations are experiencing an explosion in both the amount and the types of data that need to be collected, stored, and processed from a growing number of sources.

A backlog of requests: Line of business teams outnumber data teams, which leads to a never-ending backlog of analytics requests. A quarter of business experts[4] admit they have given up on getting an answer they needed because the data preparation and analysis took too long.

Talent shortages: This assumes you already have a large data team of highly-specialized professionals who can do all this work. Demand for data and analytics skills is outstripping supply[5], leaving many companies struggling to find talent.

Constant re-skilling: Data and analytics professionals are under constant pressure to spend what little free time they have on learning the latest technologies, tools, and methodologies so they can update their skills and preserve their market value.

Burnout: The data team is often forced to spend significant amounts of time on manual, repetitive data preparation tasks, which can lead to burnout and high turnover. 79% of data professionals[6] have considered leaving the industry entirely.

Data quality, security, and compliance: 95% of data professionals[4] report fears or concerns around controlling access to sensitive data, accidental data deletion, errors when analyzing data that lead to poor decision-making, security breaches, and regulatory compliance issues.

Communication barriers: Even with a strong data team in place, communication barriers between business experts and the data team often create additional bottlenecks and slowdowns. 34% of business experts[4] admit they are not confident in their ability to articulate their data questions or needs to the data team.

These issues can cause bottlenecks and frustration, inhibit growth, and do considerable damage to your entire organization.

YOUR OPTIONS: STACKS, PLATFORMS, OR BUILDERS

APPROACH 1: THE STACK

The process of ingesting, preparing, and delivering data for analysis has traditionally relied on a highly-complex stack of tools, a growing list of data sources and systems, and months spent hand-coding each piece together to form data "pipelines".

The problems with this approach:

Manual coding & pipeline creation: New pipelines must be manually built for each data source, data store, and use case (analytics reports, for example) in the organization, which often results in the creation of a massive network of fragile pipelines. Most data professionals report that they spend up to 50% of their time[4] solely on these types of manual, repetitive tasks.

Stacks on stacks of tools: To make things even more complicated, there is often a separate stack of tools for managing each stage of the pipeline, which multiplies the number of tools in use and creates additional silos of knowledge and specialization.

Vulnerable, rigid infrastructure: Building and maintaining these complex data infrastructures and pipelines is not only costly and time-consuming, it also introduces ongoing security vulnerabilities and governance issues, and makes it extremely difficult to adopt new technologies in the future.

Fragile pipelines: These data pipelines are hard to build, but very easy to break. More complexity means a higher chance that unexpected bugs and errors will disrupt processes, corrupt data, and fracture the entire pipeline.

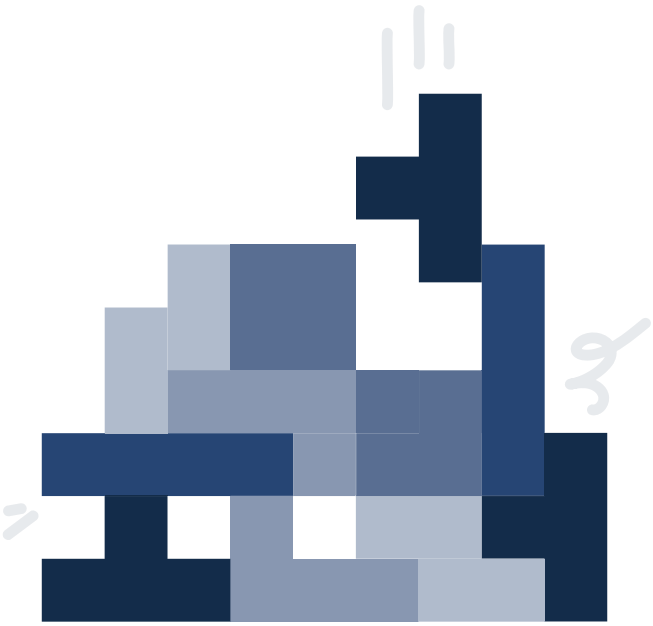
Manual documentation and debugging: Each time an error occurs, data engineers must take the time to go through the data lineage and track down the error. This is extremely difficult if the metadata documentation is incomplete or missing (which it often is).

No wonder 85% of these projects fail[7].

We know how slow, painful, and expensive this approach is from years of first-hand experience as IT consultants. We struggled through all these same issues when helping our clients build their data infrastructures.

APPROACH 2: THE PLATFORM

The data management market is now full of "platforms" that promise to reduce complexity by combining all your data storage, ingestion, preparation, and analysis tools into a single, unified, end-to-end solution. **While this might *sound* ideal, these claims start to fall apart upon closer inspection:**



Stacks in disguise: Most "platforms" are actually just stacks of tools that have been bundled together and sold under an unnecessarily complicated pricing model. The result is that you still need a large team of highly skilled data professionals that specialize in using each tool within the stack, and you're still dealing with high training costs and siloed knowledge within your organization.

Stitched together like Frankenstein's monster: Since it's a "platform", you'd expect a simple, clean user interface, right? Instead, you get chaos. Yes, all the tools have been bundled together and sold by the same vendor, but they're often collected through acquisitions, and it ends up just being a big, ugly mess of incompatible code that has been haphazardly stitched together into a "platform".

Low-code: Many of these platforms brag about being "low-code", but when you dig into the details, there are usually only 1 or 2 features that actually have this functionality.

Welcome to data management prison: Worst of all, you end up being locked into a proprietary ecosystem that won't allow you to truly own, store, or control your own data. All tools and processes are pre-defined by the platform developer, and then hidden in a "black box" that you can't access or modify. Many of these platforms even force you to migrate all your data to the cloud, and do not offer support for on-premises or hybrid approaches.

Trying to escape might cost you everything: Not only do these platforms significantly limit your data management options, but if you decide to migrate to a different data platform later, you must rebuild nearly everything from the ground up.

These solutions are not truly "platforms", and they don't really "unify" anything. They're just stacks with better branding and a lot more restrictions.

APPROACH 3: THE BUILDER

It's clear that these old approaches to data management simply cannot meet the needs of modern data teams. The rapid pace of the Machine Economy does not allow for the bottlenecks, slowdowns, and limitations these approaches bring.

Data professionals around the world are in desperate need of a faster, smarter, more flexible way to build and manage their data estates.

To meet the challenges of the Machine Economy, data professionals need a solution that meets all 3 of these criteria:

Low-Code: It must be smart enough to build your entire data estate for you by automatically generating all the underlying code and documentation, from end to end.

Agile: It must provide both technical and business users with a simple, drag-and-drop user interface for quickly ingesting, preparing, and delivering corporate data for analytics and AI/machine learning.

Integrated: It must seamlessly overlay your data storage infrastructure, with no vendor lock-in, while integrating all the data ingestion, preparation, quality, security, and governance capabilities you need into a simple, unified, metadata-driven solution.

		NEW APPROACH
STACK	**PLATFORM**	**BUILDER**
MANUAL CODING AND A STACK OF COMPLEX TOOLS	*RESTRICTIVE, COMPLEX STACK OF TOOLS IN DISGUISE*	*ONE LOW-CODE, AGILE & INTEGRATED SOLUTION*
		
Army Of Developers	Big Teams Still Required	Small Efficient Team
Many Complex Tools Fragile Pipelines Manual Documentation	Many Complex Tools Poorly Integrated Restriction & Lock-in	One Integrated Solution Drag-and-Drop Interface Flexible & Future-Proof
High Cost of Personnel, Training, and Tools	Complex Pricing Model No Transparency	70-80% Reduced Implementation Cost

MEET TIMEXTENDER,
THE LOW-CODE DATA ESTATE BUILDER

TimeXtender empowers you to **build a modern data estate 10x faster** by eliminating manual coding and complex tool stacks. With our low-code data estate builder, you can quickly integrate your siloed data into a data lake, model your data warehouse, and define data marts for multiple BI tools & endpoints – all within a simple, drag-and-drop user interface.

TimeXtender seamlessly overlays your data storage infrastructure, connects to any data source, and integrates all the powerful data preparation capabilities you need into a single, unified solution. Because all code and documentation are generated automatically, you can reduce build costs by 70%, free data teams from manual, repetitive tasks, and empower BI and analytics experts to easily create their own data products – no more bottlenecks. We do this for one simple reason:
BECAUSE TIME MATTERS

Goodbye, Data Management. Hello, Data Empowerment.

Data teams at top-performing organizations such as Komatsu[8], Colliers[9], and the Puerto Rican Government[10] are *already* taking this new approach by using TimeXtender[11], the low-code data estate builder.

By making the complex **simple**, and automating all that can be **automated**, our goal is to free up millions of human hours that can be used to **execute** on what matters most and change the world.

HOW TIMEXTENDER EMPOWERS EVERYONE ON YOUR TEAM:

Business leaders get fast access to reliable data, with 70% lower build costs and 80% lower maintenance costs.

Data teams get freedom from manual, repetitive tasks, and have more time to focus on higher-impact analytics projects.

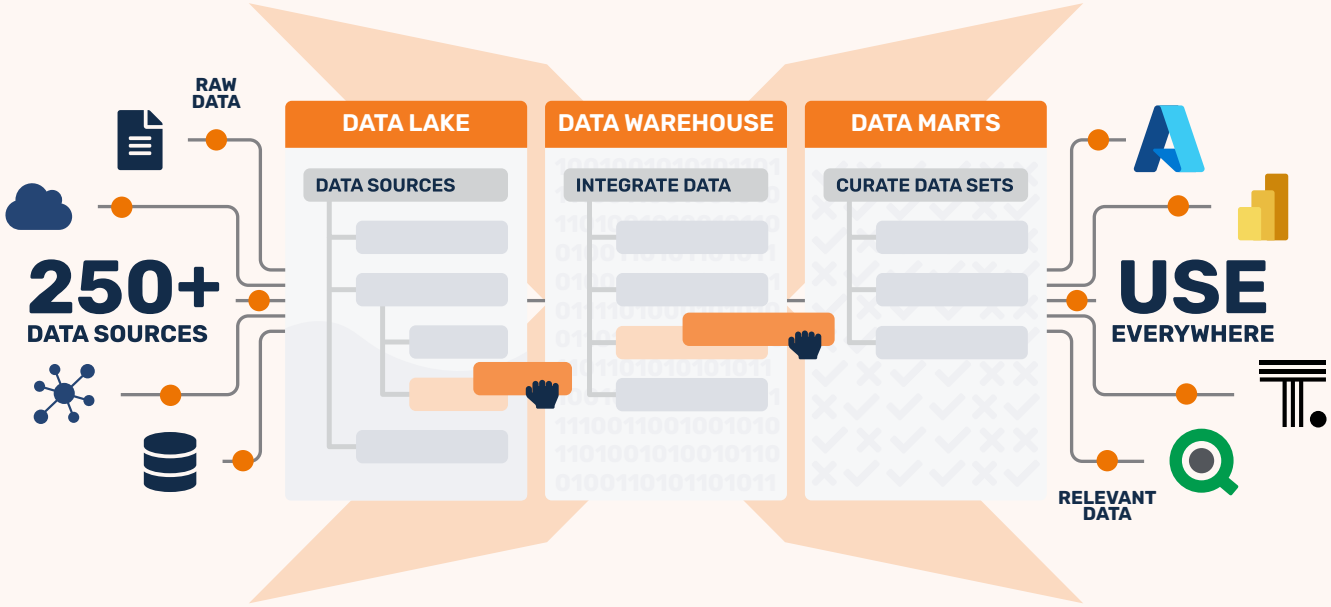
BI and analytics experts get a code-free experience for creating their own data products – no more bottlenecks.

TIMEXTENDER'S DATA ESTATE BUILDER

LOW-CODE. AGILE. INTEGRATED.

Manual coding	→	**Low-code simplicity**
Lengthy implementations	→	**Agile integration**
Strict lock-in	→	**Future-proof scalability**
Fragile pipelines	→	**Smart pipelines**
Waiting months for analytics	→	**Fast self-service analytics**
Fragmented governance	→	**Holistic governance**
Security vulnerabilities	→	**Enterprise-grade security**

HOW TIMEXTENDER ACCELERATES YOUR JOURNEY TO DATA EMPOWERMENT



Low-Code Simplicity

TimeXtender empowers you to build a modern data estate 10x faster with a simple, drag-and-drop solution for data ingestion and preparation. Our data estate builder automatically generates all code and documentation, which reduces build costs by 70%, frees data teams from manual, repetitive tasks, and empowers BI and analytics experts to easily create their own data products.

Don't worry! Powerful developer tools, SQL scripting, and custom coding capabilities are still available, if needed.

Agile Integration

TimeXtender seamlessly overlays your data infrastructure, connects to any data source, and integrates all the powerful data preparation capabilities you need into a single, unified solution. This eliminates the need for complex stacks of tools, lengthy implementations, and costly disruptions, while still giving you complete control over how your data is stored and deployed.

Future-Proof Scalability

Because TimeXtender is independent from data sources, storage services, and visualization tools, you can eliminate vendor lock-in, and ensure your data infrastructure is highly-scalable to meet future analytics demands. With TimeXtender, you can quickly adopt new technologies and deployment models, prep data for AI and machine learning, and migrate to cloud platforms with one click.

Smarter Pipelines

When unexpected changes occur, fragile pipelines can easily break and must be manually debugged. With our metadata-based approach, whenever a change in your data sources or systems is made, you can instantly propagate those changes across the entire pipeline with just a few clicks. In addition, TimeXtender provides built-in data quality rules, alerts, and impact analysis, while leveraging machine learning to power our Intelligent Execution Engine and Performance Recommendations.

Self-Service Analytics

Our low-code technology, drag-and-drop interface, and Semantic Layer allow for fast creation and modification of data products, without requiring extensive data engineering knowledge. These data products can be created by BI and analytics experts once, and then be deployed to multiple visualization tools (such as Power BI, Qlik, or Tableau) to quickly generate graphs, dashboards, and reports.

Holistic Governance

Our metadata-based approach allows neat organization of your data estate while providing end-to-end documentation, data lineage visualization, and version control. By using metadata to drive the model and deploy the code, TimeXtender never requires any access or control over your actual data, eliminating security vulnerabilities and compliance issues, while giving you a holistic view of what is happening across your entire data estate.

Enterprise-Grade Security

TimeXtender's security features allow you to provide users with access to sensitive data, while maintaining data security and quality. You can easily create database roles, and then restrict access to specific views, schemas, tables, and columns (object-level permissions), or specific data in a table (data-level permissions). Our security design approach allows you to create one security model and reuse it on any number of tables.

Trust and Support

As a Microsoft Gold-Certified Partner, we have 15+ years of experience building modern data estates for over 3,300 organizations with an unprecedented 95% retention rate. When you choose TimeXtender, one of our hand-selected partners will get you set up quickly and help you develop a data strategy that maximizes results, with ongoing support from our Customer Success and Solution Specialist Teams. We also provide an online academy, comprehensive certifications, and weekly blog articles to help your whole team stay ahead of the curve as you grow.

Learn how to become Data Empowered with TimeXtender

Watch a demo[12] to learn how we can help you build a modern data estate 10x faster, become data empowered, and win in the Machine Economy.

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