comunity
build the future

COMUNITY DIGITAL PLATFORM FOUNDATION
TECHNICAL DESCRIPTION

UNLOCKING THE POWER OF DIGITAL PLATFORMS

Digital platforms are transforming the way we live and work by seamlessly connecting people, organisations, and resources across value ecosystems. They enable organisations that adopt platform operating models to scale at relatively low marginal cost, achieving greater market impact and stronger economic returns.

Achieving Digital Platform success is no longer about launching one great app, but rather requires choreography of many individual digital components through a powerful and reusable Platform Foundation. The fastest, lowest-risk way to do that is to build on the Com-Unity digital operating platform - a layered, reusable backbone that every product team can rely on for security, data, integration, compliance, and runtime excellence. Instead of each initiative 'reinventing the digital platform plumbing', the platform provides paved roads so digital service teams can focus on differentiated customer value.

WHAT PLATFORM TEAMS GET FROM THIS APPROACH:

- **Speed with control:** Golden paths, automation, and self-service environments compress time-to-market while keeping approvals, guardrails, and audit evidence built-in.
- **Risk reduction by design:** Security, compliance, observability, and resilience are standardized once and reused everywhere.
- **Economics that improve over time:** Shared capabilities (identity, data, APIs, comms, payments rails, AI) turn fixed costs into reusable assets, lowering unit costs per customer and per feature.
- **Enterprise agility without chaos:** Clear contracts between the platform and product teams enable autonomy at the edges with strong governance at the core.
- **Future-proofing:** An API-first, data-centric, cloud-native foundation makes it easy to add partners, new business lines, and AI capabilities when the opportunity arises.

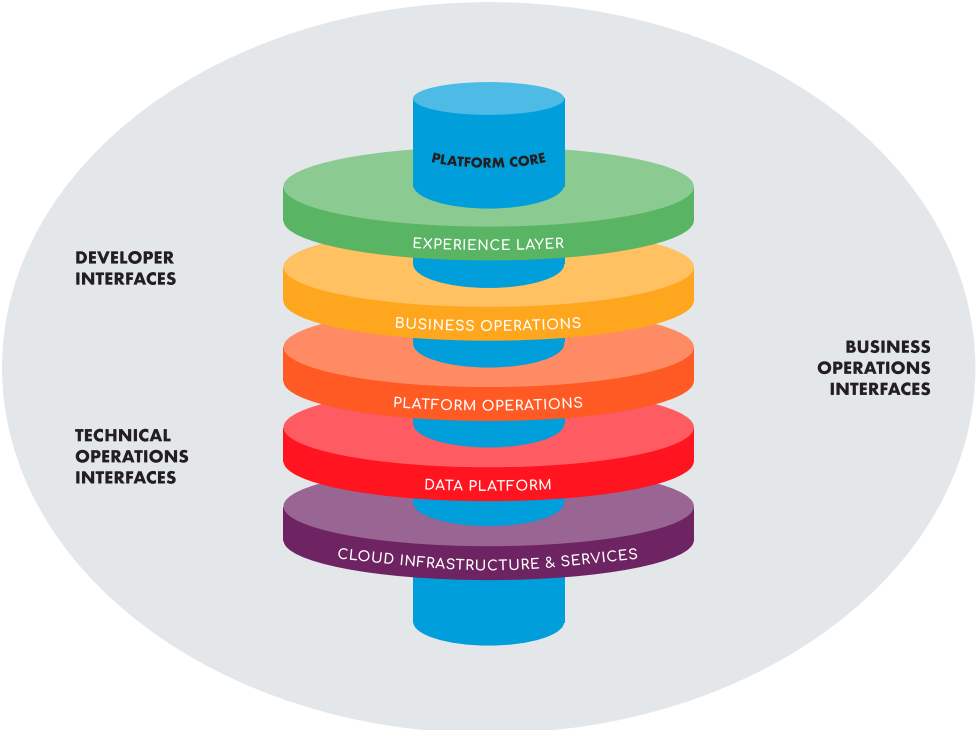
This ComUnity Platform Foundation supports a true Platform Engineering based approach by providing a layered architecture, strong trust foundations, API-centric capabilities, low-code builders, and integrated FinOps accountability. These foundational capabilities are delivered to builders and operators of digital systems via a powerful Platform Toolkit, which includes strong support for self-service business operations via our ComUnity Central.

The ComUnity Platform provides all the technology required to design, build, manage, report, and evolve a digital platform, enabling an organization to re-envision, rebuild and refine its pathway into the future.

The product consists of a core surrounded by several functional layers, with an integrated developer environment and administration features.

COMUNITY DIGITAL PLATFORM FOUNDATION

Simplifying and accelerating delivery of digital platforms, products and services



PLATFORM CORE

The ComUnity Platform Core connects users and devices running on the Internet with ComUnity back-end services. It is responsible for handling requests for work from clients and distributing these requests to back-end services while ensuring operational requirements like security, privacy and reliability are met. Its architecture enables a highly scalable server implementation.

COMPONENTS OF PLATFORM CORE

Secure Channel	Ensures secure communication with clients over TLS 1.2, offering message privacy, tamper protection and server authentication.
Compression	Dynamic content compression ensures bandwidth is minimized for JSON payloads.
Instrumentation	Uses OpenTelemetry for logs, traces and metrics. All requests are instrumented from the moment they are initiated. Traces are tracked across process boundaries of all backend components.
Authentication	Verifies the identity of the user issuing a request. HTTP Basic Authentication and OAuth2 are supported. If authentication fails, the request processing stops and an error response is returned. Requests for public media are not authenticated.
Routing	Passes the request to the appropriate subsystem. Subsystems include structured data, media, file upload/download and metadata.
Authorization	Requests are authorized by checking the method and resource requested against the roles of the identified user. If the checks fail the request processing stops and a 403 Forbidden response is returned. Permissions can be set on the application level or the entity level. This limits the ability of malicious users for denial-of-service attacks.
Caching	Static content caching is supported for the media handlers through HTTP cache expiration. The dynamic content cache is supported for data handlers through HTTP cache validation.
Data Governance	The Platform implements privacy-by-default so that once an entity is marked as private, attempts to manipulate data without applying proper governance controls result in no changes without returning any private information.
Slipstream	Simultaneous reads on the same resource are guaranteed to return the same result which allows the Core to issue a single request. This optimization dramatically reduces database resource load when there are many requests.
Live Connect	This mechanism allows clients to be notified about changes to specific data queries with low latency and minimum bandwidth usage. It is supported for all clients capable of communicating with HTTP.

SUBSYSTEMS IN THE PLATFORM CORE

Structured Data	Uses the OData protocol that allows access to application data, referencing the platform data model. Bulk update and delete operations are enabled by combining OData syntax for single operations with the query grammar. This results in very efficient calls to the database potentially affecting millions of records in a single call. It avoids the garbage collection problem where service functions falling into disuse can never be removed for fear of breaking something that may only be activated occasionally.
Media	This is an adaptive content service that includes a grammar for image processing. It allows clients to request images that are exactly the right size, optimizing image quality and network bandwidth.
Files	Handles public and private files. Downloading files supports resume and partial read. When downloading public files, the local file system is first checked before downloading from cloud storage. When uploading files, the file is uploaded to cloud storage so other servers will be able to find the file. Private media files require authentication and authorization.
Metadata	Collects metadata from the application database and from the metadata model built by the Platform Toolkit. This serves a document describing the data model and the UI of the application.

CLOUD INFRASTRUCTURE AND SERVICES

In the context of platform engineering, cloud computing capabilities are often referred to as the "Base Platform". Cloud computing capabilities can be split into two main categories:

- Infrastructure
- Code/Application services

These categories differentiate between infrastructure-level services and those that support code customisation and application development.

For the ComUnity Platform, the supported cloud platform is Microsoft Azure.

Infrastructure Services

These services provide foundational compute, storage, and networking resources that are typically managed through Azure's management interfaces, such as the Azure Portal, Azure CLI, or Azure REST API. They do not require application-level coding for their basic operation.

Compute Resources	Azure Virtual Machines: Scalable virtual machines in the cloud. Azure Container Apps: A serverless platform for running containerized applications.
Storage	Azure Blob Storage: Object storage for unstructured data. Azure Disk Storage: Persistent, high-performance block storage for VMs. Azure Files: Fully managed file shares in the cloud that use the standard SMB protocol.
Networking	Azure Virtual Network (VNet): Provision of logically isolated networks. Azure Load Balancer: Network load balancing services for high availability. Azure Content Delivery Network (CDN): Fast content delivery to users worldwide.
Basic Security	Azure Firewall: Managed, cloud-based network security service. Network Security Groups (NSGs): Control network traffic to and from Azure resources. Azure DDoS Protection: Protection against distributed denial-of-service (DDoS) attacks.

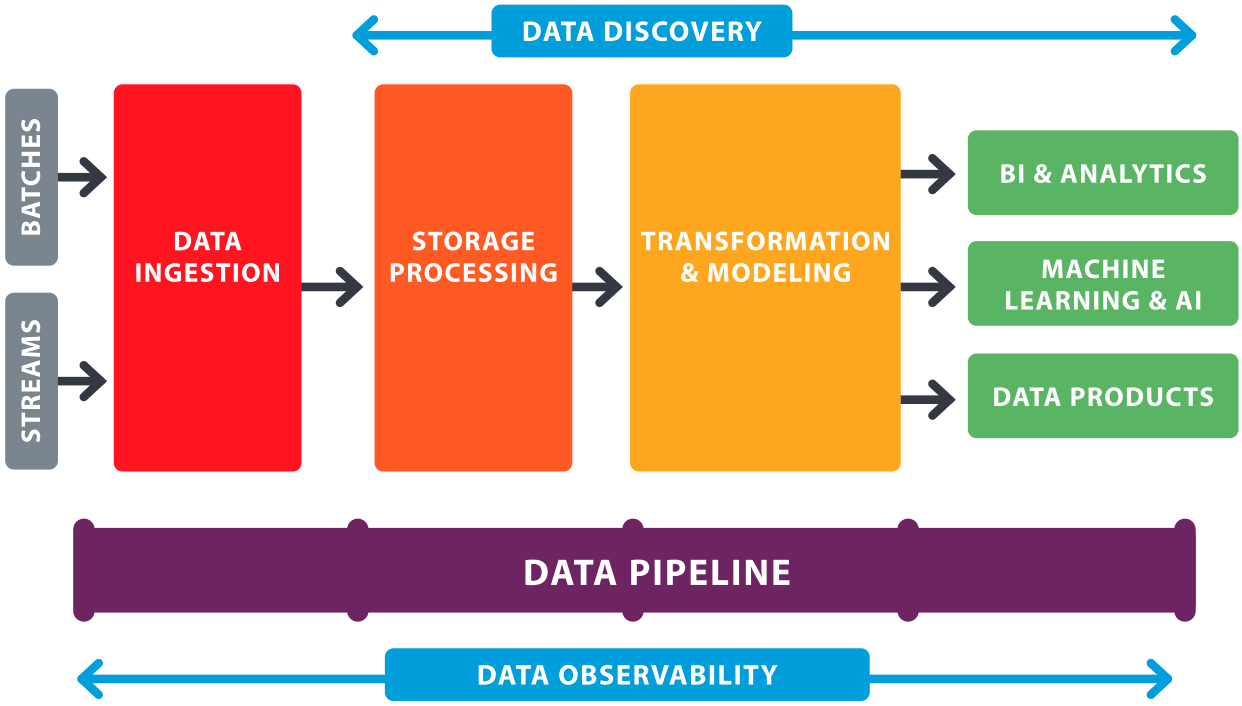
Code/Application Services

These services provide higher-level functionalities that often require custom code or application development. They integrate directly with application code and support the development and deployment of applications.

Server-less Computing	Azure Functions: Event-driven, server-less compute service. Azure Logic Apps: Automate workflows and integrate apps, data, services, and systems.
Managed Databases	Azure SQL Database: Fully managed relational database with built-in intelligence. Azure Cosmos DB: Globally distributed, multi-model database service.
Middleware	Azure Service Bus: Messaging service for connecting applications, services, and devices. Azure Event Grid: Event routing service for building event-based applications.
AI and Machine Learning	Azure Machine Learning: Platform for building, training, and deploying machine learning models. Azure AI Services: APIs and services for adding AI capabilities to applications, such as vision, speech, language, and decision-making. Azure AI Foundry: a unified, integrated platform for building, managing, and deploying generative AI applications and agents.

DATA PLATFORM

The Data Platform component of the ComUnity Platform provides a unified and scalable foundation for managing diverse data types, including transactional, operational, and analytical datasets. It is designed to seamlessly ingest, transform, store, and analyse data from various sources. Built on advanced technologies like Microsoft Fabric and Azure SQL, the platform integrates the scalability of a data lake with the structured query performance of a data warehouse. This architecture supports transactional data, databases optimized for analysis and reporting, real-time and batch processing, making it ideal for both operational applications and advanced analytics workloads. The ComUnity Data Platform comprises built-in tools for data integration, transformation, and AI-driven insights, while providing a robust foundation for powering dashboards, reports, and data-driven applications. It also contains features that ensure data consistency, governance, and compliance.



VALUE OF THE DATA PLATFORM

The Data Platform and Platform Engineering functionality provide value metrics that translate technical capabilities—such as consistent data ingestion, scalable storage, automated governance, and seamless integration for BI, analytics, and ML—into quantifiable outcomes, so organizations gain a clear understanding of the return on their investments.

These metrics enable stakeholders to see beyond theoretical benefits, revealing concrete improvements in time-to-market, cost savings, reliability, compliance, and data quality. With well-defined value metrics, teams can prioritize enhancements, justify budget allocations, benchmark progress, and continuously optimize the platform. Ultimately, measurable value helps align technology efforts with strategic business goals, ensuring the Data Platform and Platform Engineering efforts contribute directly to sustained competitive advantage and growth.

PLATFORM OPERATIONS

Platform operations provide the necessary resources and capabilities to quickly and efficiently develop and deliver digital products and services. The components used to build higher-level applications and services are found here.

Centralized configuration	Manage configuration and customization. It provides businesses with a single, unified view of all configuration options and settings, as well as a centralized interface for making changes and updates. It simplifies and streamlines the process of configuring and customizing the platform, while also reducing the risk of errors and inconsistencies.
Communication	The various tools and technologies used for facilitating communication and collaboration between customers, users, and businesses.
Observability	Used to monitor and give overall visibility of the behaviour and performance of the platform, including logging, tracing, metrics collection and analysis. It provides real-time and historical data into how the platform is functioning and how users are interacting with it. The information can be used to identify and resolve issues, optimize performance and improve the overall user experience.
Security	The technologies, policies, and practices used to protect the platform and its users from cyber threats and data breaches. It includes encryption, authentication, access controls, threat detection and response. It protects the confidentiality, integrity, and availability of the platform and its data.
Search	Allows applications and users to search and retrieve data and information from the platform. This includes full-text search, faceted search, and search suggestions. It makes it easier for users to find the information they need and to deliver relevant results based on their queries.
API gateway	Manage the APIs (Application Programming Interfaces) used by the platform. It acts as an intermediary between API consumers and API providers, and provides a range of functions, such as security, traffic management, governance and rate limiting. It simplifies and secures the process of accessing and consuming APIs, while also providing businesses with a unified view of their APIs.
Media services	The repository for managing and delivering media content, such as images, videos, and audio, including features image and video manipulation, transcoding, and compression. It improves the user experience by making it easy to upload, manage, and deliver high-quality media content, and to ensure that the content is optimized for various devices and platforms.

Data governance services	The policies, procedures, and tools used to manage the availability, usability, integrity, and security of data within the platform. This helps ensure that data is properly managed, protected, and controlled throughout its lifecycle. It includes data cataloging, data quality management, data privacy and security. It provides the visibility and control needed to manage and use data effectively, and to ensure that the data is accurate, secure, and compliant with all relevant regulations and standards.
Geographical and location services	The technologies used for mapping, geocoding, and managing geographical and location-based information. This includes map visualizations, geolocation, and geospatial analysis. It allows businesses to incorporate geographical and location information into their platform, and to use this information to gain insights and make informed decisions.
Automation services	Automates repetitive and manual tasks to improve the efficiency and productivity of the platform. This reduces manual effort, minimizing errors, reducing costs, and improving customer experience.

BUSINESS OPERATIONS

Business operations streamline and automate business processes, reducing the time and resources required to manage the business, and providing real-time data and information for decision-making. Business operations are made more effective and efficient by integrating digital technologies into the business processes.

Data curation	Ensures that data is organized, accurate, and available for use when needed, and handles the long-term preservation and accessibility of the data. Some data has to be imported from external sources, validated and cleansed, and then catalogued. It enables organizations to make informed decisions based on accurate data.
Reporting and analytics	Reports can be generated from various data sources and can be delivered in different formats, such as tables, charts, graphs, and dashboards. Analytics makes data easier to visualize and includes data exploration, data visualization, data mining, and statistical analysis. It allows organizations to get insights into their data, allowing them to make data-driven decisions and actions.
Workflow	Organizes tasks into smaller, more manageable steps, making it easier to see what needs to be done, in what order, and by whom. It improves efficiency by streamlining processes, allowing work to be done faster and with fewer errors. Workflows help to ensure that everyone knows who is responsible for each step of the process and improves collaboration.
Business support processes	Includes support for onboarding, marketing, sales, support and customer service.

DIGITAL EXPERIENCE

This contains the components and functions that directly impact a customer's experience with the platform. The customer experience layer is designed to provide a seamless and intuitive experience for customers, helping them easily accomplish their goals and interact with the platform. Effective customer experience design and management involves constantly monitoring and optimizing the platform to ensure that it is user-friendly, accessible, and meeting the changing needs of customers.

Websites	A website can be an important component of a digital platform, as it provides a platform for users to engage with the brand, access information and complete tasks.
Web apps and portals	Refer to online applications that are accessible through a web browser. They enable users to access the platform and its resources from anywhere with an internet connection, providing a wide range of capabilities, including information and resource access, communication and collaboration, and task completion.
Native apps	These are mobile applications that are designed specifically for a particular operating system, such as iOS or Android. Native apps are installed directly on a device. They provide users with access to the platform and its resources through their mobile devices.
Chat	Provides real-time communication channels between users and the platform. Users can interact with the platform and receive support and information in a convenient and accessible manner. It can take the form of text-based messaging or voice/video-based interactions. Chat can be integrated into a variety of digital platforms, including websites, web apps, native apps, and customer service portals.
Online communication	This refers to social media channels, like such as WhatsApp, Facebook, X (formerly Twitter), LinkedIn, Instagram, and YouTube. It provides a platform for building and engaging with the user community. Social media can be integrated into a digital platform in various ways, including through official company pages and profiles, user-generated content, and social media advertising.
Email	Email can be integrated into the digital platform to enable users to send and receive messages directly within the platform. It offers a convenient and accessible way to communicate and collaborate, allowing users to easily exchange information and get support they need.
SMS and USSD	SMS and USSD (Unstructured Supplementary Service Data) are protocols for sending and receiving text messages between mobile devices. They can be integrated into digital platforms to enable users to receive notifications and updates directly on their mobile devices. USSD is often used for real-time interaction, such as mobile banking, mobile payment, and customer support services.
Third party applications and services	Third party applications like Power BI and Office 365 can use the data in the platform to create charts and reports.

PLATFORM TOOLKIT

The Platform Toolkit provides developers with the tools they need to develop and deploy digital products and services. The toolkit includes a comprehensive set of tools, libraries, and frameworks that make it easy for developers to build, deploy, and manage digital products and services.

Toolkit for Build

This involves designing the platform architecture, coding, testing, integrating components, and deploying the platform to a production environment.

Internal developer portal	This is a dedicated portal that provides information and resources for developers who are working on the platform. It is used by the organization's in-house developers or partners and is not accessible to the general public. It is a centralized location for developers to access the resources they need to build, test, deploy and operate applications on the platform.
Integrated Development Environment (IDE)	Provides a comprehensive set of tools and resources for software development. It combines a code editor, compiler, debugger, and other development tools into a single integrated environment, making it easier for developers to manage the development process and build applications. It improves the efficiency and productivity of the development process by providing developers with a centralized location to access the resources they need to build, test, and deploy applications on the platform.
Low-code application development	Low-code is becoming increasingly popular in digital platforms due to its ability to streamline application development and reduce the reliance on specialized technical skills. It provides a visual interface and a set of pre-built components that allow developers and non-technical users to build and deploy applications faster, with less effort and without having to write complex code.
Developer automation	Automation can improve the efficiency and accuracy of development processes. For testing, automation helps to reduce the time and effort required to test new releases and changes, and can also improve the accuracy and reliability of the testing process. In deployment and release process, automation can ensure that new releases and changes are deployed to the platform quickly and reliably. Automating the monitoring and logging process can ensure that issues are identified and resolved quickly and effectively. Automation of the performance optimization process can help to improve the performance and reliability of the platform over time.
Topology	This refers to the high-level arrangement of the software components and applications that make up the ComUnity platform. It shows the different applications, services and functions.
Reusable components	Developer productivity can be improved by making use of reusable components.

Toolkit for Operate

The operate activity refers to the ongoing management, maintenance, and support of the platform once it is live and in use. This is aimed at ensuring the platform is functioning as expected, responding to user requests, and providing the best possible user experience.

Technical dashboards	These provide real-time, graphical insights into the platform's behavior and performance. It includes metrics and information for KPIs, such as resource utilization, application performance, user engagement, and security and compliance status. They enable data-driven decisions on how to optimize the platform's performance.
User analytics	Collects and stores data from websites and apps, and displays reports. It helps protect user privacy and ensure compliance with GDPR and other privacy regulations.
Observability tools and resource management	Involves the collection, aggregation, and analysis of data from sources such as logs, metrics, traces, and other observability data. The data is then used to create a unified view of the platform's behavior and performance, including how different components are interacting with one another and how the platform is responding to changes in load, usage patterns, and other environmental factors.
CI/CD tools	These help teams automate their development, deployment, and testing of new products and enhancements

Toolkit for Data Management

The Platform Toolkit plays a pivotal role in empowering Data Engineers with self-service capabilities for building and managing data platform components. It provides a comprehensive set of tools, templates, and automation workflows specifically designed to streamline the creation, deployment, and maintenance of data infrastructure. Leveraging pre-configured integrations with Microsoft Fabric and Azure SQL, the toolkit simplifies the complexities of data pipeline development, data model design, and Extract-Transform-Load processes. By offering intuitive interfaces and reusable components, it enables Data Engineers to rapidly prototype and scale data solutions with minimal dependency on specialized IT teams. The Platform Toolkit also incorporates governance features to ensure data quality and compliance, making it a vital enabler for agile data engineering and operational excellence within the ComUnity ecosystem.

ComUnity Central

This is where administrators or users can manage, monitor and make changes to various aspects of the platform, such as settings, users, content, security, and performance. It is designed to provide a user-friendly interface for managing complex operations and ensuring the smooth functioning of the platform.

Identity management	This encompasses a set of practices and technologies used to securely manage digital identities, such as creation, authentication, authorization, and termination. It ensures that the right users have access to the right resources at the right time, while also protecting the security and privacy of user data. It includes tasks such as multi-factor authentication, and user provisioning and de-provisioning.
User management	Comprises the tools for controlling who can access the platform and what they can do within it. This includes tasks such as registering new users, setting up user profiles, assigning roles and permissions, managing user passwords, and managing user data.
Role and permission management	Defines and controls access to resources, data and features within the platform based on users' roles and permissions, preventing unauthorized access or changes to sensitive information. Roles and permissions are typically assigned to groups of users based on their job responsibilities and can be customized to fit the specific needs of the organization.
Communities management	Communities often bring together users with similar interests or goals to engage in discussions, collaborate on projects, share resources, and provide support. The goal of community management is to foster engagement, build relationships and create a sense of community among users. It includes tasks such as creating and customizing community spaces, moderating discussions, enforcing community guidelines, and providing support to users.
Content management	Activities include creating new content, uploading and managing existing content, organizing and categorizing content, and publishing content to users. It also encompasses tools and processes for maintaining the accuracy, quality, and relevance of content, such as version control, content approvals, and editorial workflows. It helps to ensure that users have access to the information they need to complete their tasks and meet their goals.
Platform service management	This provides functions for the management, availability, performance, management and maintenance of the platform and its components. It contains the tools, processes, and practices used to ensure the platform functions optimally, and that any issues are quickly identified and resolved. It includes monitoring platform performance and availability, managing updates and upgrades, resolving technical issues, and ensuring platform security.