

whitepaper

Integrating Velocity

with Low-code / No-code platforms for rapid remediation



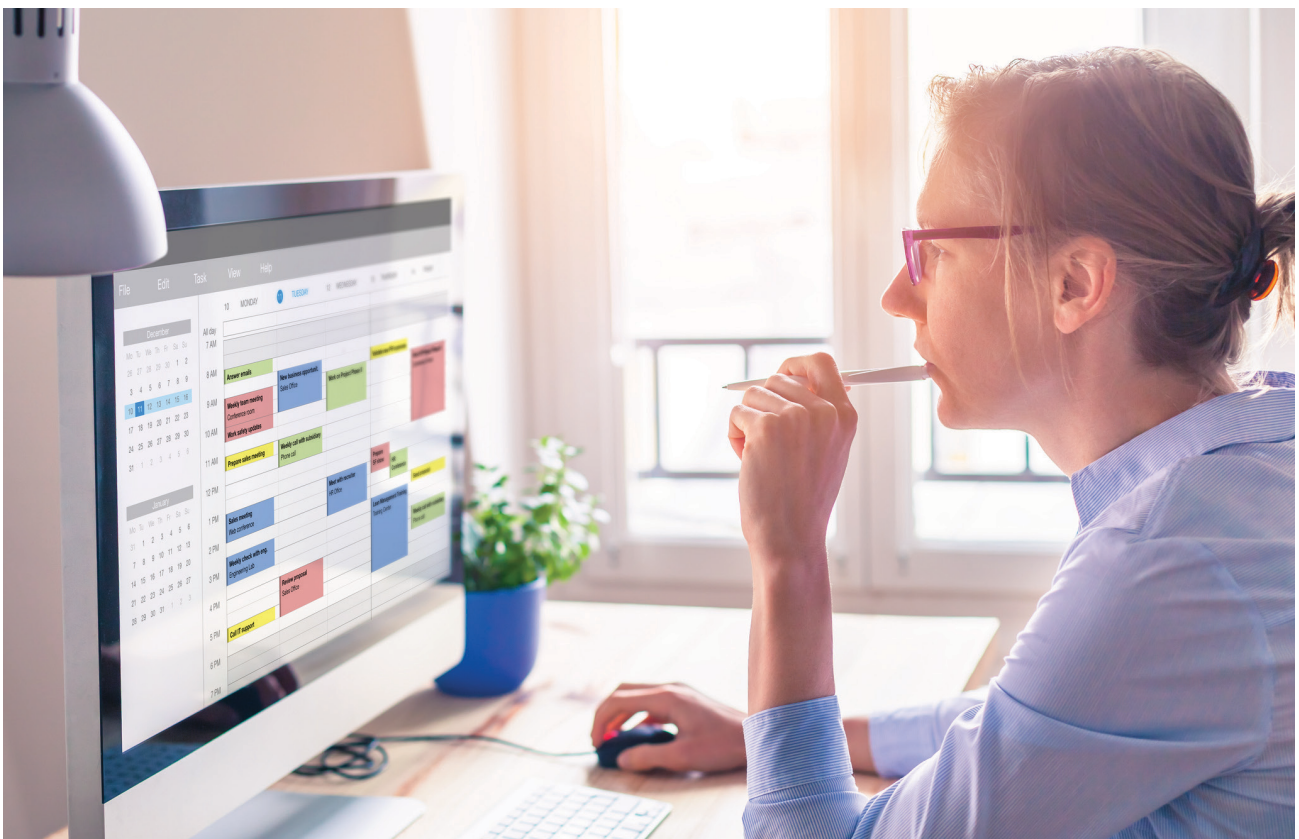
Abstract

While the adoption of the low-code / No-code Platforms will continue to grow, we see a significant opportunity to improve the Excel EUC remediation timeline while increasing the level of compliance for end-user solutions without a large impact on end users by integrating the capabilities of Boardwalktech's Velocity with existing Low-code / No-code platforms.

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Executive summary

Low-code / No-code platforms are used within global enterprises, including banks and financial institutions, to remediate End User Computing (EUC) requests at each LOB Level. Velocity, developed by Boardwalktech, is a plug-and-play platform with low-code / no-code capabilities designed to mitigate the risks that Excel poses to enterprises.

As the utilization of low-code / no-code platforms continue to expand, there exists a notable potential for enhancing the timeframe of remediation in the context of Excel-based EUC workloads. By incorporating the functionalities of Velocity with pre-existing low-code / no-code platforms, the compliance level for these end-user products can be enhanced. Furthermore, by leveraging Velocity's unique data architecture, migrating to a compliant end-user solution can be done with low impact on the end users and preservation of the Excel experience

A high-level proposal

Velocity has an innovative patented capability to convert Excel data and models into a database application. The platform converts Excel into a full three-tier application stack by absorbing the Excel data/model. It then allows the end user to interact with the data using an innovative "Excel Browser" feature. This feature ensures secure data access by dynamically downloading access-controlled data upon authentication. It wipes the data clean from Excel memory upon closing the file, thus eliminating the security risk associated with Excel. This makes change management effective with a very low impact on end users in terms of testing, training, and using the new system. The implementation of Velocity allows the utilization of APIs for accessing data onboarded from multiple enterprise data sources. Deploying hosted APIs within an organization involves containerization, route exposure, authentication and authorization for security, and monitoring and management for optimal performance.

Our proposed solution can enable enterprises to develop an intelligent data arbitrator that can seamlessly coordinate data modeling for advanced visualization engines and low-code / no-code application platforms. This will facilitate the automation of EUC workflows and streamline the process of generating intuitive reports. Utilizing a Velocity-based data arbitrator can assist enterprise architects in developing loosely coupled architectures and reusable design patterns for providing optimized EUC remediation user journeys.

The implementation of robust cross-border data compliance strategies, along with privacy mechanisms for enterprise user groups, can be highly beneficial.

A baseline for EUC migration activities

Every EUC migration will go through the following stages to achieve compliance by transforming an EUC into an end-user solution.

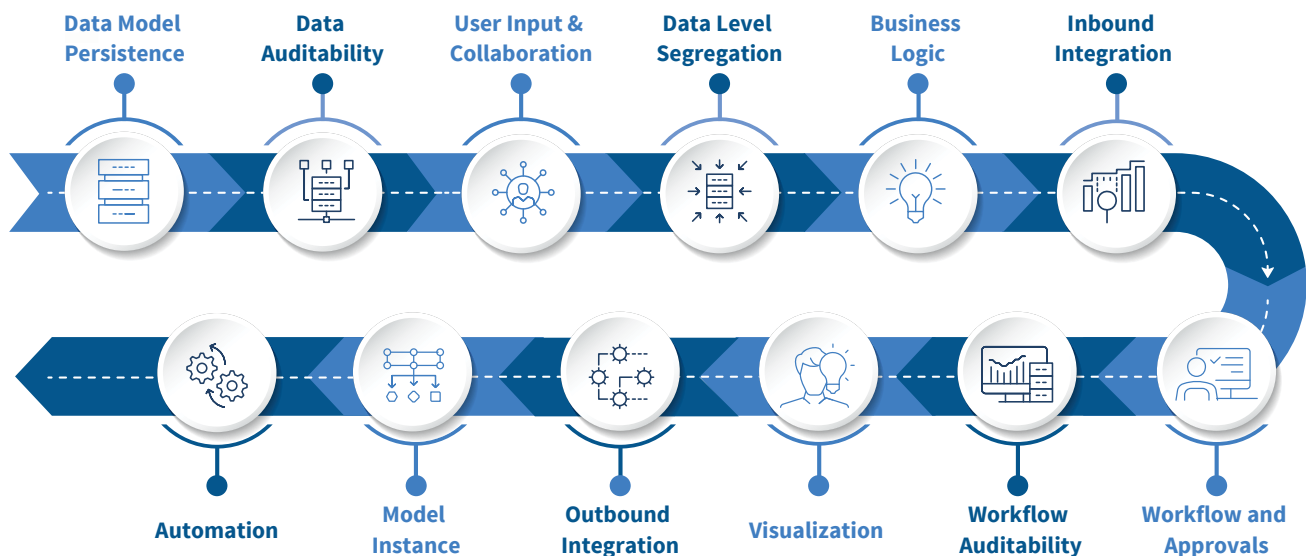


Figure 1: EUC Migration Pathway

1. Core Data Model Persistence

This stage will create a storage model for the core data model of the EUC.

2. Data Auditability

This stage will support data level auditability to capture which user did what, why, and when in terms of structural changes like new rows or columns or data level changes.

3. User Input and Collaboration

This stage will allow users to enter their inputs with validation and allow collaboration with peers before publishing the output to other teams and systems.

4. Data Level Segregation

In this stage, role-level segregation rules are applied for activities related to workbooks, worksheets, columns, and row manipulation.

5. Business Logic

The user will apply approved calculations and macros, and the output of this step is to be stored back in the database.

6. Inbound Integration

Data is extracted from intended data sources such as SQL DB tables. The system will apply validations and business rules on the incoming data stream, mapping it to the EUC core data model.

7. Workflow and Approvals

A workflow is set up to notify the next user or role to perform their function and participate in the approval process

8. Visualization

Data is transformed into required reports or visualizations that will be presented as per the data reporting expectations.

9. Outbound Integration

The final approved dataset is sent to the target systems or downstream processes for integration.

10. Model Instance

The EUC Master Model is set up so it is copied multiple times based on the process frequency to reuse for monthly, weekly, or daily processes. The model reuse can be within a group or across a BU or the organization.

11. Hyperautomation

In many instances, the EUC process can be automated for execution on the server. Support for such automation will reduce manual human intervention and increase the speed of the process.



Low-code / No-code platform capabilities

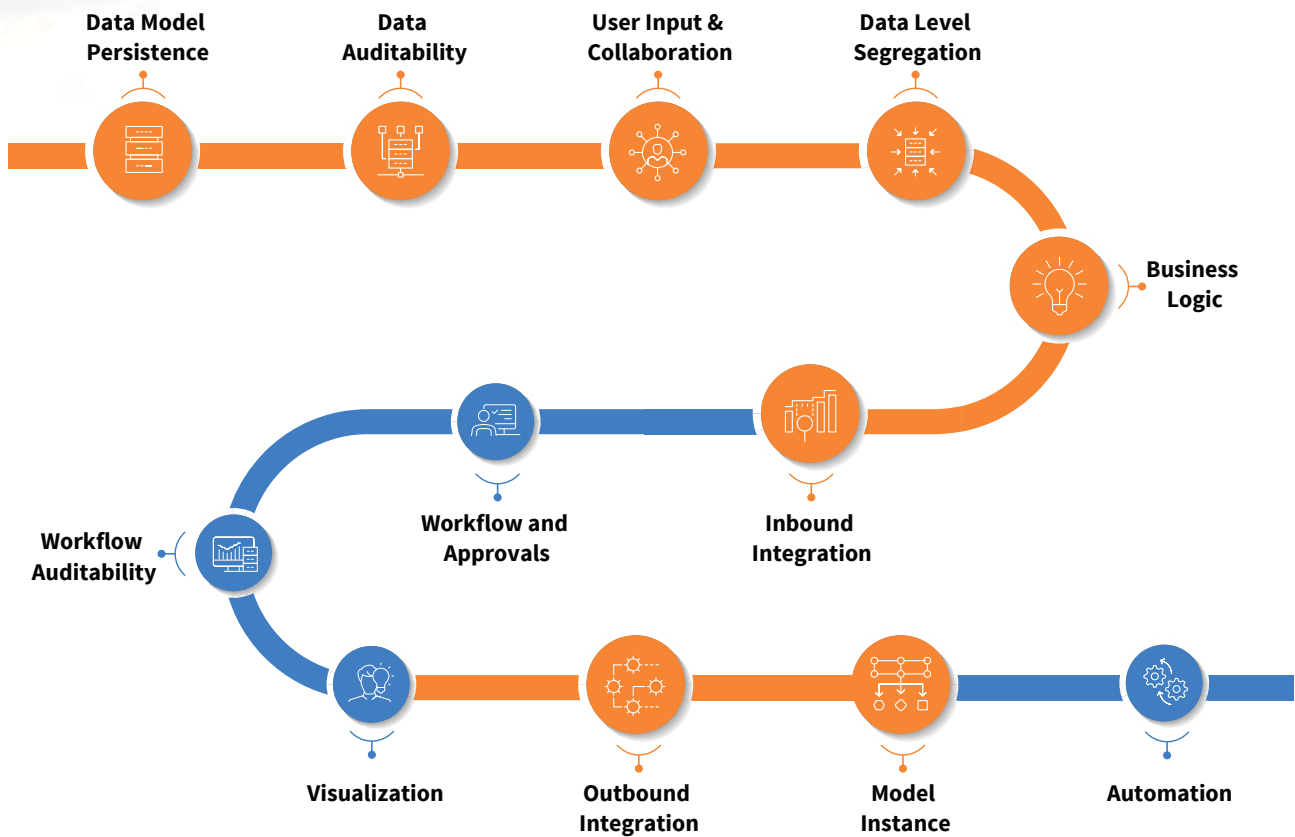


Figure 2: Low-code / No-code platform capabilities: ■ Strengths ■ Custom Development

Low-code / No Code platforms offer comprehensive capabilities in workflow management, visualization, and automation. They provide tools to configure and code core objects, data modeling, etc., but it requires a substantial custom development effort. These custom development efforts result in expensive time and cost investments and significantly impact end users for requirements, testing, and adoption.

We see a significant opportunity to reduce the Excel EUC remediation timeline while increasing the level of compliance for end-user solutions with low impact on end users by integrating the capabilities of Velocity with existing low-code / no-code platforms.

Velocity value-added capabilities



Figure 3: Velocity capabilities ■ Strengths ■ Configuration or Custom Development

1. Core data model persistence

Velocity automatically creates persistence by absorbing the EUC Data Model. The Excel model to Velocity data model conversion is automated and centrally located in an SQL Server without any coding or design and an added capability of persistence. Rapid persistence of the core data model by Velocity reduces migration time and increases compliance levels by automatically creating a three-tiered application.

2. Data auditability

Velocity supports cell, row, column, grid, and workbook-level auditability. It can also capture the auditability of approvals and workflow notifications. This capability will add data-level auditability and governance.

3. User input and collaboration

Velocity preserves the user experience of the EUC and presents native Excel operating like a Browser. Users download and enter data and then submit it to the server. Velocity also supports concurrent iterative collaboration between users to align on the data. Preserving the Excel experience will result in low user impact, adding data validation will improve data quality, and collaboration will improve the process efficiency.

4. Data-level segregation

Velocity supports workbooks, worksheets, data grids (Cuboid), row and column-level access control, and segregation of duties by role and individual users. Fine-grained segregation of duties results in increased compliance levels.

5. Business logic

Velocity preserves the existing formulas and macros. After migration, these macros and formulas are put under proper SDLC control to prevent ad-hoc changes. This value add enhances support for the large spectrum of EUCs that need macro and formula migration.

6. Inbound integration

Velocity supports ETL-based rules to connect external data sources to the main data models. It can also support data aggregation, data flow rules between systems, and other downstream end-user solutions. This added capability will accelerate data integration timelines.

7. Outbound integration

Velocity supports rule-based data exports to SQL and File and provides access to data using Rest APIs. Rule-driven outbound integration and downstream process connectivity will quickly deliver cost and time efficiencies.

8. Model instance

Velocity can support master-instance models where models are copied to create multiple iterations based on process frequency or usage rules.

How velocity benefits a low-code / no-code platform

Adding Velocity capabilities to the no-code platform results in the following benefits to both the end user and IT organizations trying to endure compliance levels for Excel-based EUCs.

End-user experience

- Lower impact on users in terms of requirements, testing, and adoption
- Data-entry validations to improve data quality
- Collaboration to improve process efficiency
- Server-side calculations to improve stability and Excel experience
- Process automation to improve efficiency and reduce errors

Compliance level

- Data persistence to achieve technology application architecture
- Data auditability to increase accountability and root cause analysis
- Data quality to get better process outcomes, reduced penalties
- Server-side integration to improve stability and increase the scale
- SDLC management of macros and formulae

5x cost and time impact

Velocity provides time and cost improvements in the following areas -

- Time to create persistence
- Time to support auditability
- Time to integrate with other systems
- Time to migrate macros and formula



Velocity platform architecture

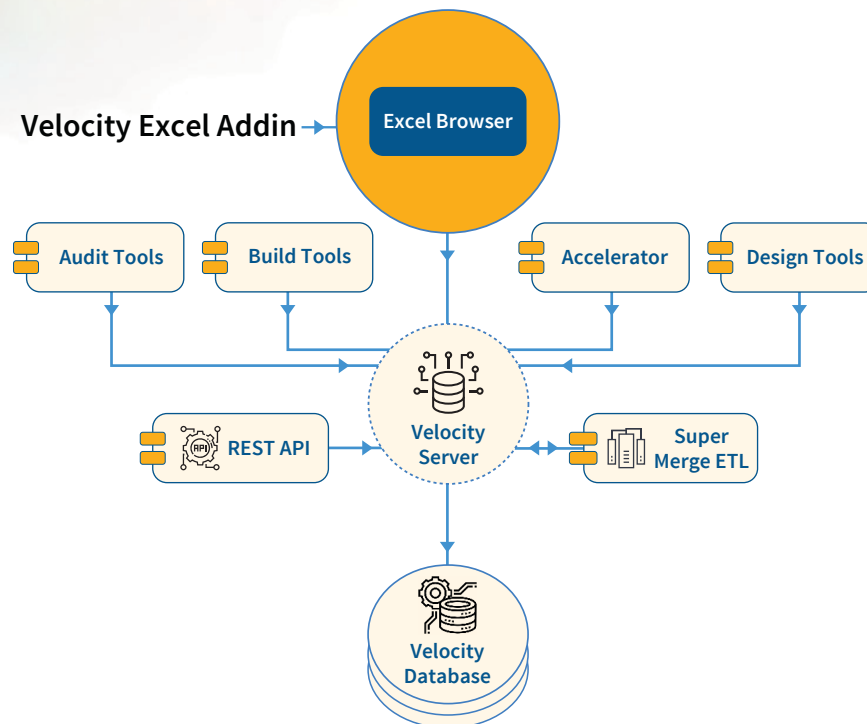


Figure 4: Key components of the Velocity platform

1. The Velocity database holds a catalog of positional grids called Cuboids. Each Cuboid is mapped to Excel ranges within a worksheet, SQL table, or File Data. The Cuboids hold all data and structural changes from the time of their inception.
2. The Excel Browser is a desktop-based secure Excel interface that allows authorized users to download Cuboids, edit them, and store them back in the server.
3. The Excel Addin Client acts as a bridge between the Excel and the Velocity Server.
4. SuperMerge is a rule-based ETL layer that connects Cuboids to SQL tables, files, and other Cuboids.
5. Rest API is an interface layer to interact with the Velocity platform programmatically.
6. The Audit tools allow for the governance of activities and changes made by the user.
7. Development Tools
 - a. **Accelerator** - The Accelerator allows for rapid conversion of an Excel EUC into a complete stack application in the Velocity Platform.
 - b. **Design Tools** - The Design Tools allow for the configuration of the templates, validations, access control, and ETL rules.
 - c. **Build Tools** - These are SDLC tools for the migration of applications between dev, test, and production environments.

low-code / no-code platforms architecture

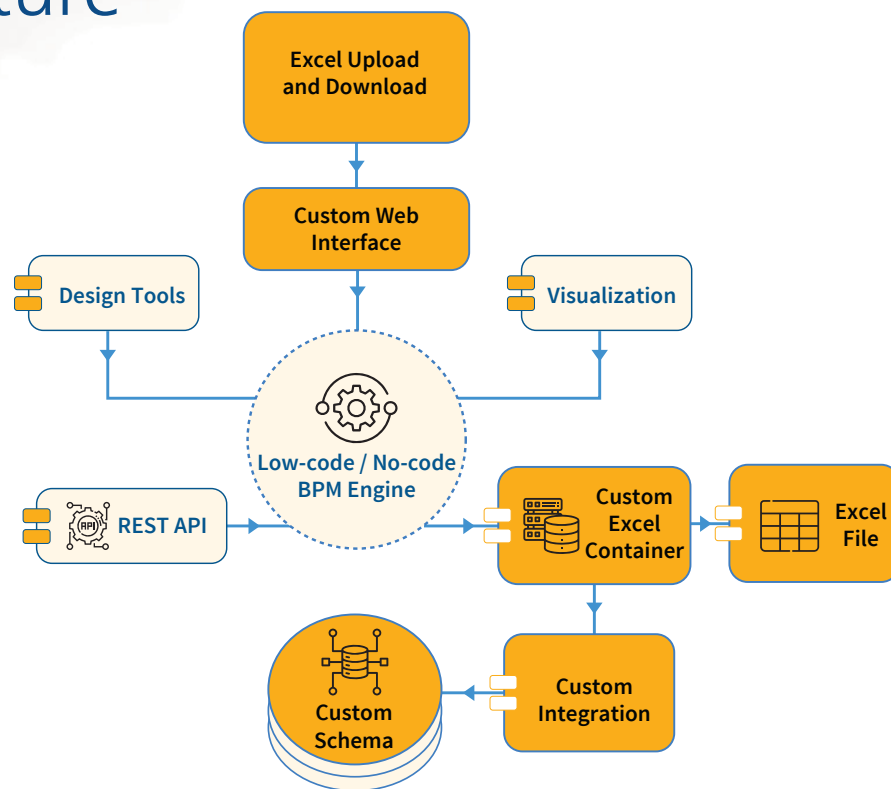


Figure 5: Key components of a low-code / no-code platforms when focused on Excel EUC migration

1. This BPM Engine is a workflow or a process automation flow engine that orchestrates user activities, notifications, and approvals.
2. The Rest API interface allows the configuration of users, roles, and application profiles and interacts with the BPM engine.
3. For the Excel EUC migration, some custom components are developed to support Excel processes.
 - a. Custom SQL Schema to store the integration data and process output
 - b. Custom integration or programmed APIs to interact with the application
 - c. Upload/Download Excel files that are either inputs or outputs of the EUC process
 - d. An Excel container used to instantiate an Excel file with the intent to read the data and load it into the SQL schema or read data from the SQL table and map it to the Excel file.

Proposed architecture

Using a hybrid approach, we use Velocity in Stage 1 to transform the Excel EUC to Cuboids that are centrally located in an SQL Server. This is done without any coding or design and with the added capability of persistence. Using Velocity in Stage 1 for complex EUCs will result in a significantly reduced timeframe compared to other no-code solutions.

Once done, the data is staged in the Cuboid database (DB), which can be integrated over APIs with any visualization engine to access and update the Cuboids as required. Next, we can configure workflow screens on workflow automation Low-code / No-code platforms, which can access Cuboid DB over APIs to gather the presentation data. Its visualization engine can be utilized to generate intuitive workflows and reports at a much lesser cost than currently employed. The workflow screens will access Cuboids over APIs and give the end user a more intuitive user experience than the present one.

Here is the proposed integration architecture that can be explored to materialize the benefits of Hyperautomation between these two types of platforms.

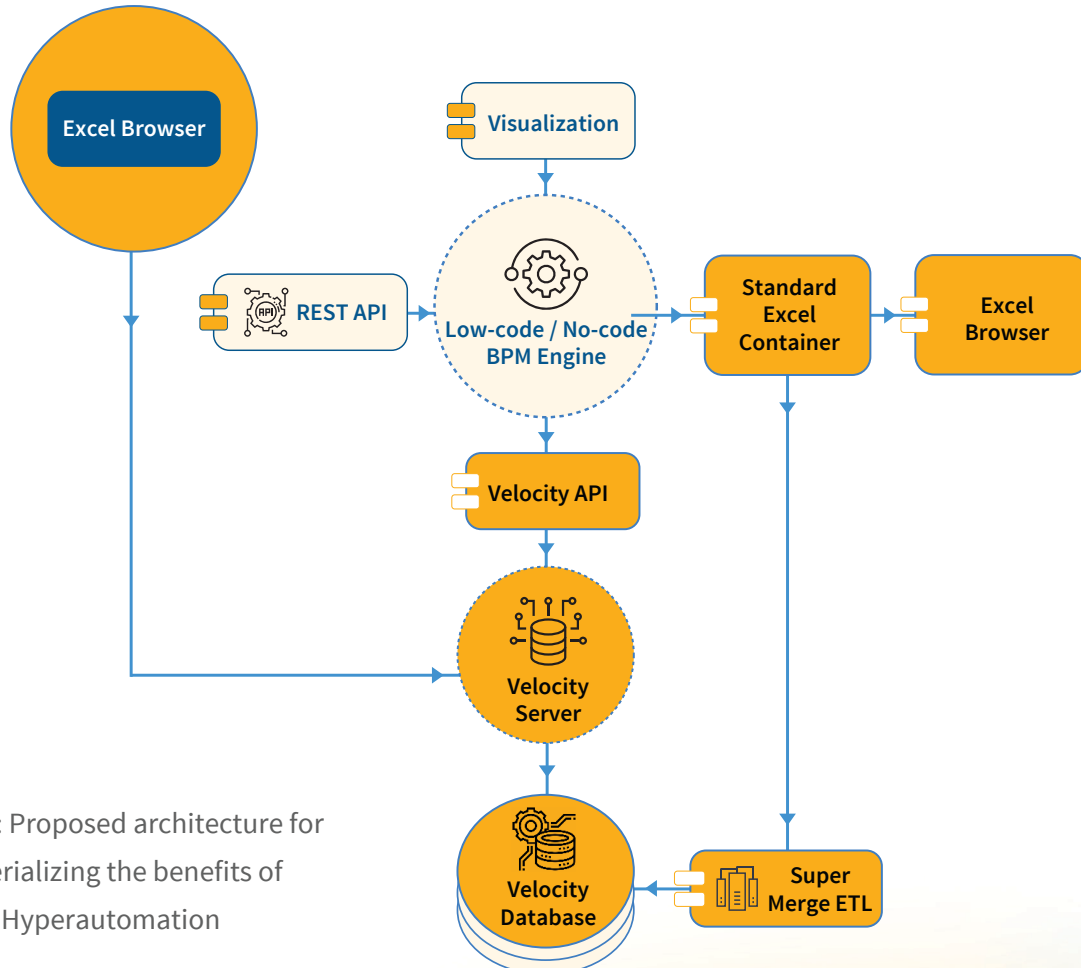


Figure 6: Proposed architecture for materializing the benefits of Hyperautomation

The proposed architecture, once developed, would have none to very limited custom development. This proposed architecture would provide the expected benefits of rapid remediation at a very low cost and with a very low impact on users.

The following components must be added to the Boardwalktech's Velocity to support this architecture.

- Integrate current REST APIs with enterprise security components
- New REST APIs to enable ETL invocation
- Template container to invoke template methods and message/error reporting
- Template authentication for mirroring a user or system profile

The LTIMindtree team has also embarked on a proof of concept on the lines of this whitepaper with the Boardwalktech's team to measure the efficiencies and outline the advantages of Boardwalktech's Velocity. We are working closely with our A-list clientele to take the efficiencies in their in-flight user stories on LCAP.

Conclusion

The purpose of this whitepaper was to bring forth the advantages of Boardwalktech's Velocity platform in developing a vendor-neutral data pipeline. Such a pipeline improves the efficiencies in user journeys for low-code / no-code application platforms. Developing data flows that utilize Velocity makes the solution future-proof for multiple low-code / no-code Application Platforms, especially for the production rollout supporting continuous integration and deployment strategies.

Technology endpoints for Velocity Orchestration

- REST API
- SQL Procedures
- .NET Container



Authors



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Sushant envisions his role beyond the conventional and has experience steering the concepts of amalgamating platforms strategically to improve their overall outcome. He balances the intricacies of innovation, scalability, and resilience. Endowed with a profound understanding of business objectives and technological landscapes, his work has been pivotal in envisioning and articulating a cohesive architectural strategy for clients. Sushant has been guiding our development team in crafting solutions that transcend current challenges and align seamlessly with LTIMindtree's organizational aspirations.



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Dharmesh has over two decades of experience helping professionals and organizations derive maximum actionable value from “As-Is Data and Documents.” He has been helping clients with intelligent information management solutions without expensive digital transformations. Dharmesh specializes in Data Management, Supply Chain Visibility, Perfect Order Execution, PLM, B2B Integration, ERP integration, Technology Sales, and Spreadsheet process automation and compliance.

About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 82,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit <https://www.ltimindtree.com/>.