entando

Reduce Cloud Costs and Accelerate Development

With the leading Open Source
Application Composition Platform
for Kubernetes

www.entando.com

Today's Need for Composable Business

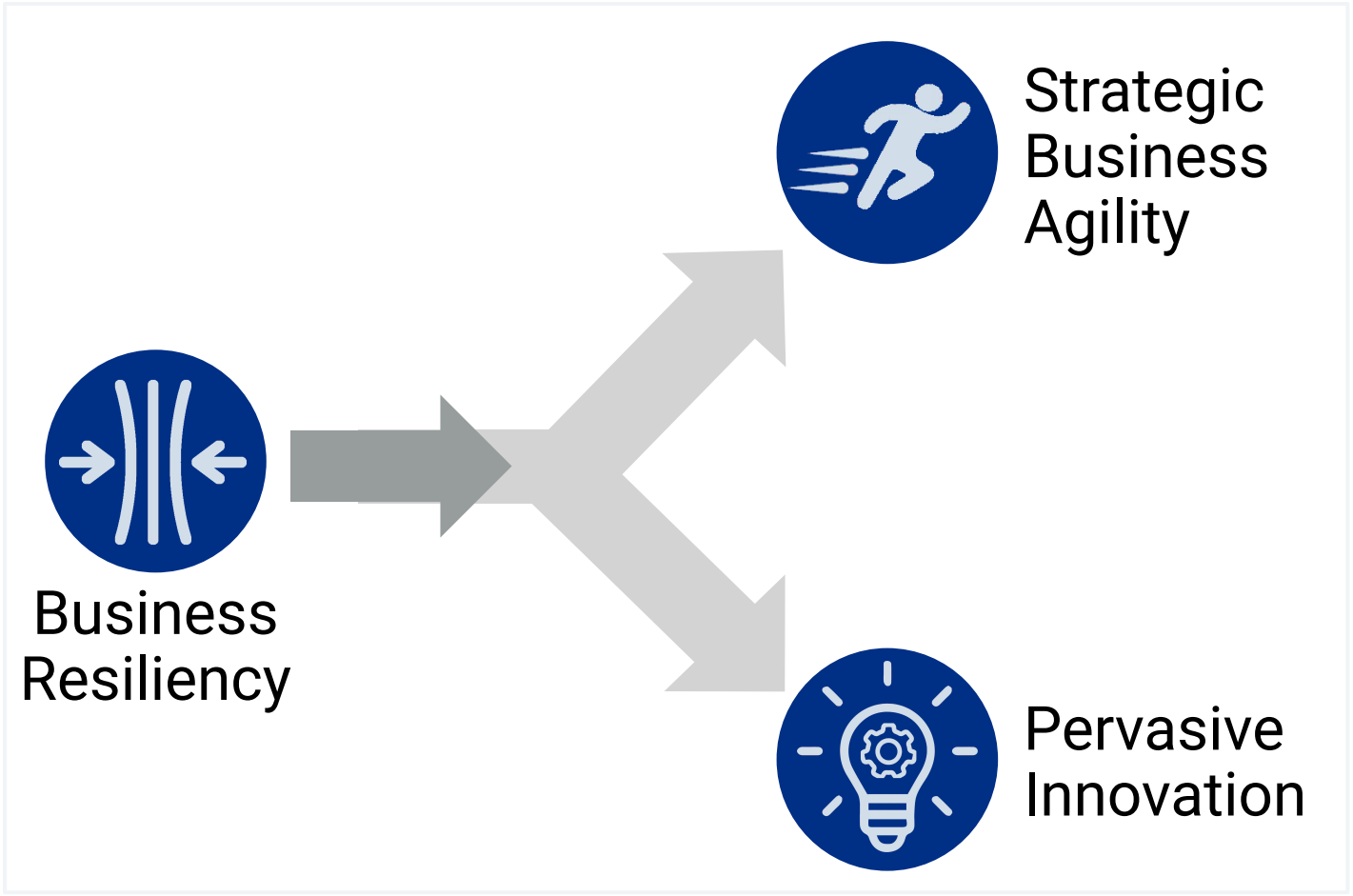
- Evolving Customer Demands
- Changing Market Competition
- New opportunities with new tech

(Notably post COVID)

Creating a need for Business Resilience:

- Business Agility
- IT Flexibility
- Rapid re-composability of Biz and Tech

Strategic Business Imperatives to Survive in the Age of Uncertainty



Composable Business Architecture

Composable Business Applications

Application Composition Technology

Strategic Technology Trends for 2022

Trend: Composable Apps

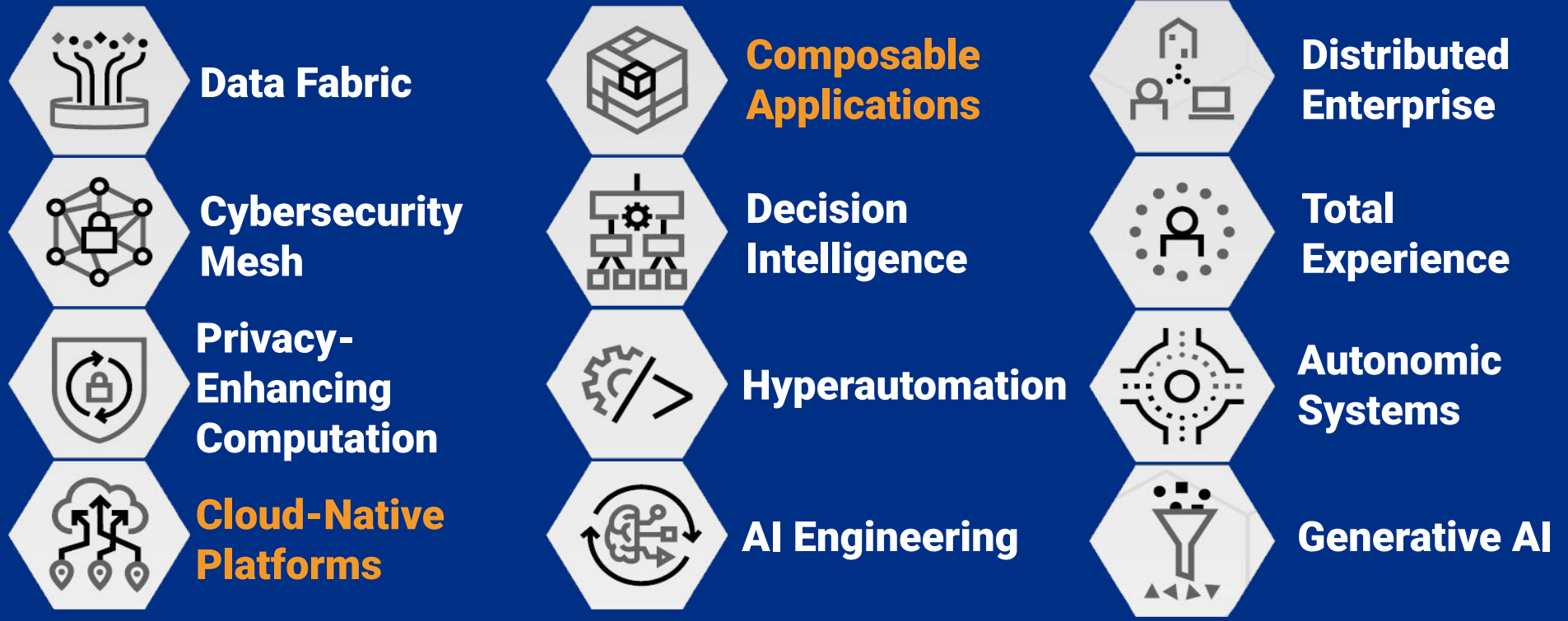
Composable apps are built from business-centric modular components and make it easier to build and reuse code, accelerating the time to market for new software solutions and streamlining security and maintenance

Trend: Cloud-native platforms

Cloud-native platforms are technologies that allow you to build new application architectures that are resilient, elastic and agile — enabling you to respond to rapid digital change.

https://www.gartner.com/en/information-technology/insights/top-technology-trends

Gartner's Top Strategic Technology Trends for 2022



The future: Composable Applications

"By 2023, organizations that have adopted a composable approach will **outpace competition by 80%** in the speed of new feature implementation."

Source: Gartner Top Strategic Technology Trends for 2021 (G00735310)

"By 2024, 70% of large and medium organizations will **include composability** in their approval criteria for new application plans."

Source: Gartner How to Design Enterprise Applications That Are Composable by Default

"By 2026 integrated application composition platform products will emerge and dominate at least 65% of new LOB application initiatives."

prediction given by Massimo Pezzini at the Gartner Application Innovation & Business Solutions Summit 2021, April 26-27

“By 2024, over 25% of government RFPs for mission-critical IT systems will require solutions architecture and variable licensing that support a composable design approach.

Source: Gartner Unveils the Top 10 Government Technology Trends for 2022

Strategic Planning Assumption

By 2024, over 25% of government RFPs for mission-critical IT systems will require solutions architecture and variable licensing that support a composable design approach.

What You Need to Know

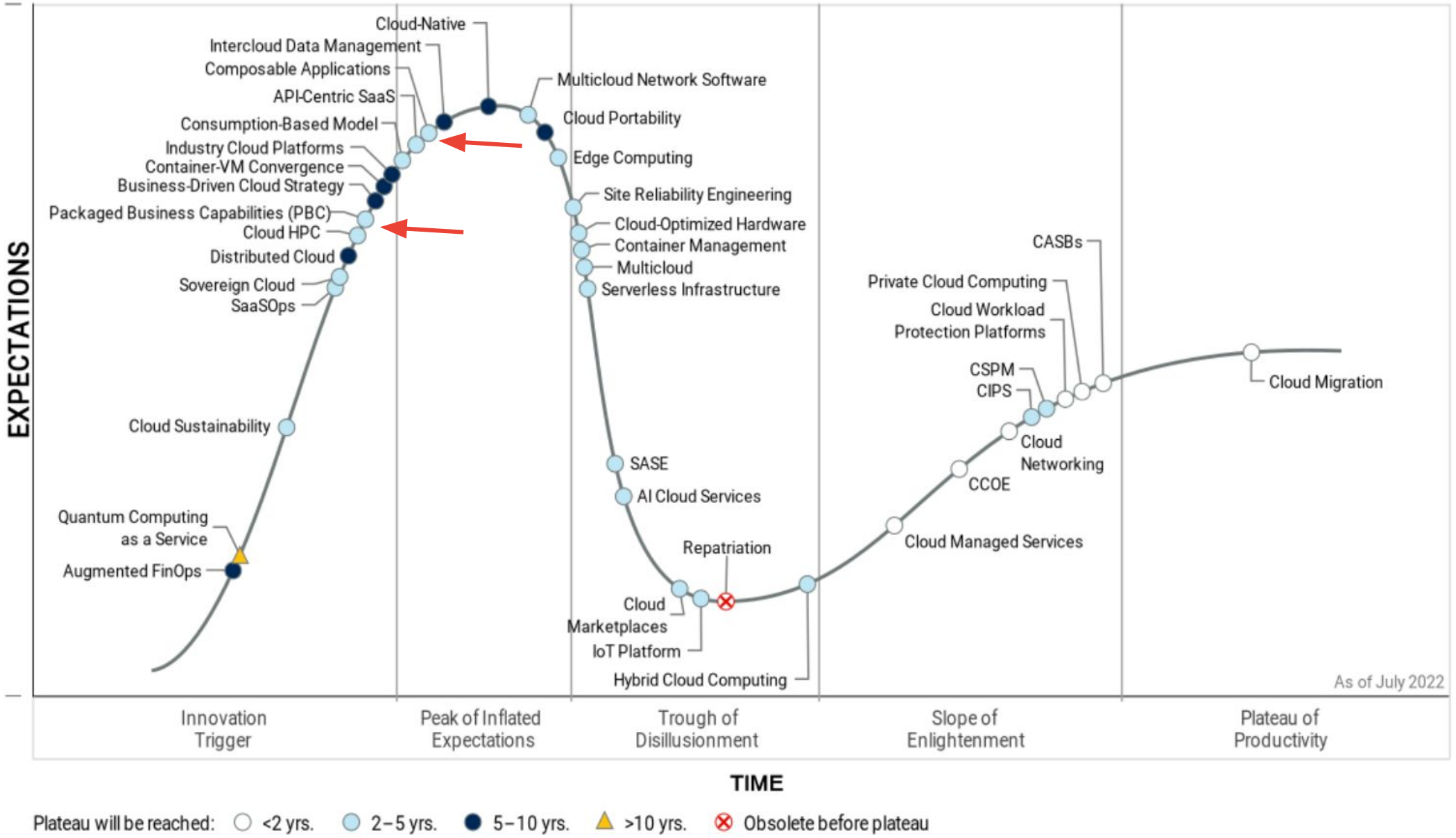
Government CIOs should look at the adoption of composable government enterprise as one of the top technology trends likely to impact their strategic plans for 2022 and beyond (see Table 1). Not doing so carries the risk of undermining the quality of government services and the capacity to deliver mission value in the future. Every technology trend interacts with wider business and executive trends that drive digital government initiatives today (see Top Business Trends in Government for 2022).

Table 1: Gartner’s Top Trends in Government for 2022

Adaptive Security	Anything as a Service (XaaS)	Hyperautomation
Digital Identity Ecosystems	Accelerated Legacy Modernization	Decision Intelligence
Total Experience	Case Management as a Service (CMaaS)	Data Sharing as a Program
	Composable Government Enterprise	

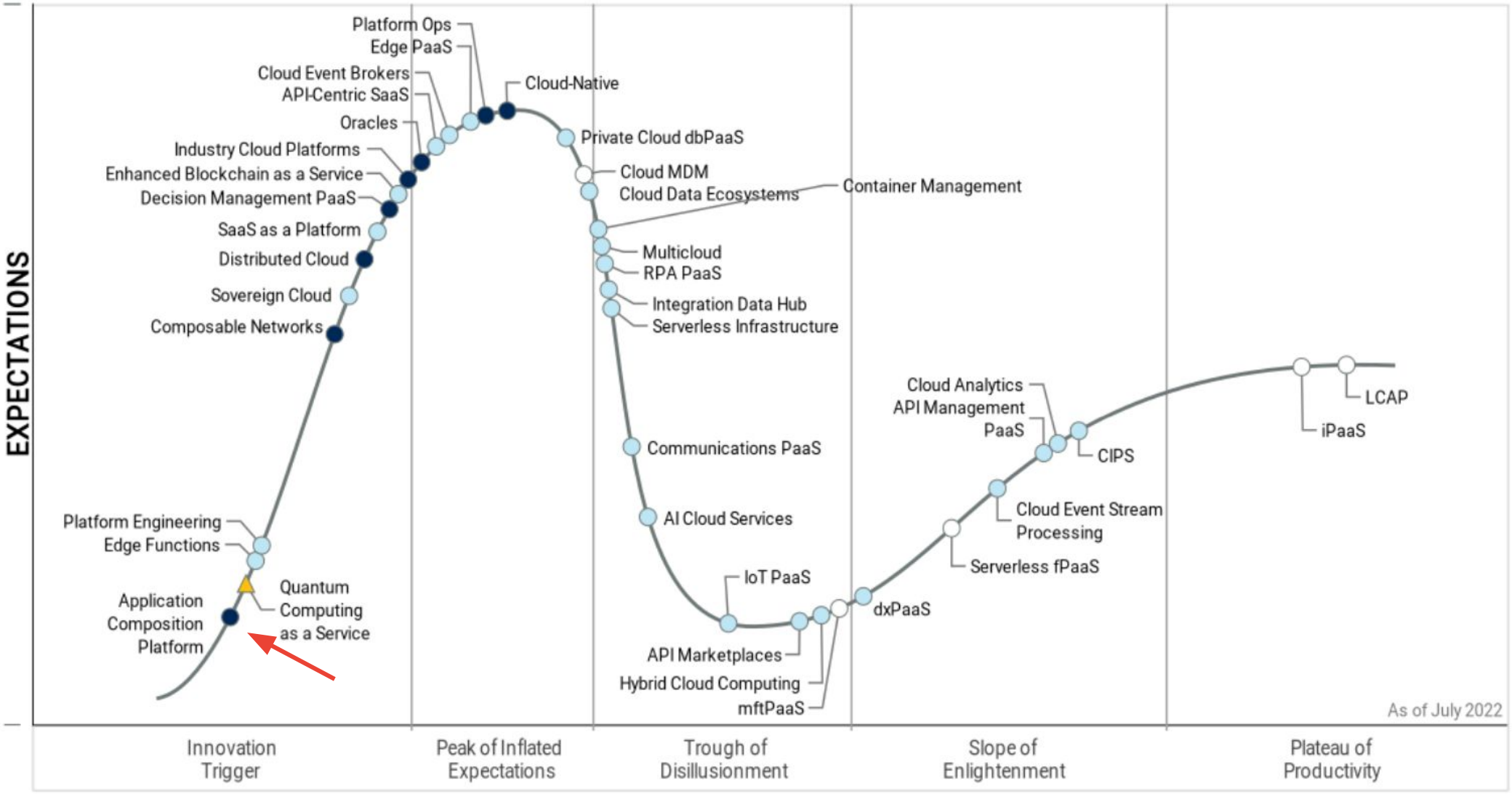
Source: Gartner

Hype Cycle for Cloud Computing, 2022



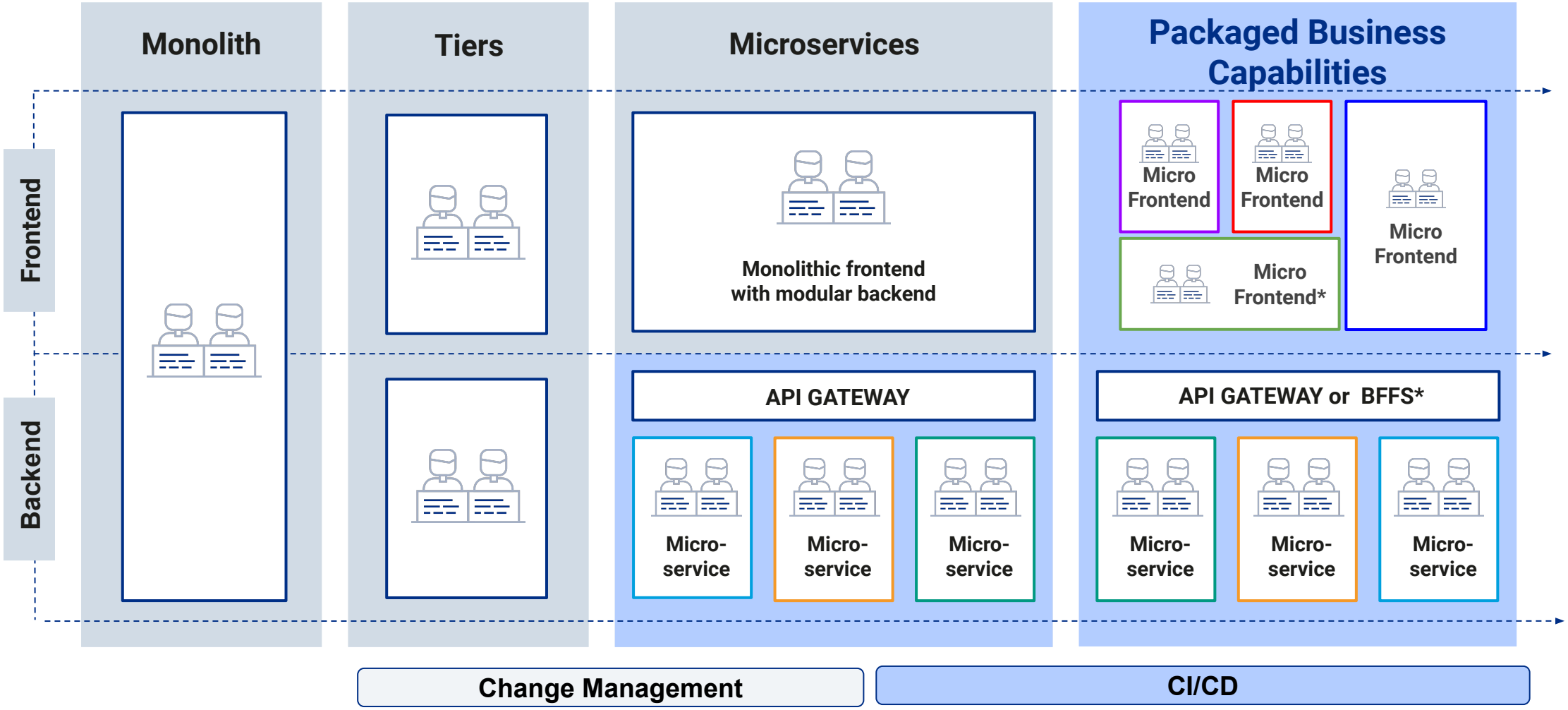
Gartner

Hype Cycle for Cloud Platform Services, 2022



Gartner

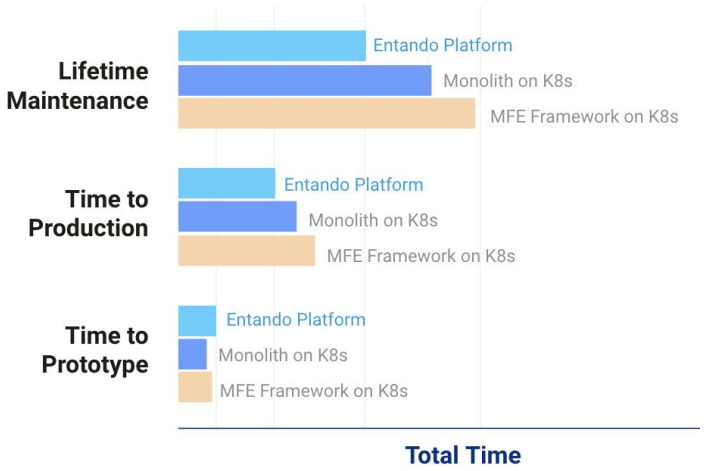
Composable Apps Require Full Modularity



As of 2020, 24% of Developers have Used Micro Frontends - 2020 State of Microservices Report

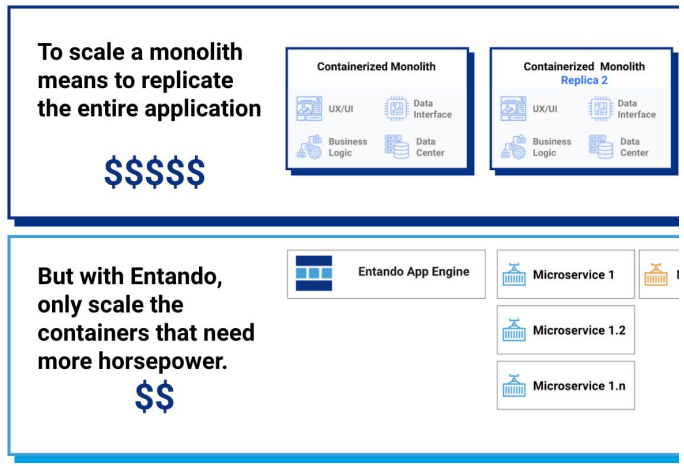
Benefits of Modularity

Accelerate App Dev



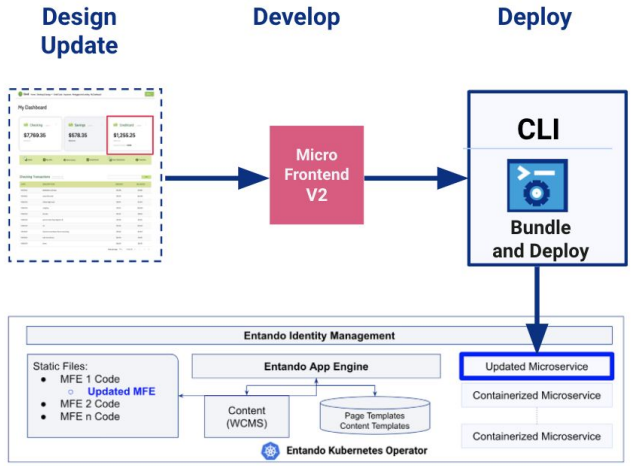
Code Reuse
Rapid updates
Bundle Templates
Team Development
Polyglot
Kubernetes Native

Lower Runtime Cost



Only scale modules needed
Modular HA
Serverless Modules
Cloud or On Prem

Streamline Maintenance

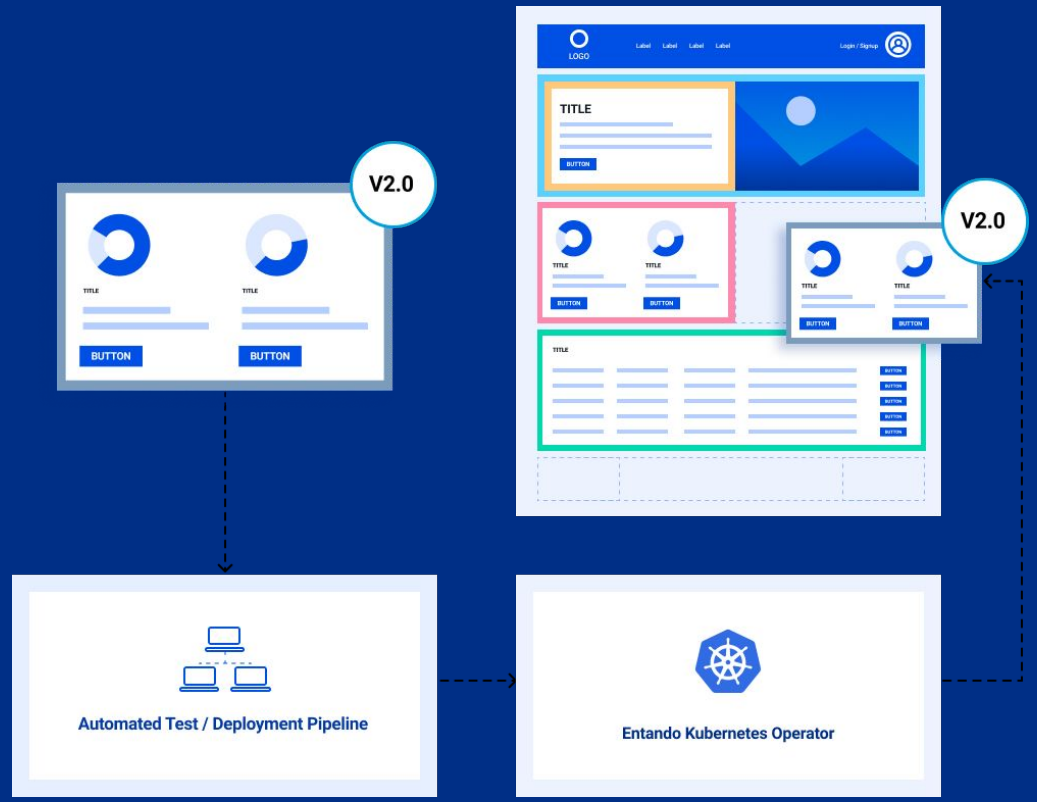


Modular isolation of problem
Start with MVPs
Modular updates
Integration with CI/CD

Composable Applications implemented using a Composability Platform

"By 2026 integrated application composition platform products will emerge and dominate at **least 65%** of new LOB application initiatives."

prediction given by Massimo Pezzini at the Gartner Application Innovation & Business Solutions Summit 2021, April 26-27



ACP: the 3rd Gen of Accelerating App Dev

Reuse Existing PBCs or Leverage as Templates

Software as a Service

- Very fast to set up
- Prebuilt service
- Fully managed
- Lowest customization
- Bring your data

SalesForce.com

Low Code / No Code

- Fast to set up
- Requires minimum coding capabilities
- Click/drag drop, script to build application
- Can integrate, can customize, but restricted

Outsystems

New: Application Composition

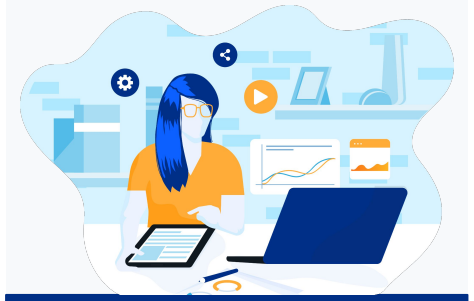
- Assemble modules
- Leverage pro-code templates
- Common Data Fabric
- Unified Business APIs
- Unified Best of Breed Stack
- Curated Library of PBCs
- Infinite customization
- Critical for innovation

entando

All 3 will be used within large enterprises for different application requirements

Application Composition Platform Dev Process

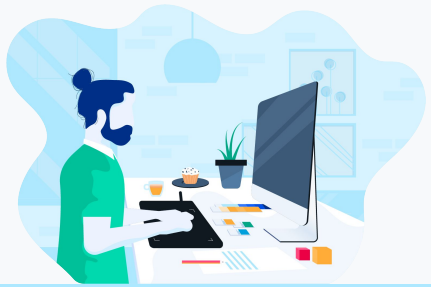
Model the Modular Business Architecture



Enterprise Architect

Selecting, implementing, and designing new applications alongside existing applications for a flexible business architecture

Design, Create the Business Modular Building Blocks



Creators

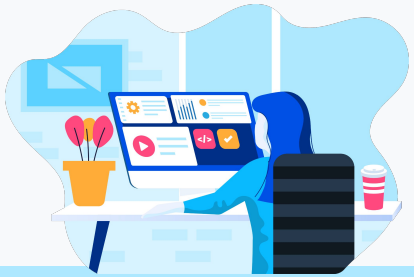
Developers use the Component Generator and CLI to build, package and deploy components to the central hub.

Manage the Marketplace of Building Blocks

Curators

Curators manage the central repository for components and business capabilities including content, versioning and metadata.

Use Building Blocks to compose Applications



Composers

Developers and Business IT use low-code application composition tools and/or UI development frameworks to assemble applications from components.

Use Applications to Achieve Business Goals

Consumers

Business owners and users have the ability to use, monitor, analyze, update content/roles/users/rules and provide feedback to Creators/ Composers.

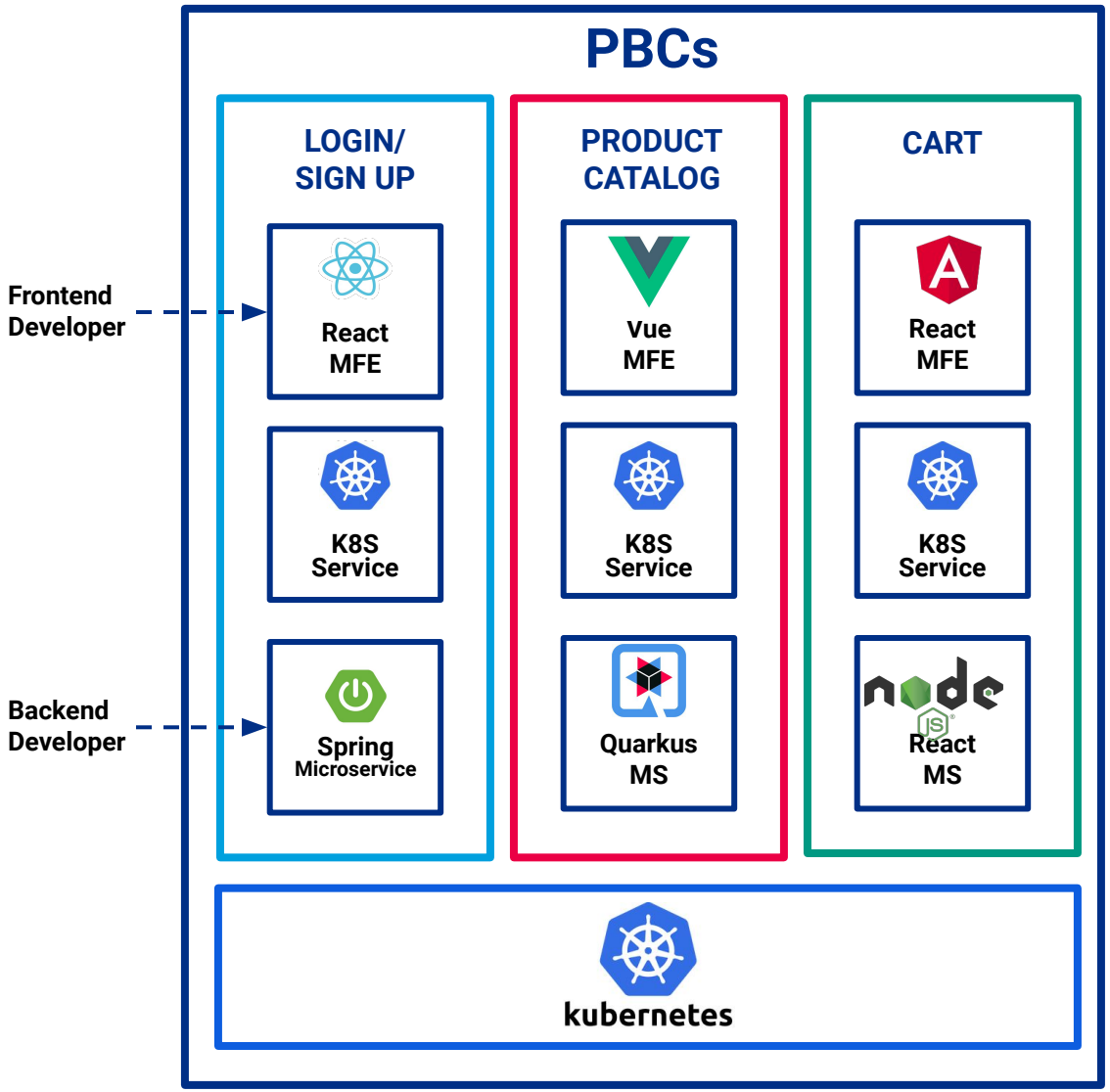
CREATE Components

Package building blocks into Packaged Business Components

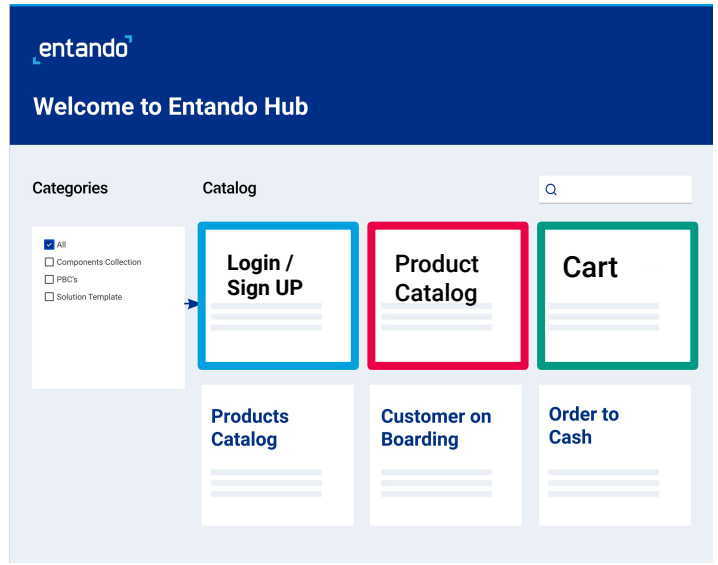
Creator

Design, Create and Package Business Capabilities

Entando Component Generator
Developers use the Component Generator and CLI to build, package and deploy components to the central hub.

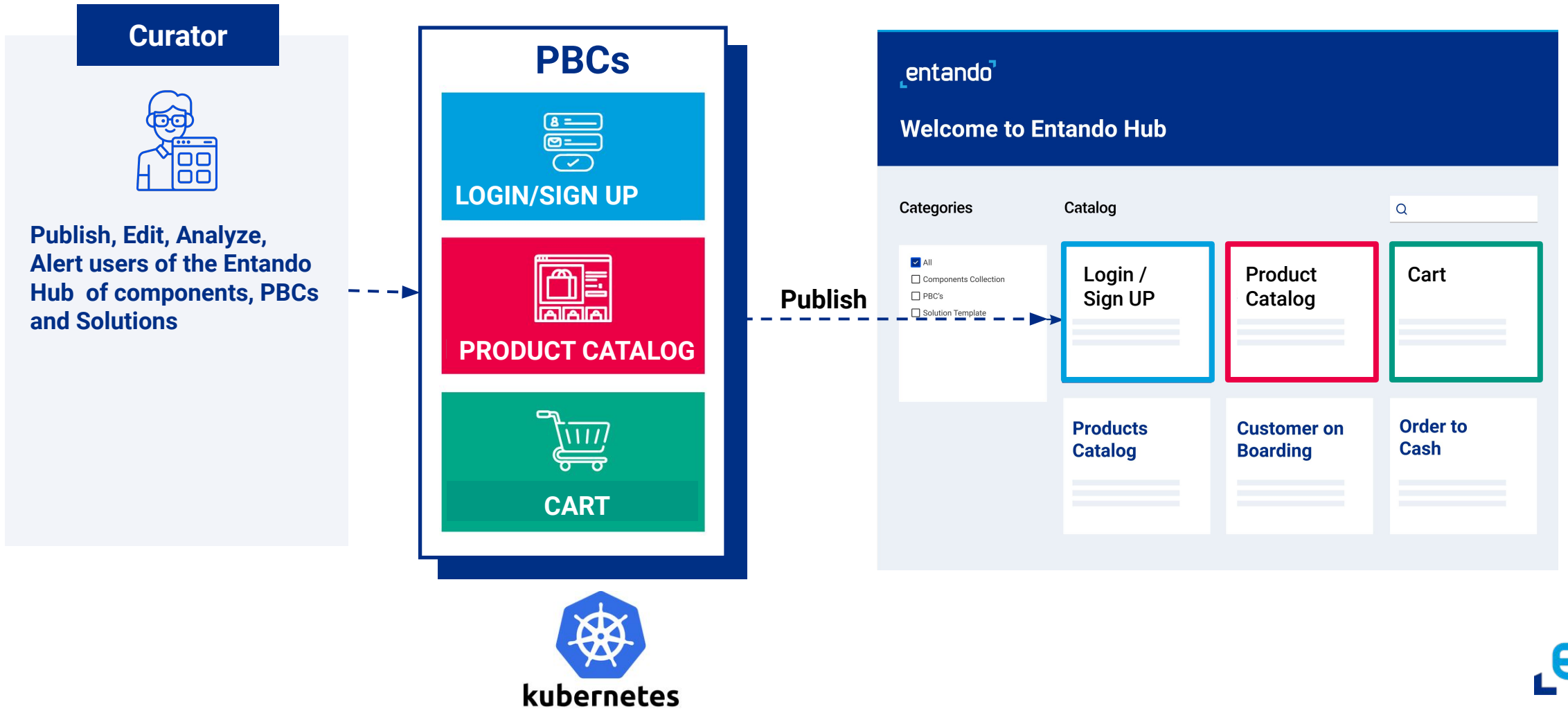


Publish



CURATE Components

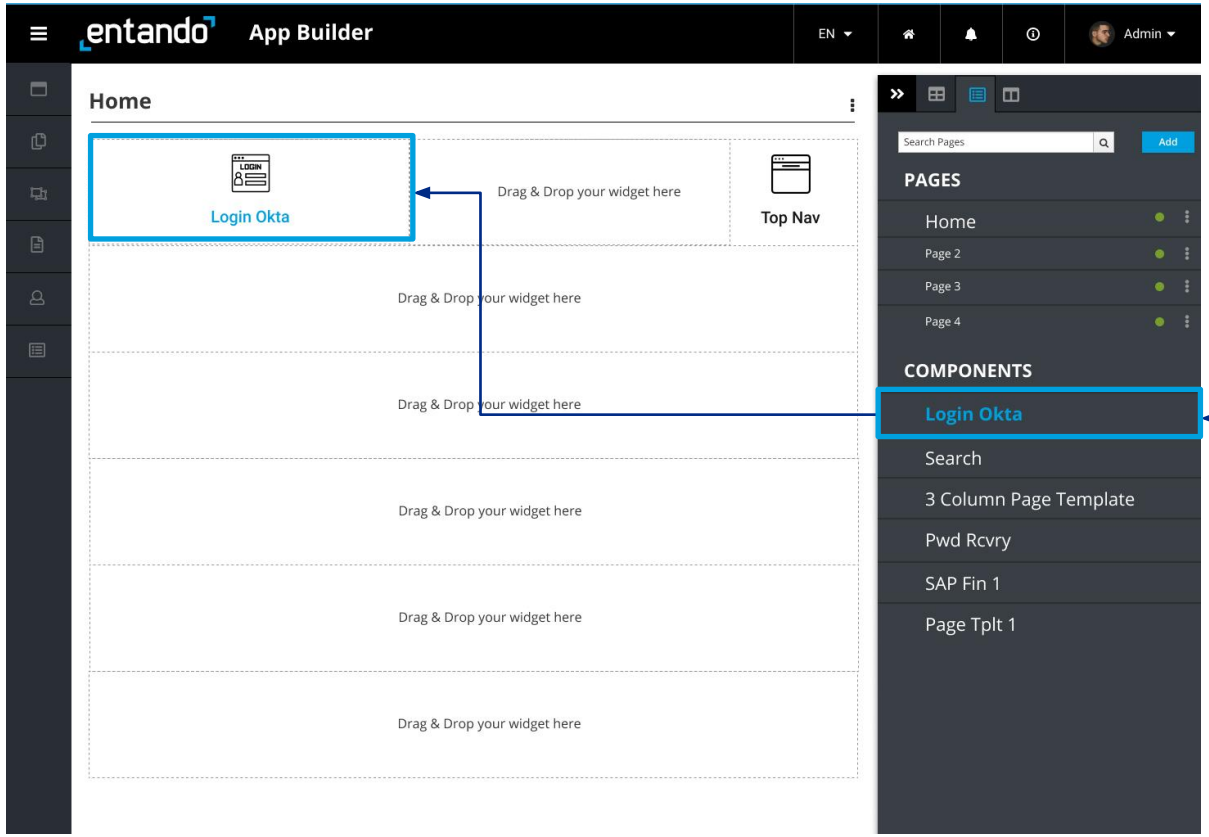
Publish components and Capabilities in the Entando Hub

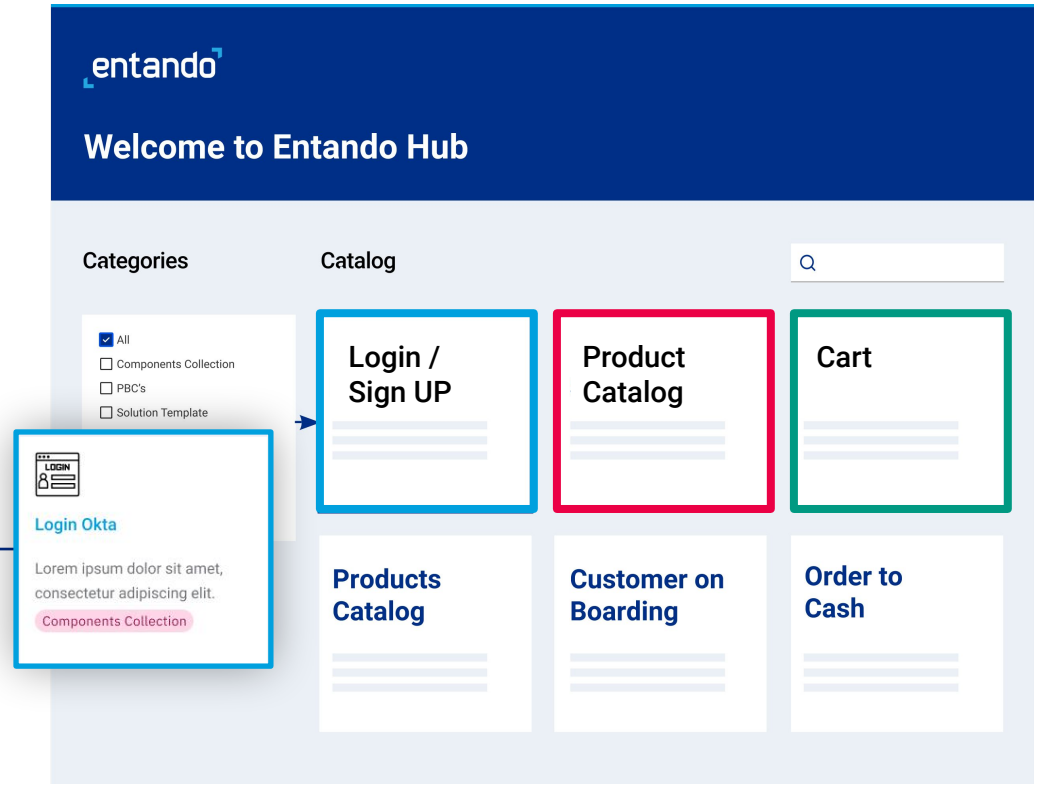


Compose Applications

Entando App Builder: Low Code tool

Compose and Recompose Apps with a low code developer tool





Compose Applications

By using PBCs from Multiple Hubs

App Builder (with a Local Hub)

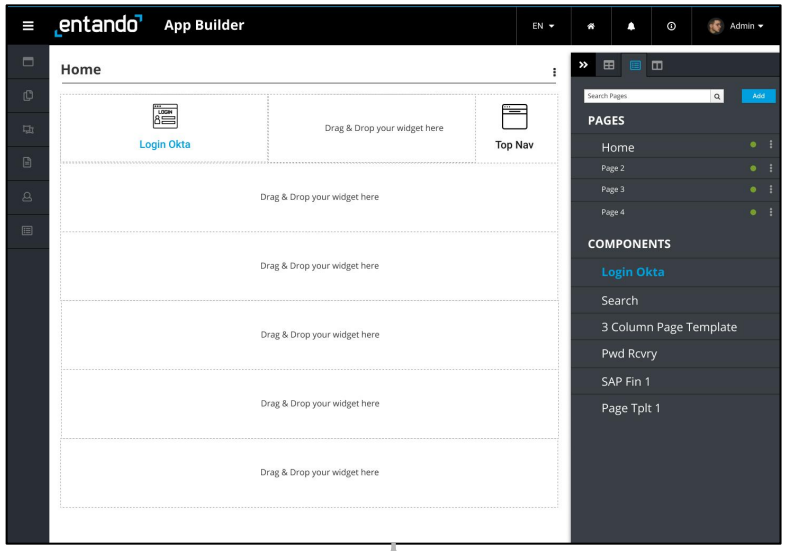
Included in the AppBuilder. Used to CREATE and compose applications from prebuilt components. Use components and PBCs as-is, configure, extend, or fork.

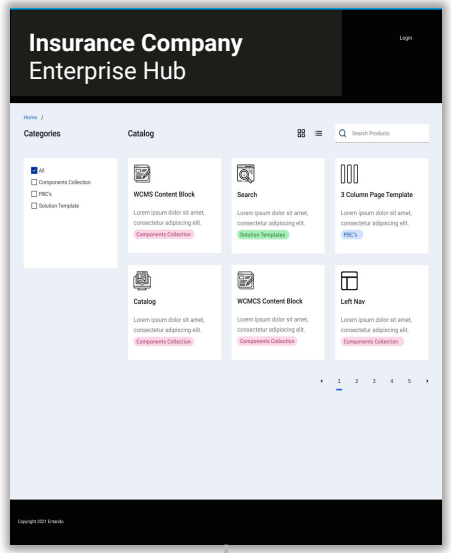
Enterprise Hubs

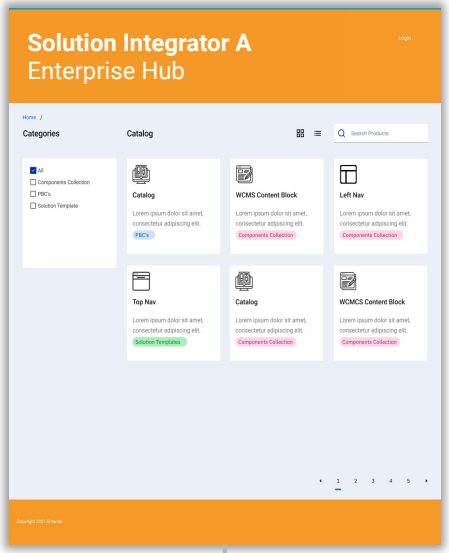
Developed and curated by either enterprises or their SI partners. Used to curate IP / PBCs / components and to control governance.

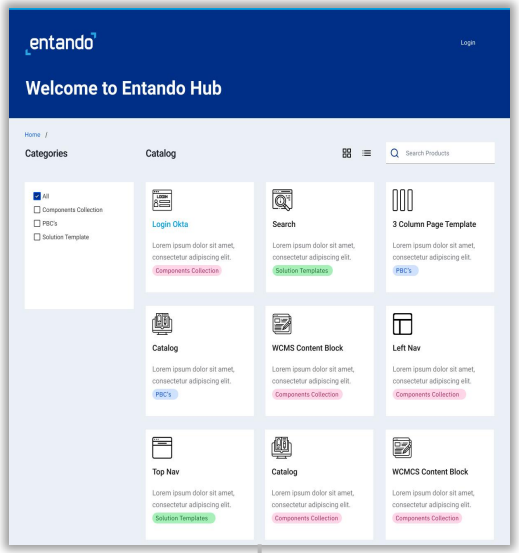
Entando Cloud Hub

Repository of public and private components and PBCs.









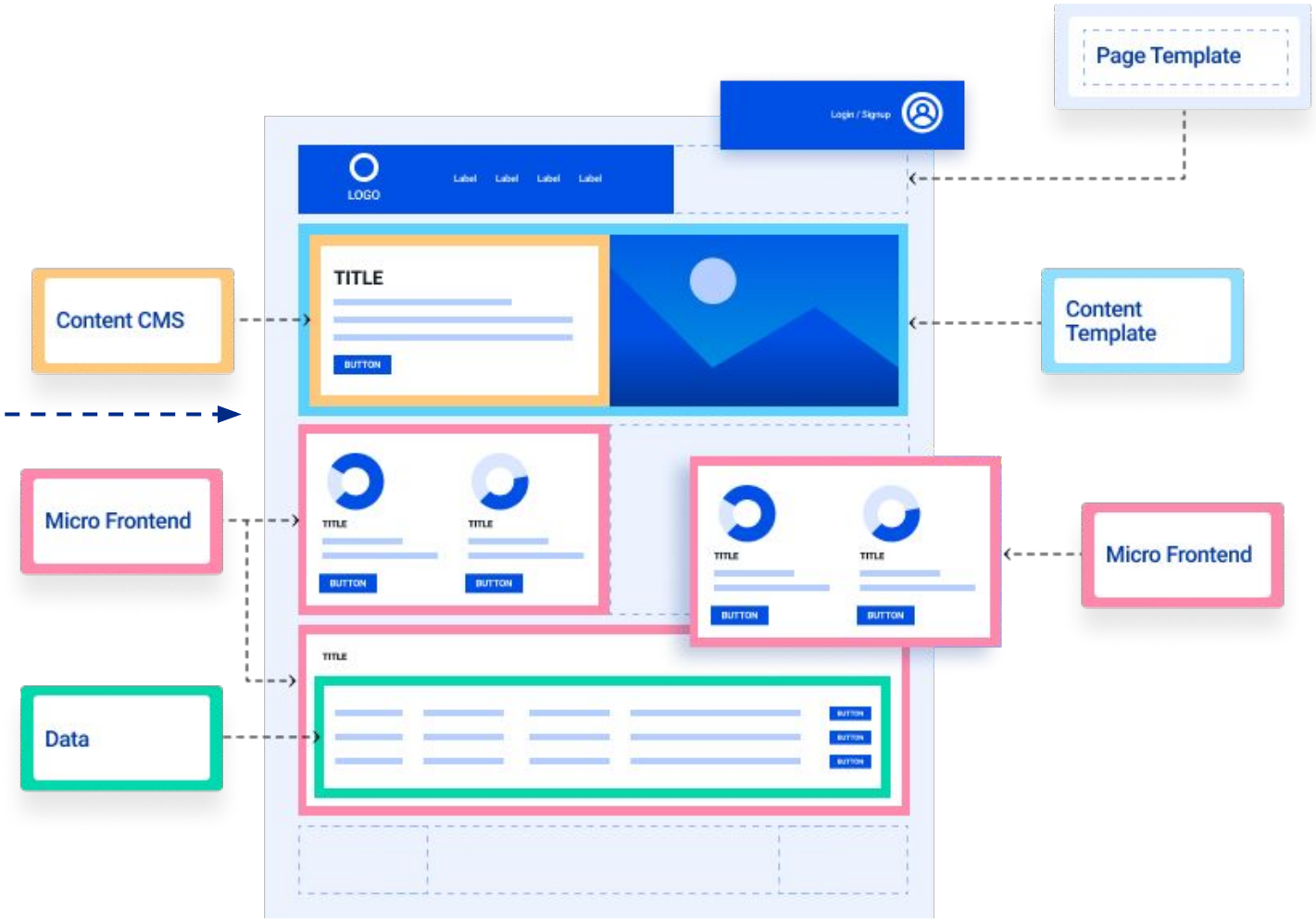
A single Entando Application Builder can leverage multiple Entando Hubs to build one or more applications

Compose Applications

By using assembling multiple PBC types

Composer

Assemble, append or update an application using the Entando App Builder. Low code to assemble components such as page templates, widgets, or full packaged business capabilities.

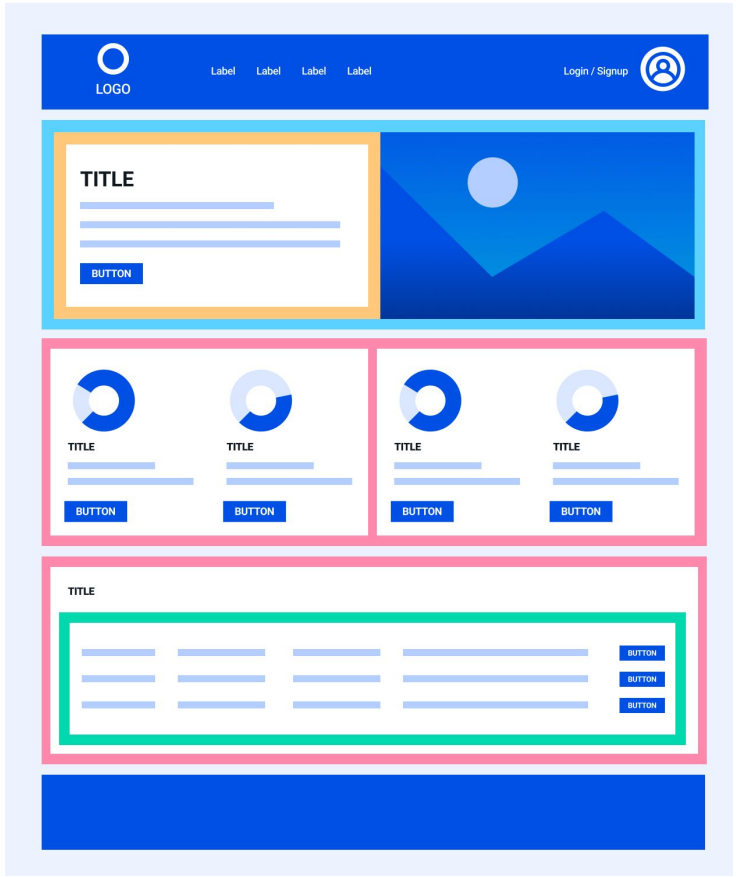


Consume Applications

Users, Administrators, Maintainers, Analysts

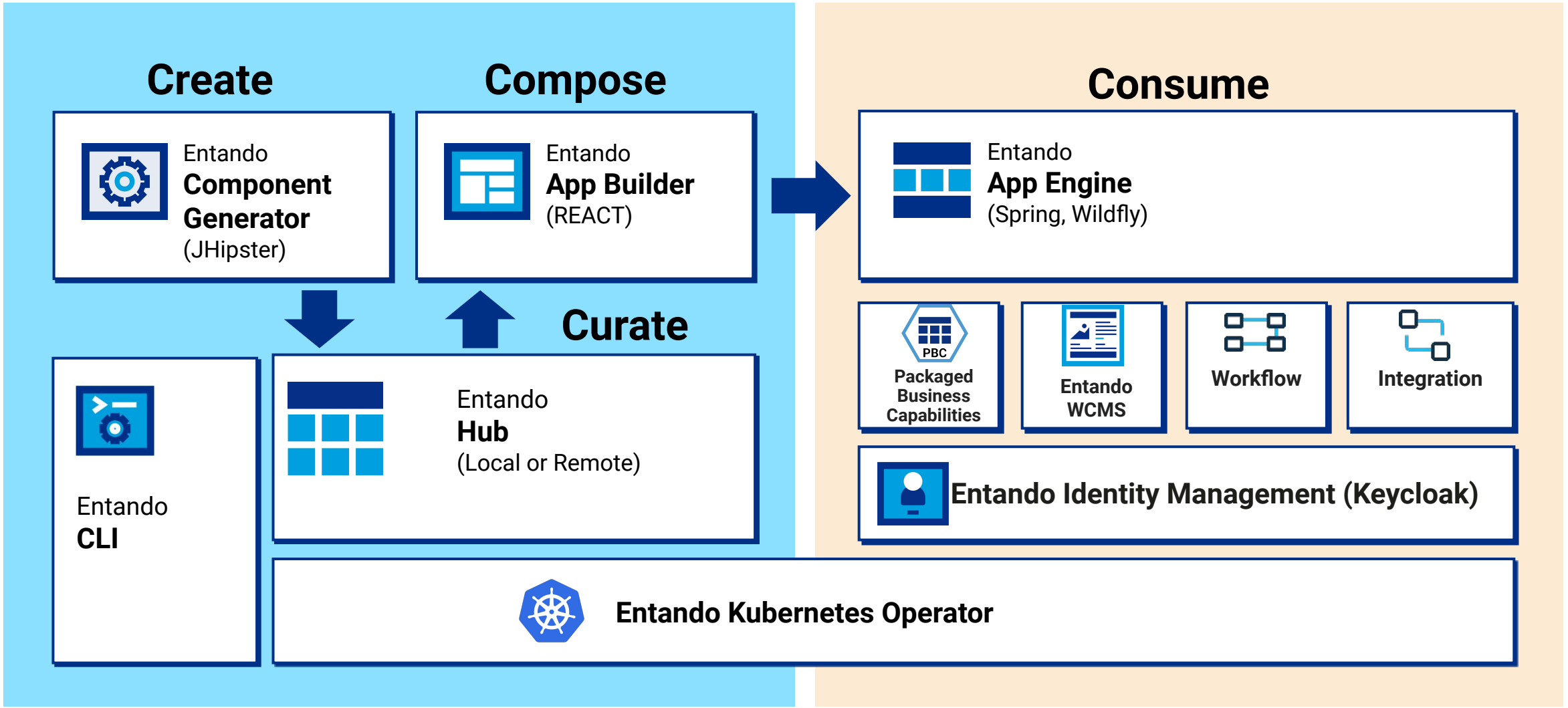
Consumer

Use / Monitor / Analyze Update (Users, Roles, WCMS, Rules, AI , etc.) Applications to Achieve Business Goals



- Create/Manage Users
- Create/Manage Roles
- Add/Edit Web Content
- Edit Rules Engine Rules
- Edit Process Mgmt
- Monitor Usage
- Analyze Performance
- Manage Updates
- Feedback to Creators and Composers

Entando for Dev and Runtime

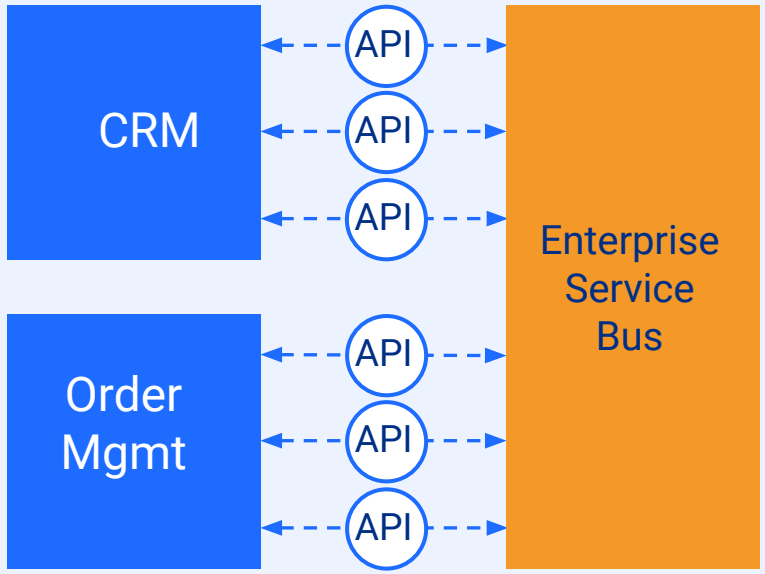


Packaged Business Capabilities (PBCs) are encapsulated software components that represent a well-defined business capability, recognizable as such by a business user and packaged for programmatic access.

Create: Solutions / Templates / Biz Modules

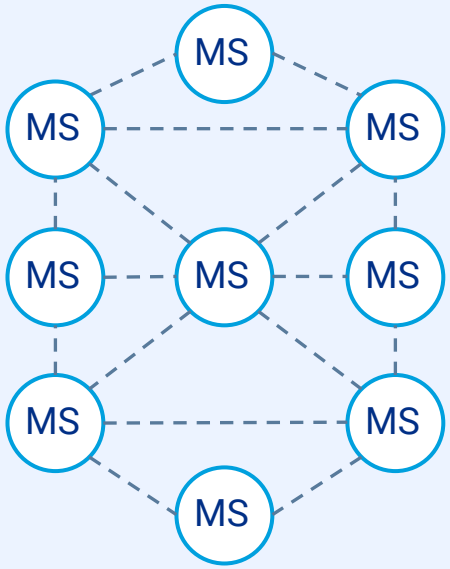
From Monolith to Fully Modular

2000's ---------- 2010's ---------- 2020's



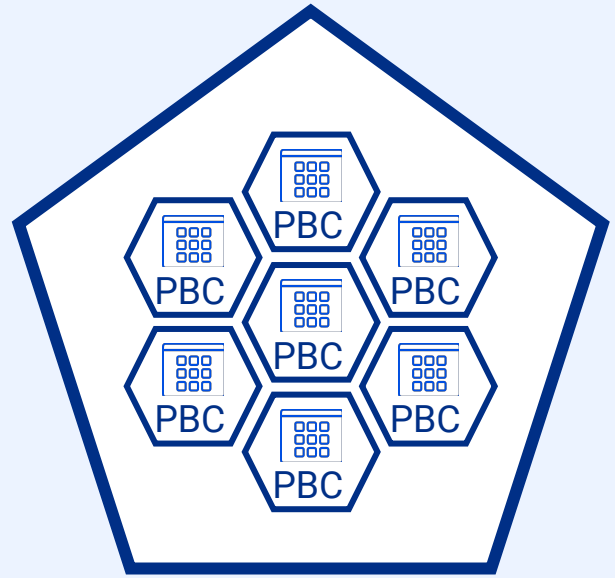
Packaged Monolithic Applications

Easy to manage, Hard to change



Packaged Microservice-based Applications

Hard to manage, Easy to change



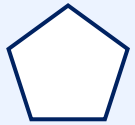
Composed Applications

(PBCs & Components Marketplace)

Easy to manage, Easy to change

Packaged Business Capabilities

Conventional/Monolith Application



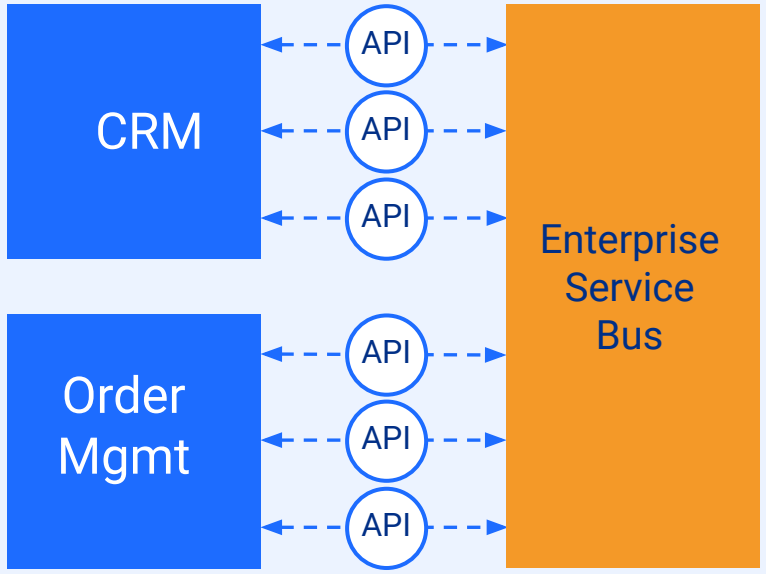
Composed Application

Microservice

API

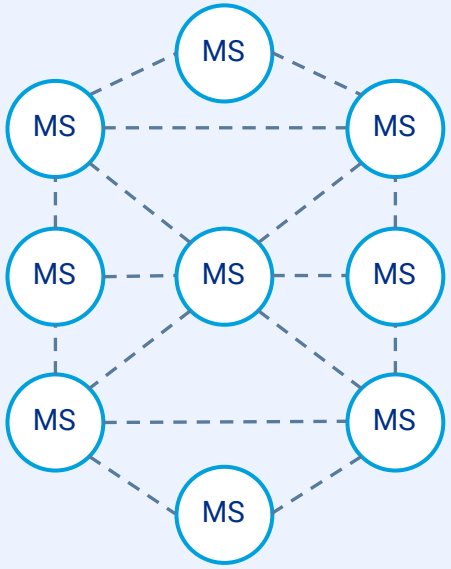
Modularity Components & Packaged Business Capabilities

2000's ⟶ 2010's ⟶ 2020's



Packaged Monolithic Applications

Easy to manage, Hard to change



Packaged Microservice-based Applications

Hard to manage, Easy to change

Composed Applications

Easy to manage, Easy to change

PBC — Packaged Business Capabilities

Conventional/Monolith Application

Composed Application

MS — Microservice

API — API

What is an Application Composition Platform?

a development platform that supports:

A catalog of composable, packaged software components

Creation and cataloging of packaged software components

Democratized development and deployment of applications

governance of the life cycle of cataloged packages and the resulting composed applications

What is a Composable Business Application?

An orchestrated assembly of independently deployable business capabilities.

Orchestrated assembly

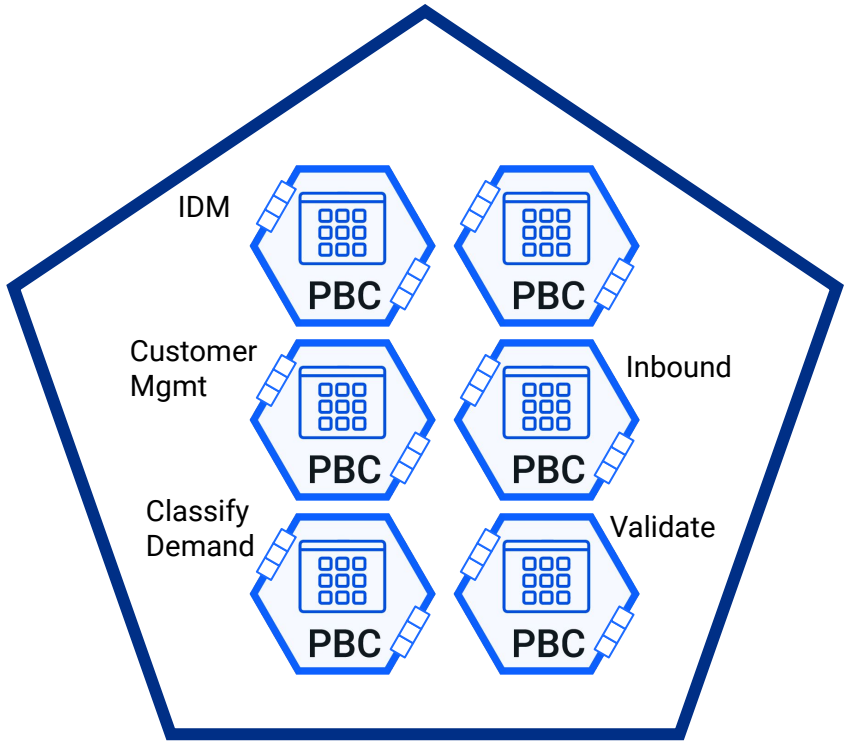
Independently deployable **business** capabilities (“PBCs”)

Multiple, custom experiences

Modifiable via recomposition

Created to meet a specific business need

Packaged Business Capabilities



Example PBCs for CRM

Packaged business capabilities (PBCs) are encapsulated software components that represent a well-defined business capability, recogn as such by a business user and packaged for programmatic access.

Customer Management

- Identify Customer
- Manage Customer
- Manage Customer Hierarchy
- .....

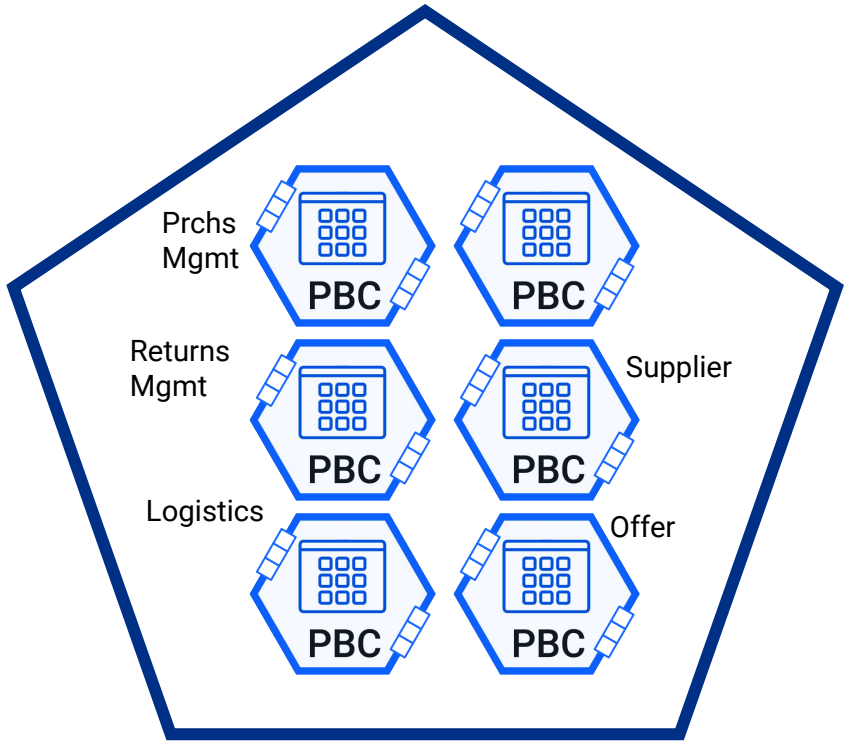
Contact Management

- Outbound Contact
- Inbound Contact
- Classify demand
- .....

Order Management

- Validate Order
- Track Order
- Cancel Order
-

Packaged Business Capabilities



Example PBCs for Procurement & Logistics

Purchasing

- Manage Purchase requirement
- Purchase Order Management
- Catalog Management

Logistic Mgmt

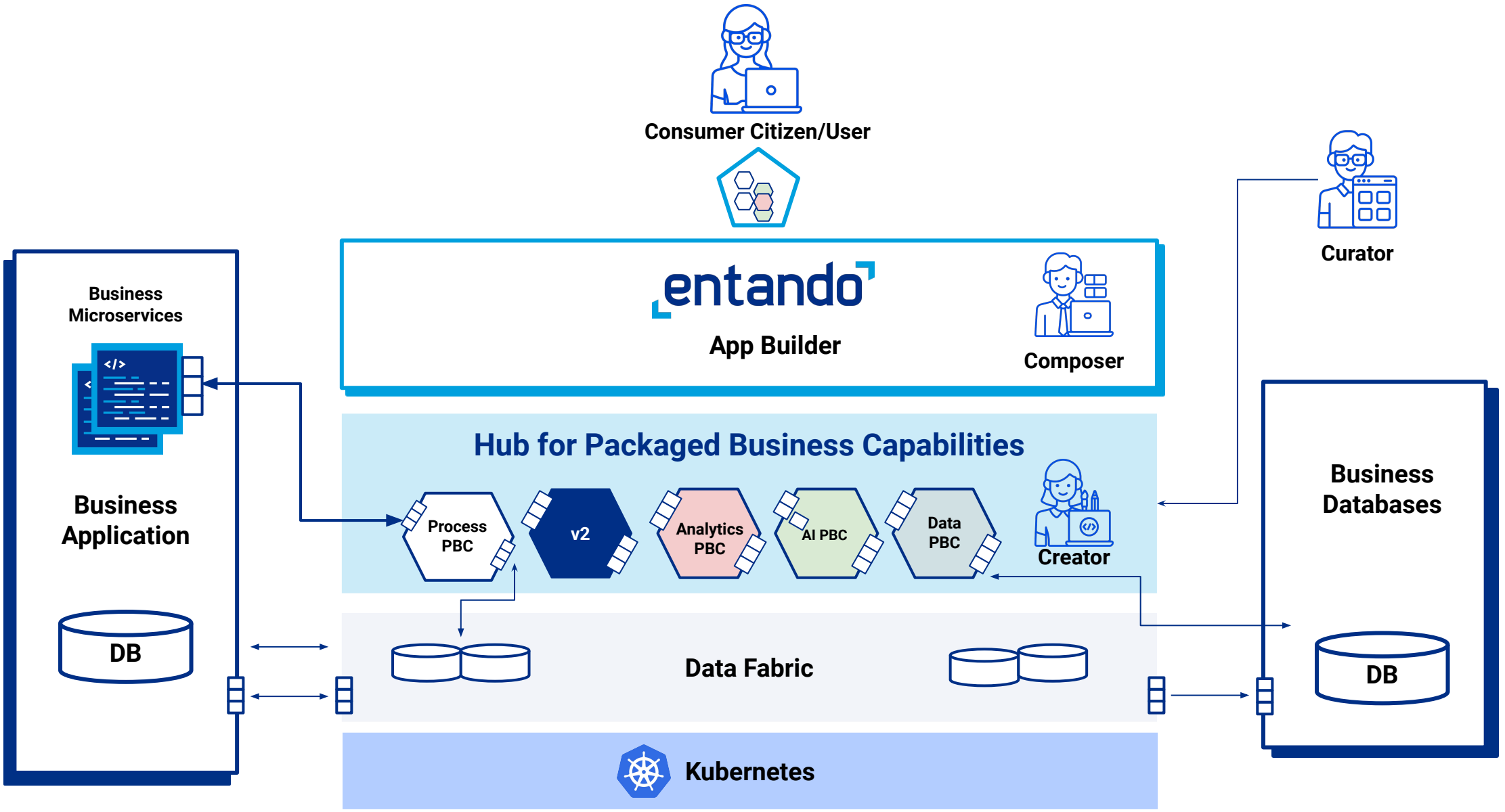
- Manage Returns
- Manage Logistic
- Order Management Transportation
- Manage Demand Forecast

Supplier Contact Mgmt

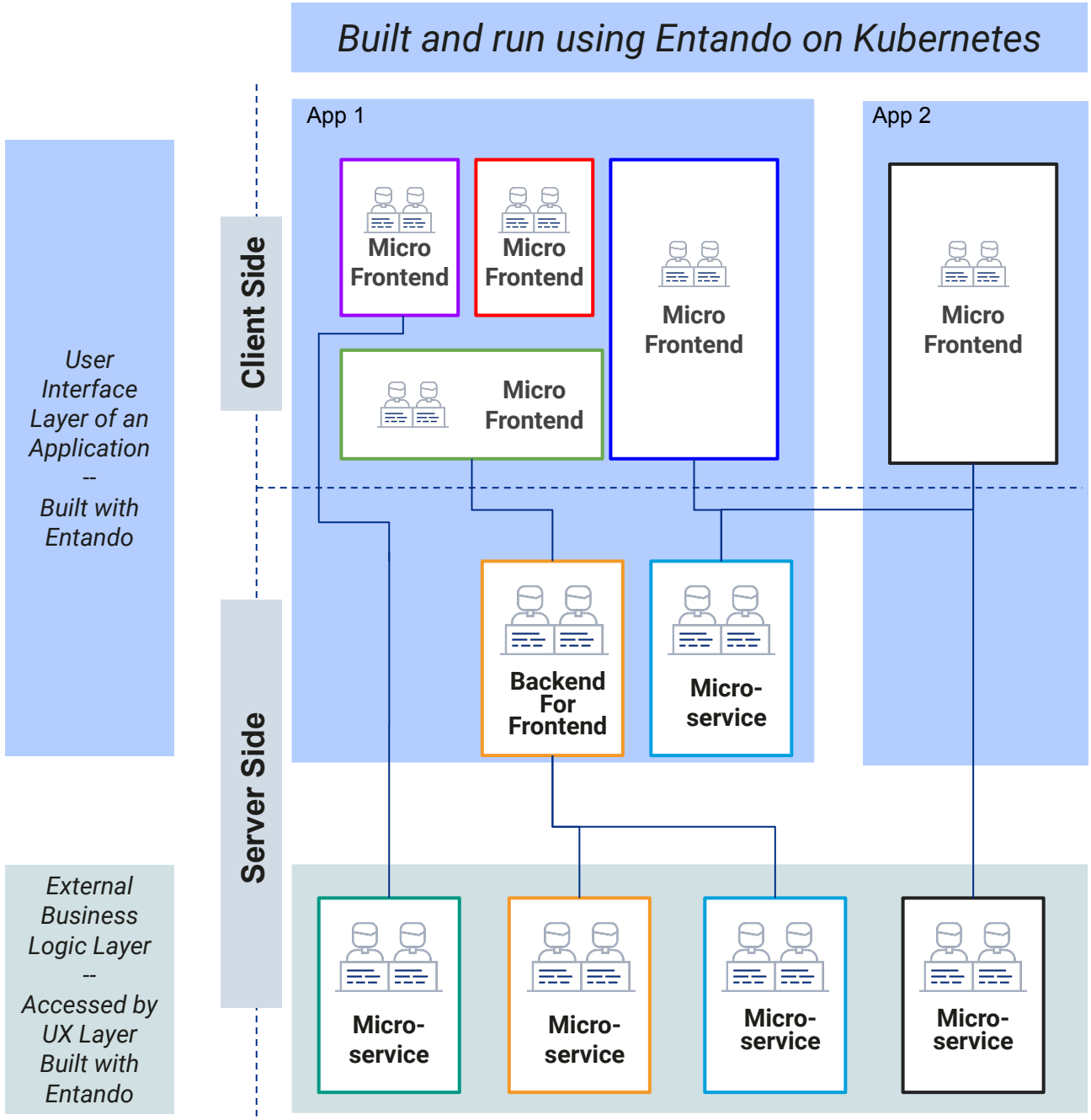
- Manage Supplier Collaboration
- Manage Supplier Registration
- Classify Supplier offer
- Manage supplier Contact Routing

……..

Ref Architecture for App Composition

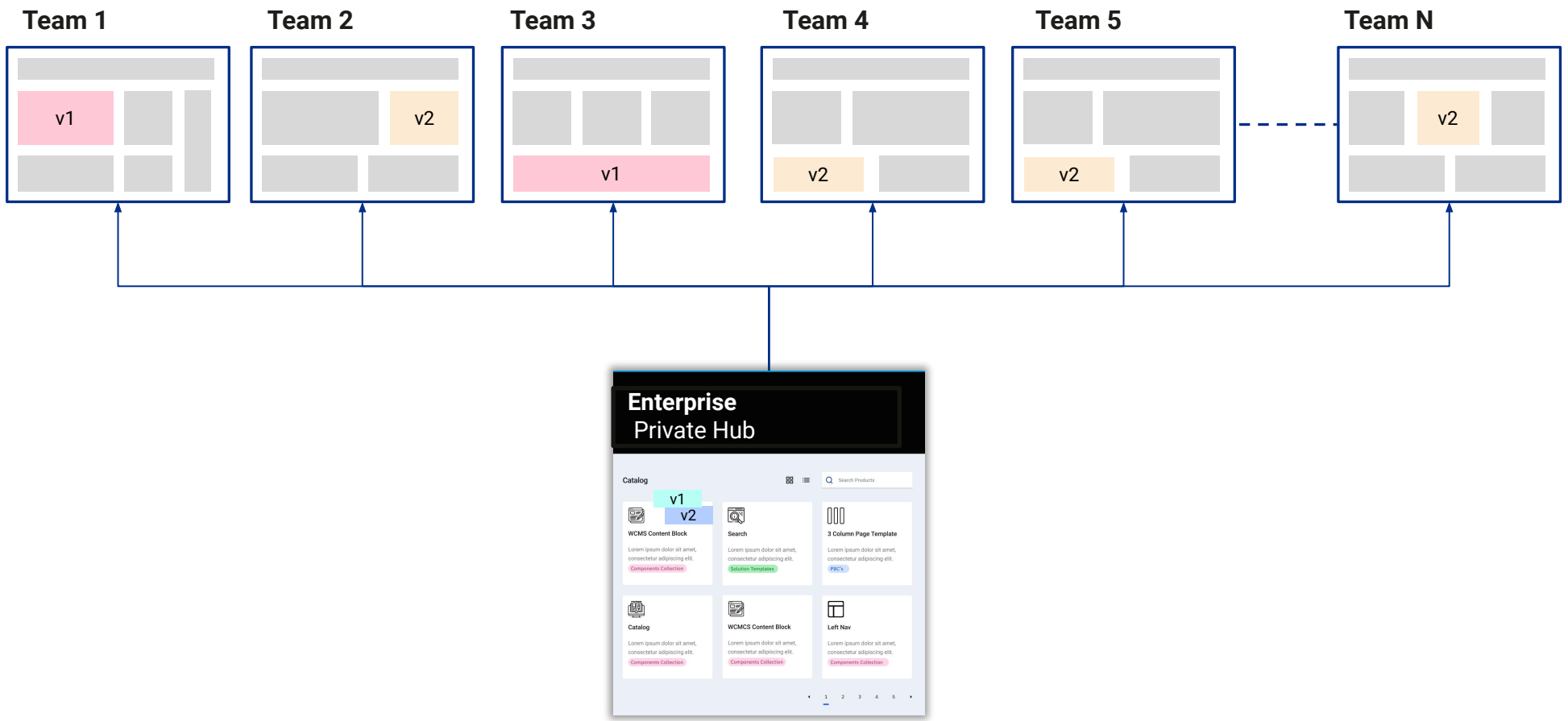


Integration Patterns



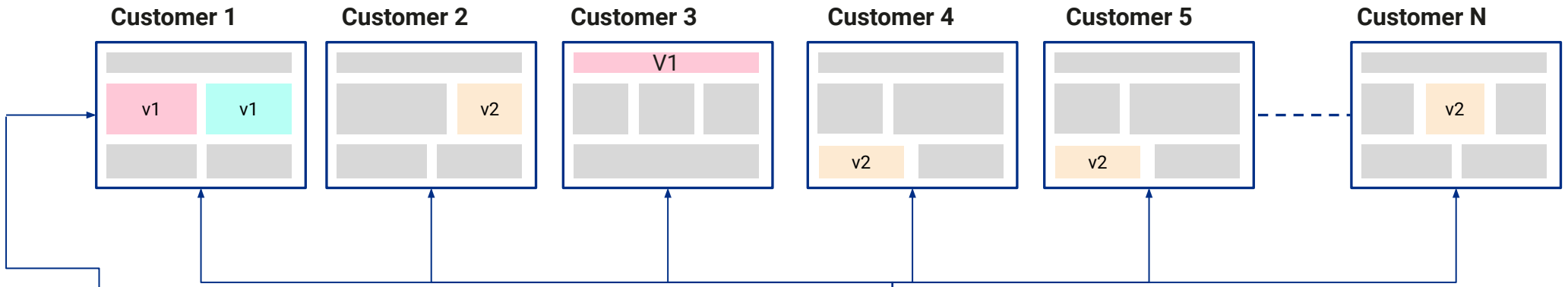
Enforce Governance - Ensure Quality

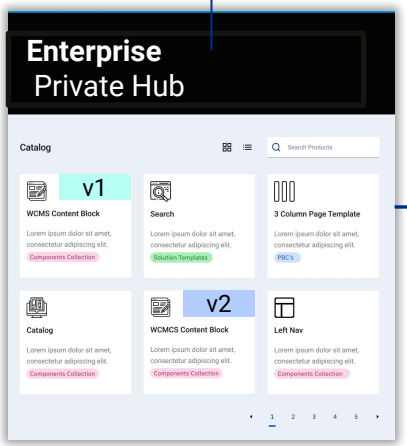
Reuse, Maintenance Across Multiple Developer Teams



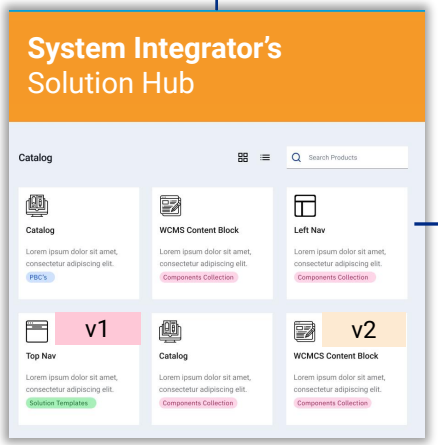
Build from Public, Private, or SI Hub

Code Reuse and Maintenance Across Multiple Customers





A specific customer app can include PBC's/Components from multiple hubs:
- The public Entando Hub
- An SI's private Hub
- Their Enterprise's private Hub



SI's develop a proprietary catalog of PBC's

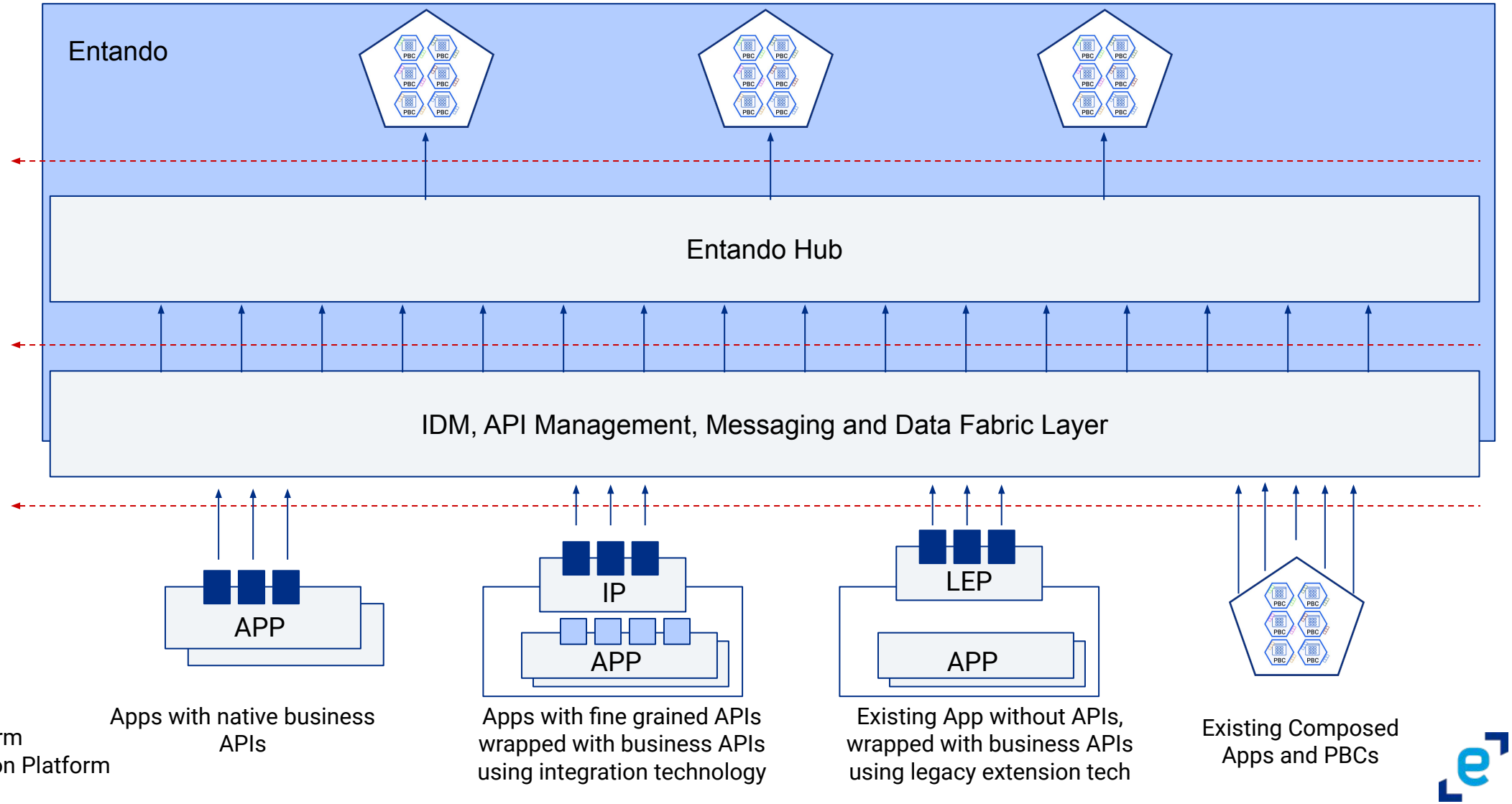
PBC's stored in Entando Hub (public or private)

Reuse PBC's across multiple customers/apps

Simplify maintenance and feature evolution across customers. Only update one source PBC

Updates are published to Hub and rolled out individually based on customer's approval / timelines

Implementing Composable with Existing Apps



Entando App Builder
Compose or Recompose Business Applications

Entando Component Generator and CLI
Create, Configure, Extend, Fork PBCs and EPCs

Data / Access Fabric
Register APIs, Define a Data Fabric, Implement IdM

Business API

Fine Grained API

IP: Integration Platform
LEP: Legacy Extension Platform

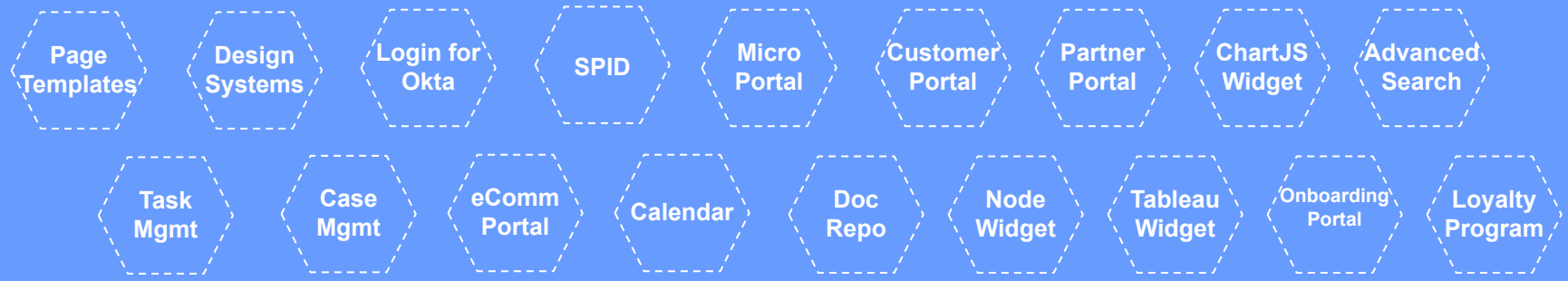
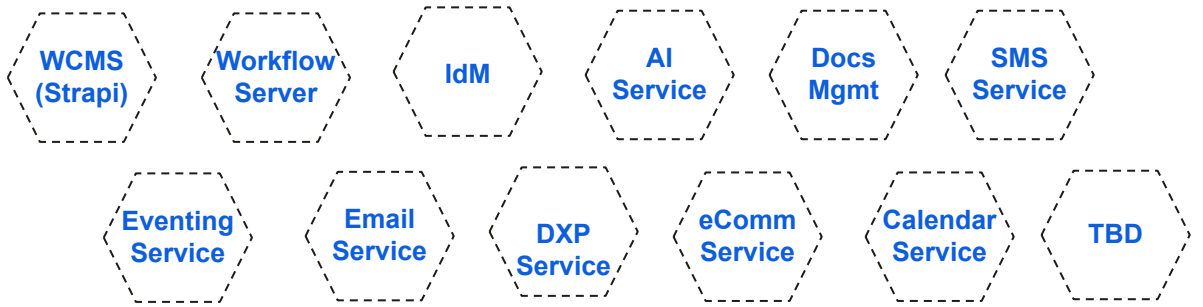
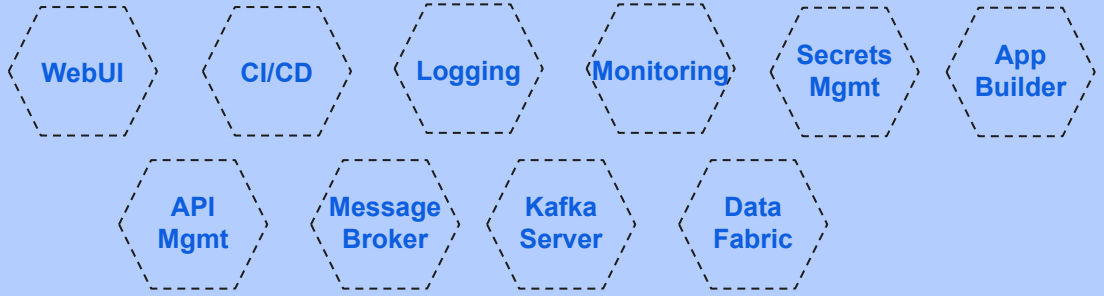
Apps with native business APIs

Apps with fine grained APIs wrapped with business APIs using integration technology

Existing App without APIs, wrapped with business APIs using legacy extension tech

Existing Composed Apps and PBCs

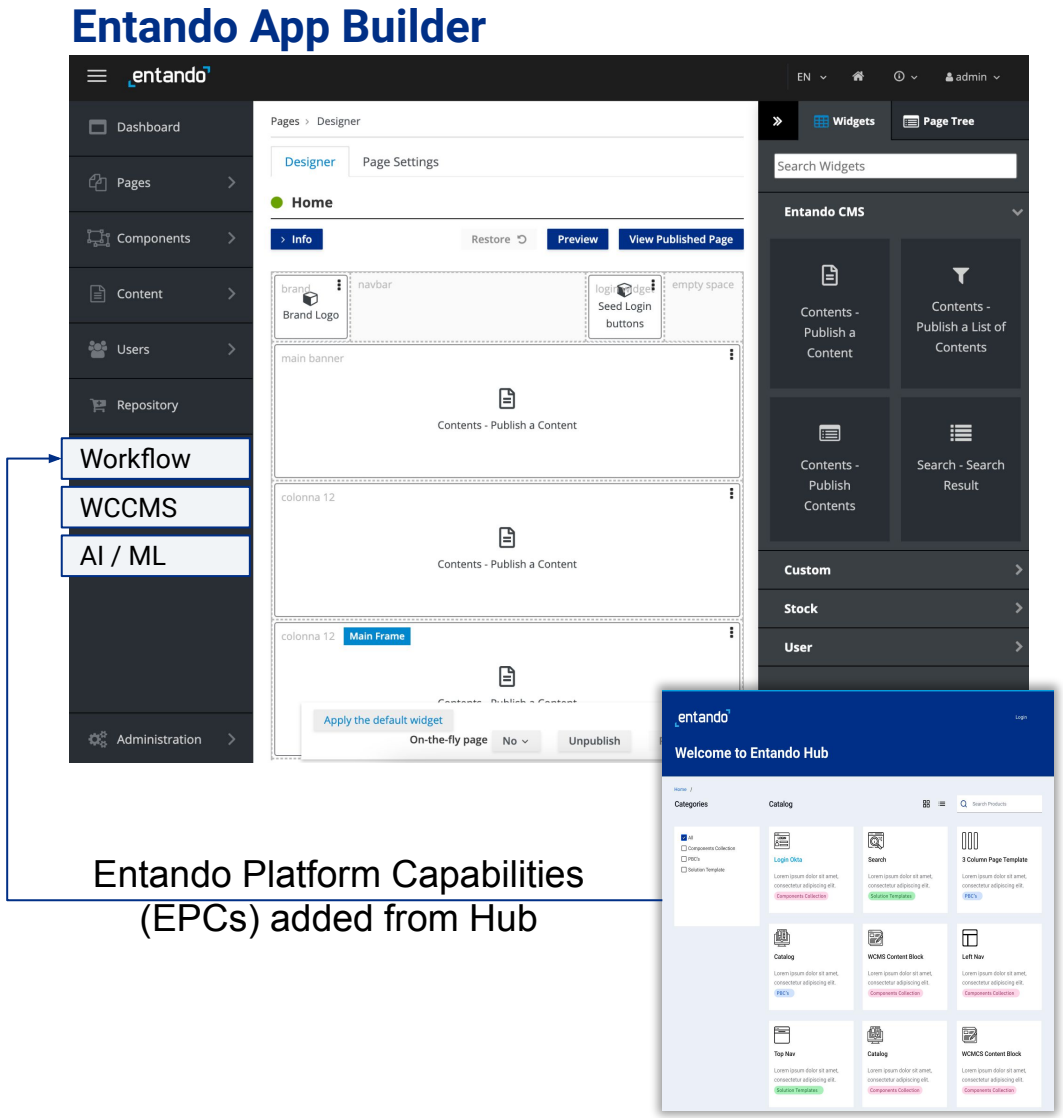
Entando Cloud Hub Examples

PBCs, aka, Components, Accelerators, and Solutions (Entando, SI, ISV, Community Components)	
Functional EPCs (ISV Integrations)	
System EPCs (Entando and ISV Integrations)	

Extending the Entando App Builder with EPC

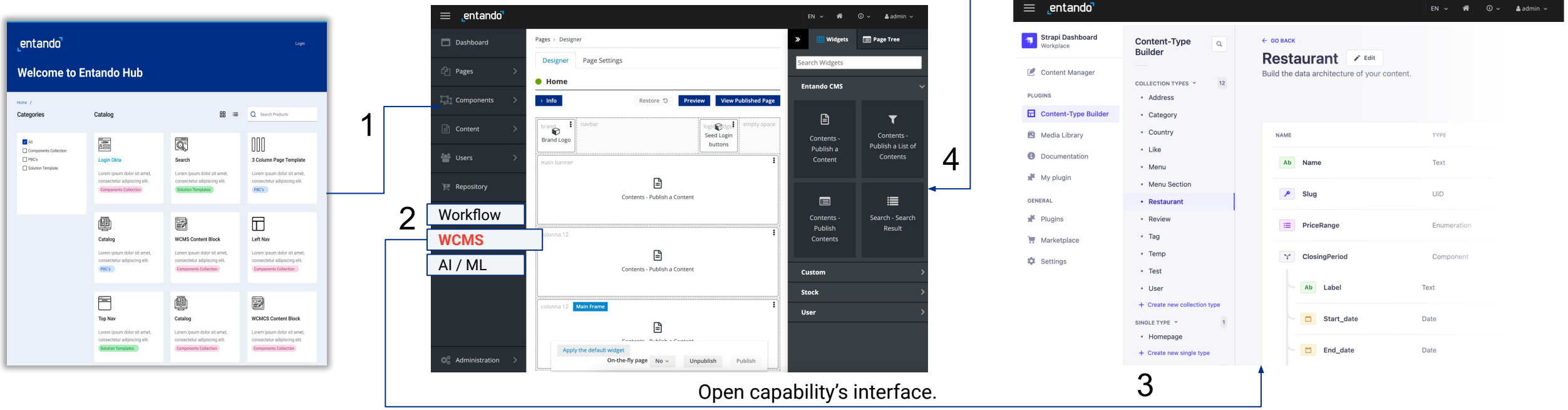
EPC: Entando Platform Capability

- Add additional low code capabilities
- Added as Functional Entando Platform Capabilities
- or as System Entando Platform Capabilities
- Leverage capabilities in your stack
- Extend to one or more headless capabilities
- EPCs can be app specific
- Functional EPC (Headless) examples
  - WCMS (e.g., Strapi)
  - API Managment (e.g., Apiman)
  - Workflow (e.g., jBPM)
  - Rules Mgmt (e.g., Drools)
  - K8s Namespace Monitoring
  - AI/ML (e.g., Azure Open AI)



Strapi.io EPC Integration Overview

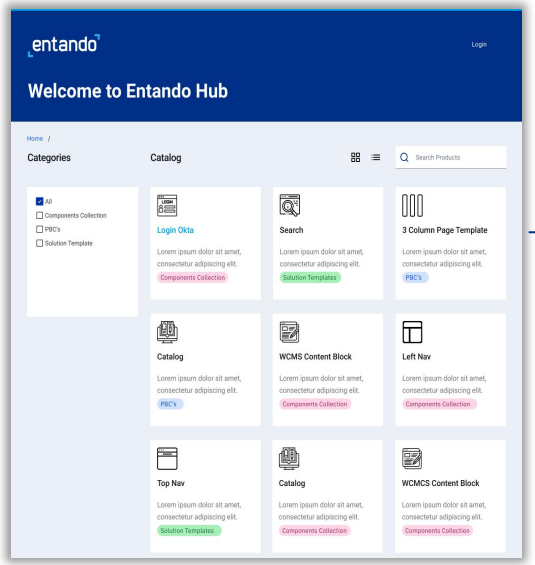
Add Entando Platform Capabilities (EPCs) from the **Entando Cloud Hub**



Standard EPC Integration:

1.) Ability to UX-only install an EPC into the App Builder from the hub (minium click install)
2.) After install, the EPC is available in the App Builder menu as shown above
3.) Click on the EPC menu, opens EPC UX in same window, but with a App Builder header
4.) Content/configurations created in EPC UX are then available in the App Builder interface, e.g., WCMS content created in Strapi will be available to drag/drop from App Builder's right menu

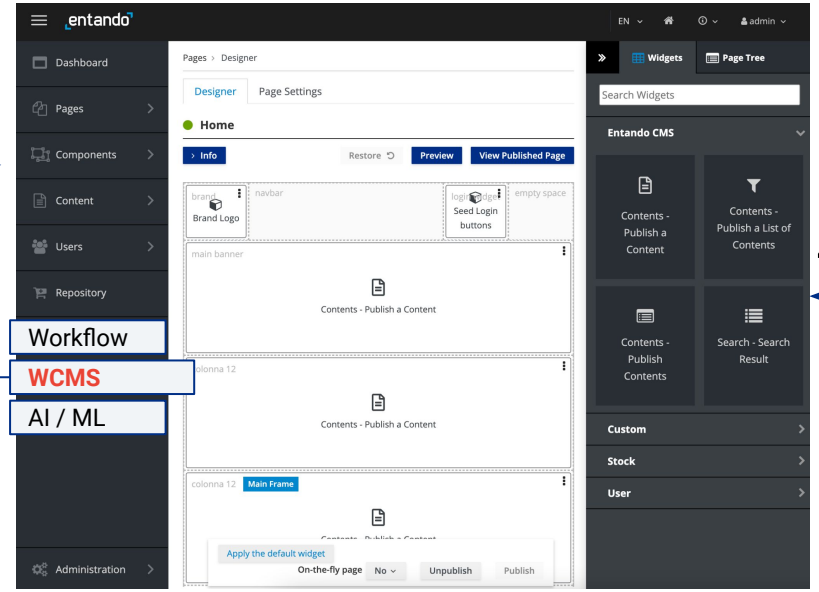
Add Entando Platform Capabilities (EPCs) from the **Entando Cloud Hub**



1

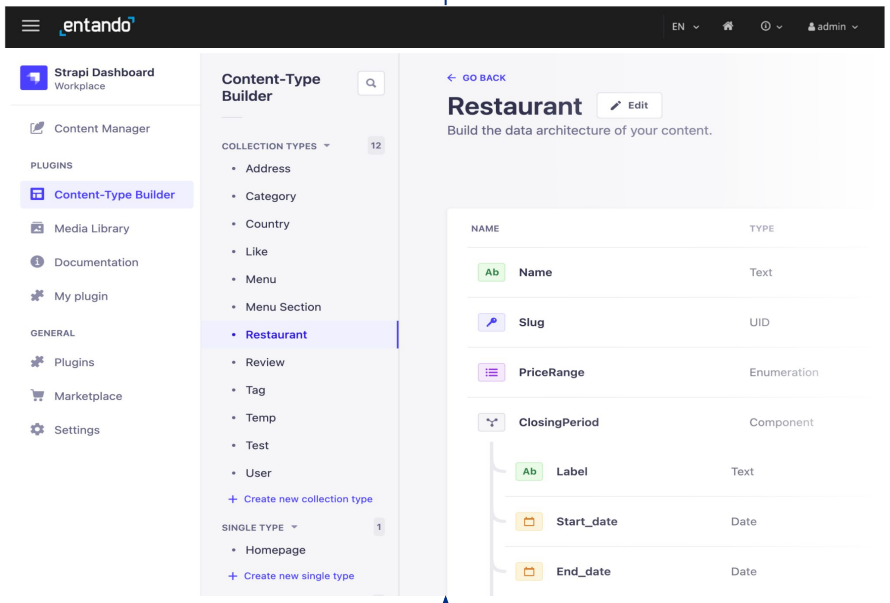
Install EPC from Hub

2



4

Return to App Builder



3

Open capability's interface

Integration with Existing Content Libraries

API Aggregation

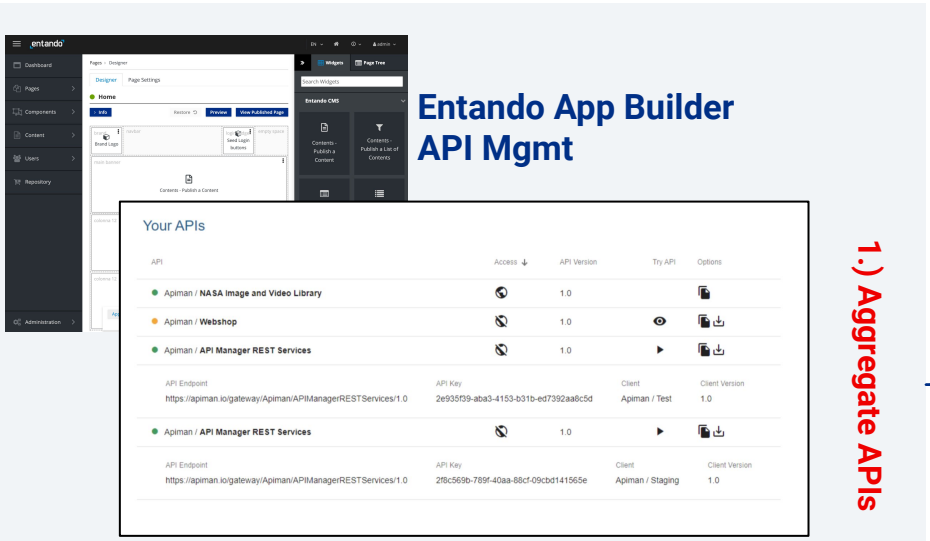
- Leverage existing 3rd party content
- Register APIs with Apiman (or other System EPC)
- Assemble best-of-breed stack

Not only for code reuse

- *Whether the project uses 35% or 95% reused code (PBCs), the final application requirements can also be built as components to gain the benefits of full modularity*

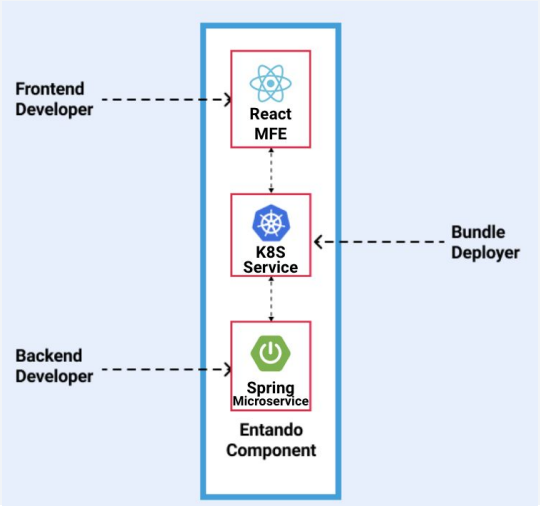
Benefits of Full Modularity

- Break work into independent teams
- Right skills for each component
- Right tools/lang/framework
- Release separately
- Reuse from Hub(s)

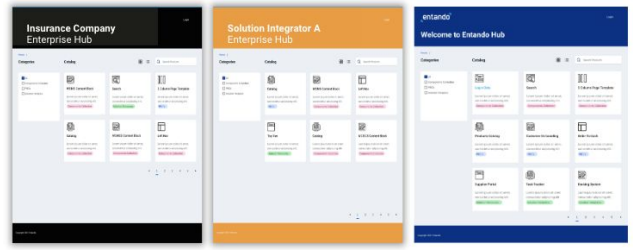


1.) Aggregate APIs

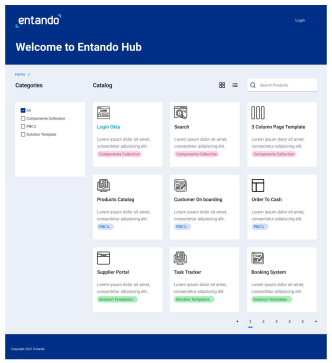
Entando Component Generator, and Bundle CLI



2.) Build, Bundle, Deploy



Bundle Templates and CI/CD Pipelines



Bundle Template

Create

Design, Create and Package Business Capabilities

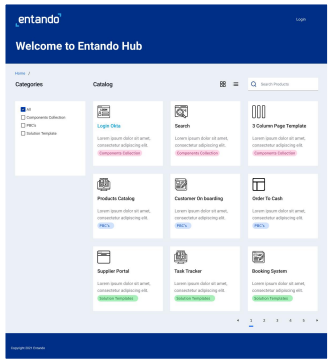
Pro Code

Pipelines

Pipelines

Azure

Pipelines



Bundle Version 2

Create

Pro Code

Design, Create and Package Business Cap

Compose

Compose Apps using Business Capabilities

Low Code

Bundle Template Definition

- a Bundle Template contains Micro Frontend and Microservices which are reusable components within an enterprise.

Use Templates:

- As Is
- Configure and use
- Extend and inherit updates to core
- Fork
- Update any of above, and redeploy to Hub

Case Studies

Entando Solution Use Cases

Entando is an Application Composition Platform that enables teams to build a variety of modern, cloud native applications such as:

- BPM/Process Automation Modernization
- Portals/Micro Portals
- Customer Experience Hubs
- Dashboards / Process Control
- Application Governance / Quality Control for Kubernetes

Passive Cycle Management System for Poste Italiane

BPM/PROCESS AUTOMATION MODERNIZATION

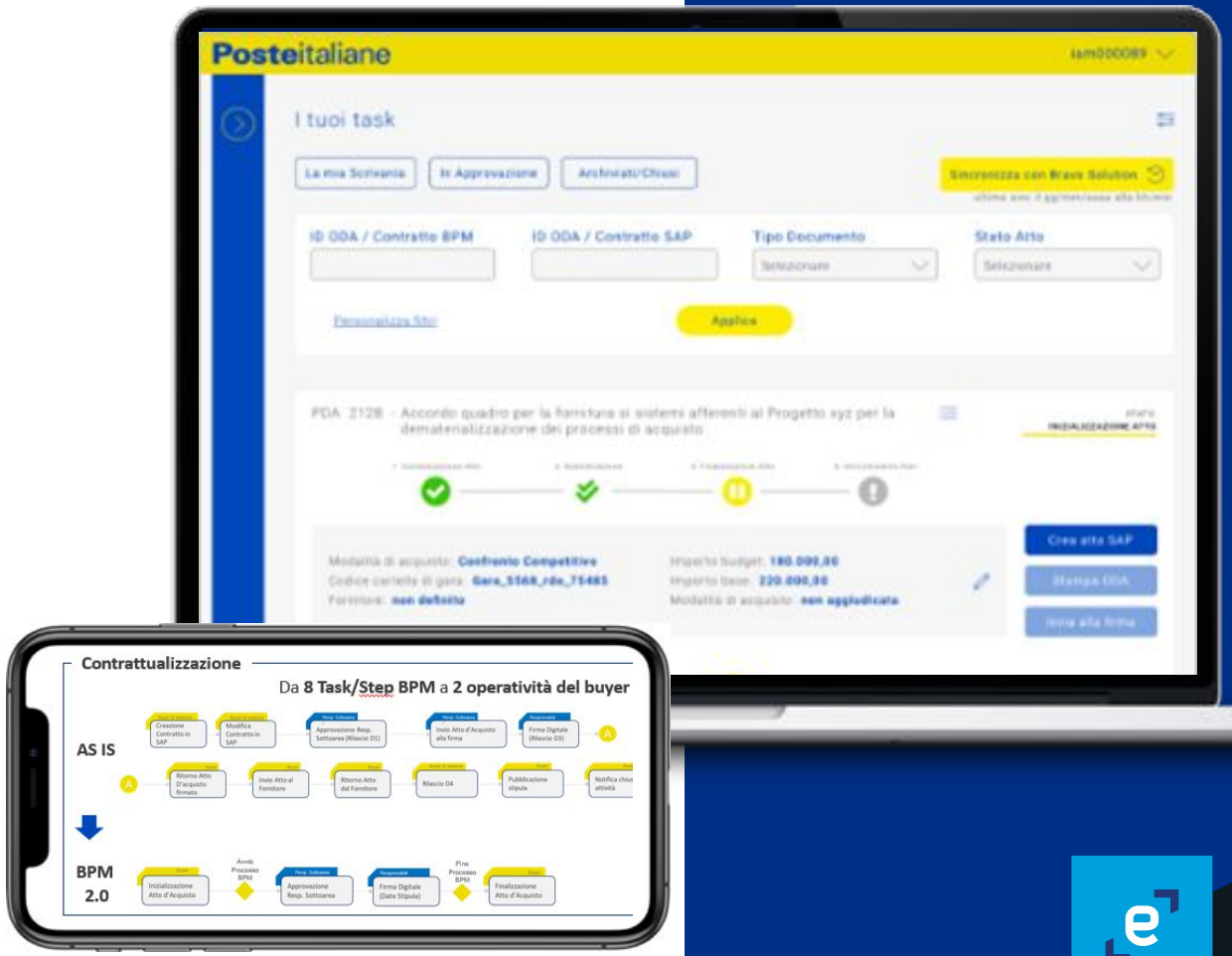
Posteitaliane

Challenge

The client needed help re-designing and re-engineering a platform that was suffering from basic user experience problems, over-engineered business processes and system performance problems that were slowing down operations and resulting in a decreased ability to execute and track tasks.

Solution

A modern platform based on Entando BPM capabilities with a redesigned UX delivering a buyer-centric approach, optimization of user tasks and greater process efficiency due to parallelization of tasks.



Impact

- Intuitive yet powerful UX and faster task execution times
- Use of Entando BPM capabilities integrated with a Tibco solution
- Enhanced monitoring of operations and productivity
- Improved performance

Italian Ministry of Justice

Open Source Collaboration and Information Hub

Challenge

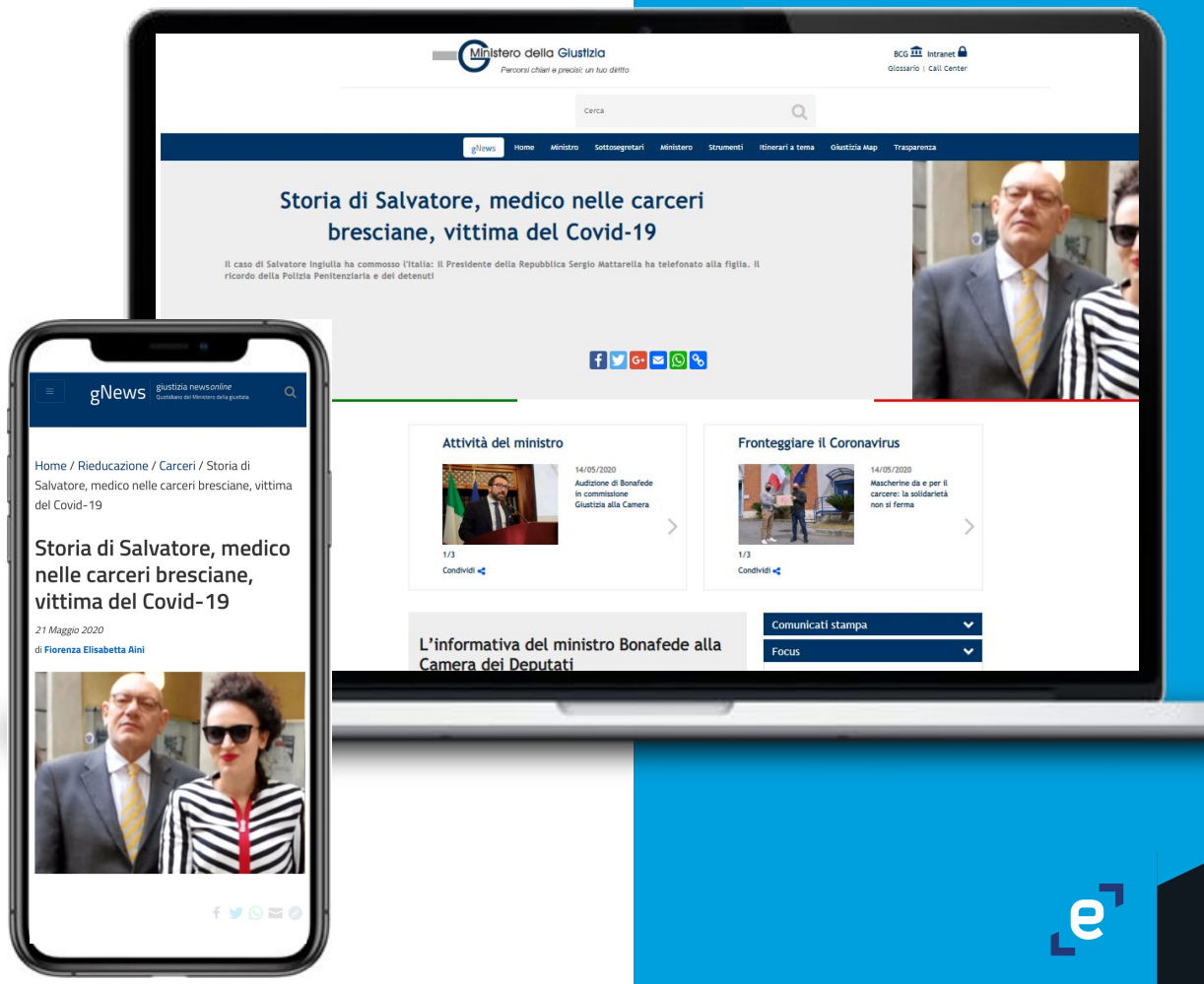
The Ministry of Justice needed to create a collaborative portal that enabled participatory design using open source technologies. The portal needed to be able to scale efficiently, as well as handle different types of use case while maintaining consistent UX.

Solution

An Entando implementation of a web portal, compliant with accessibility requirements of “Stanca Law” and that enables citizens and professionals to access role-specific information and services.

Impact

- Interoperability with third-party applications (ADN, Sheet designer, Giustizia News etc.)
- With a single instance of Entando portal, the administrator can create and manage more websites in order to maximize the return on investment.
- The platform currently manages more than 1000 web-pages and 50,000 pieces of content.



Rome Municipality

Citizen Information

CUSTOMER EXPERIENCE HUBS

ROMA CAPITALE

Challenge

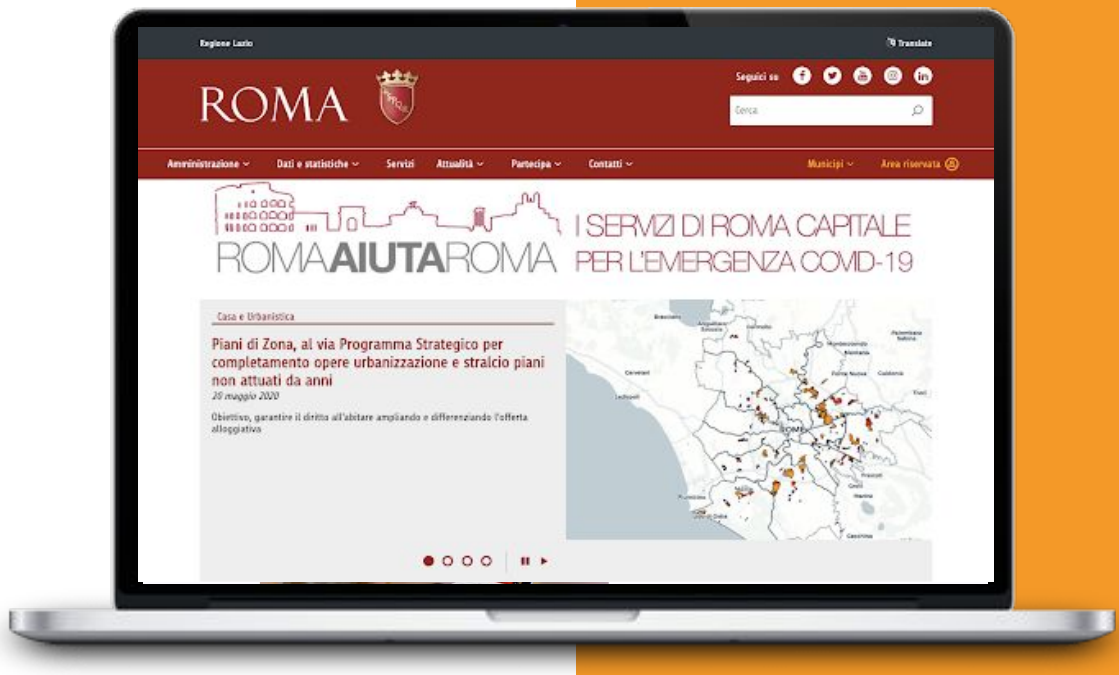
An open source citizen portal for the City of Rome that enables a very large editorial staff, and provides citizens with a better user experience and improved access to administration processes.

Solution

- Migrated from a monolithic legacy platform to a distributed platform based on Entando.
- Full integration to data and services from various backend systems.
- Fully compliant with AgID guidelines, regulations and standards.

Impact

- Enabled 60 editorial groups distributed across city districts
- Improved productivity for content management, improving the efficiency of the entire editorial team (300 editors)
- The citizen portal provides >70 services, has a potential reach of 4 Millions users with more than 1.5 Million unique visitors and around 500,000 registered users
- Entando includes Keycloak for the authentication layer and JHipster for standardizing component development. NOTE: supported SPID integration for identity.
-



Smart parking for IOT

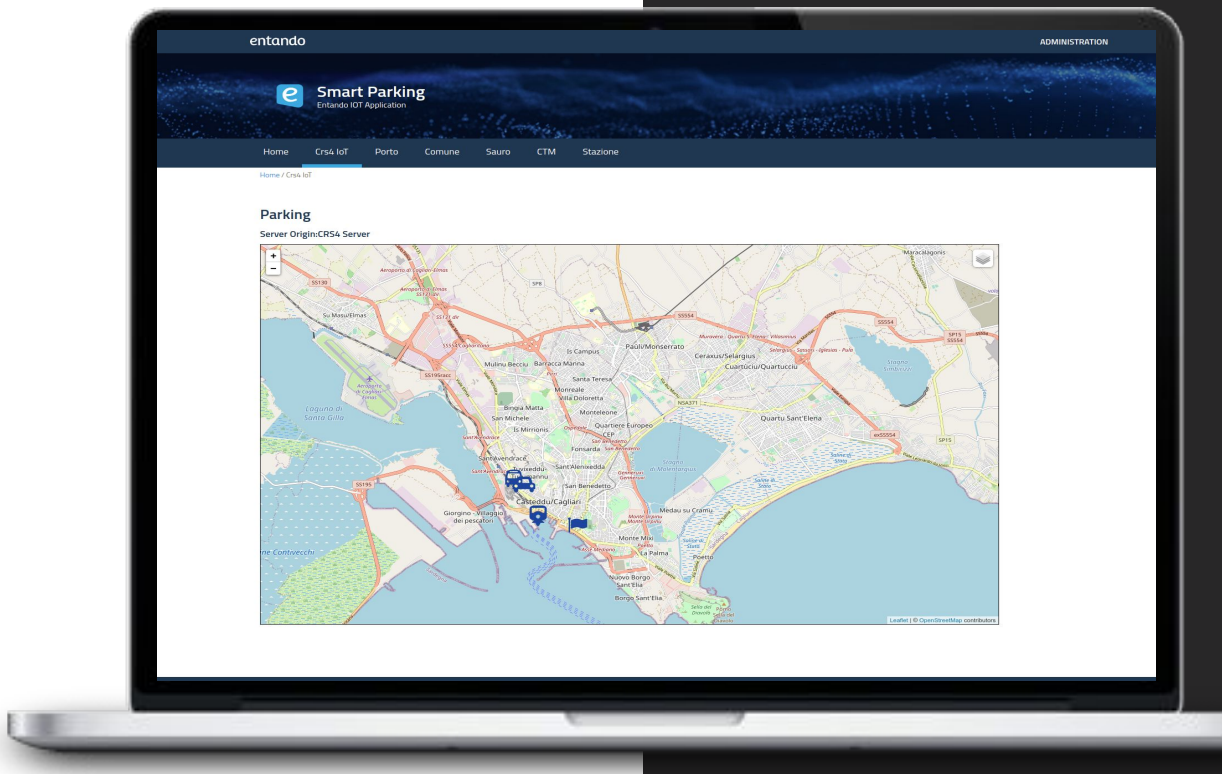
DASHBOARDS / PROCESS CONTROL

Challenge

Funded by the Sardina Region as the "Smart User Experience Platform" program was goaled to create an innovative experimental platform to simplify development of web applications for the Internet of Things (IoT) and to share that platform in open source.

Solution

Development of an IoT Smart UX platform that collects and visualizes, through an extensible UX/UI dashboard, data and information from devices that can be activated and managed across IoT platform services.



Impact

- Entando aims to increase its competitiveness by evolving its core business to better respond to the challenges of the Nexus of Forces (Social, Mobile, Cloud and Information), in particular in the Internet of Things area.
- The Abstraction Layer allows to abstract the connection between the Smart UX platform and any other IoT system
- Built with Entando 6 and based on self-contained, decoupled Micro Frontends that can be managed and deployed as containerized bundles.

SmartPath for Octo Telematics

APPLICATION GOVERNANCE / QUALITY CONTROL FOR KUBERNETES

Challenge

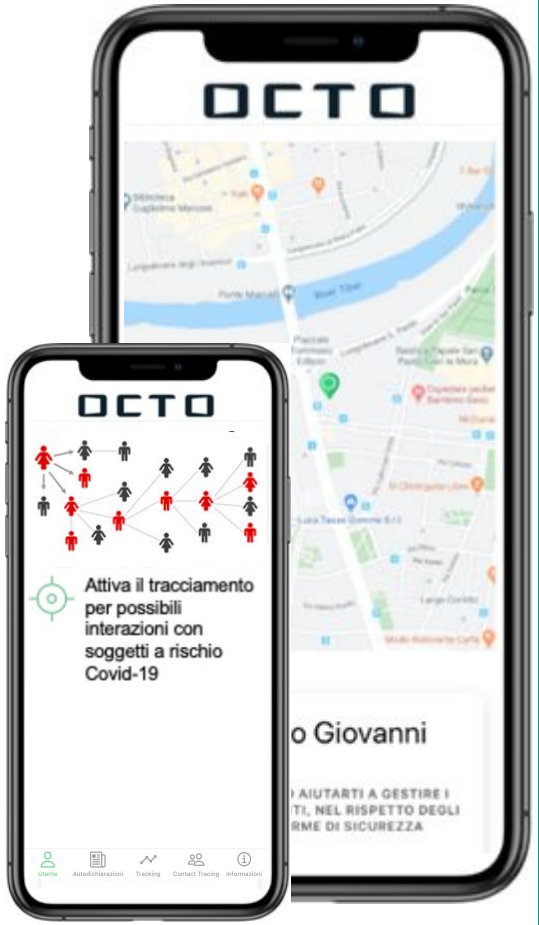
Responding to the COVID-19 emergency, Octo needed to deliver in a very compressed timeframe a digital platform capable of supporting citizens and public agencies by providing features to track a user's movement, perform anonymous contact tracing, and generate and validate documents.

Solution

Using the Entando architecture Octo was able to quickly assemble and deploy a progressive web app, based on modern web capabilities, to deliver an app-like experience to users.

Impact

- Lightweight web based solution
- Platform and device independent
- Fast prototyping and time to market with a fully functional prototype delivered to the customer in just one week
- Native device user experience



entando

What's Next?

- **Watch video with industry experts**
  a. Massimo Pezzini, formerly VP Distinguished Analyst with Gartner
  b. With Luca Mezzalira, Serverless Solutions Specialists at Amazon Web Services
  c. With James Governor Red Monk Analyst and Co-founder
- Try the live "Test Drive"
- Download the "What is an Application Composition Platform" whitepaper
- Book a Guided Demo
- Start developing now with developer resources, forums, tutorials


linkedin.com/company/entando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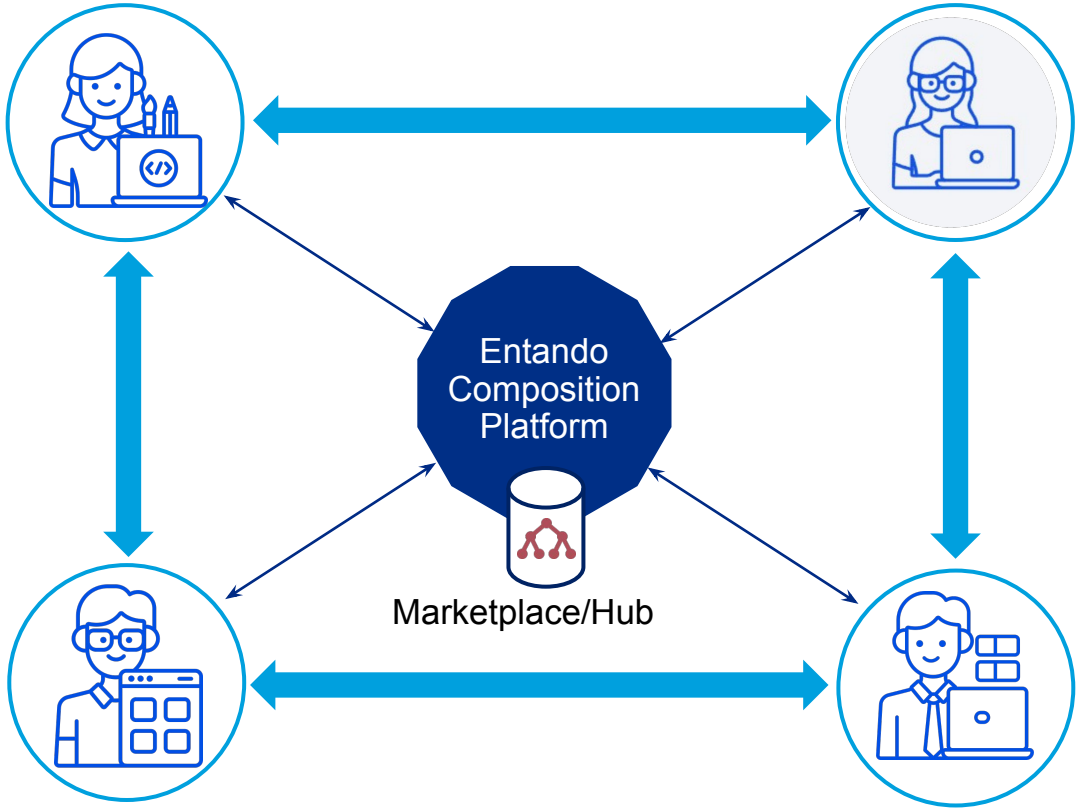
The Composable Journey

Creators
Design, Create and Package Business Capabilities

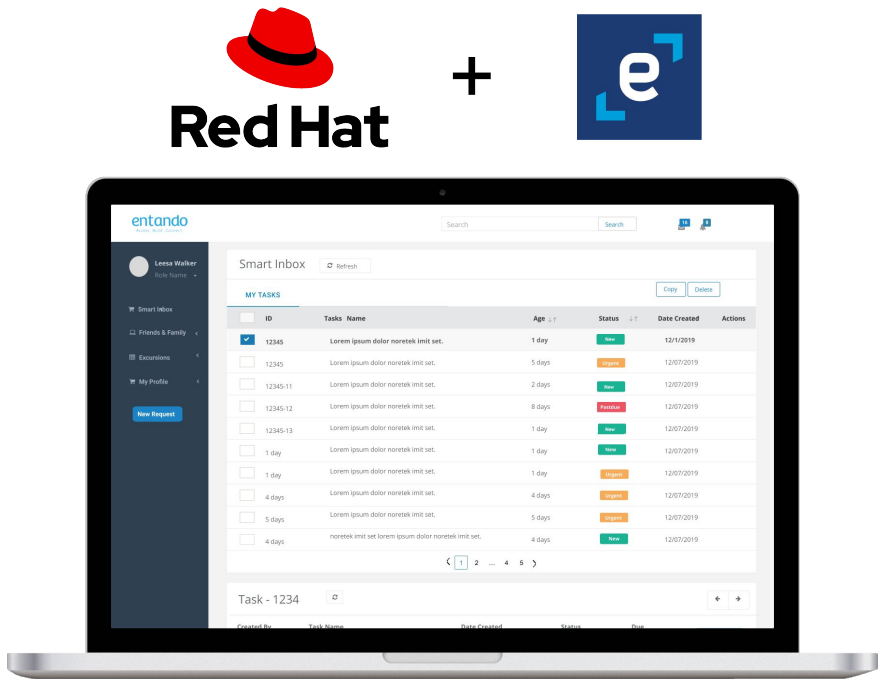


Consumers
Use, Monitor and Comment to Achieve Goals

Curators
Manage a Central Hub for Business Capabilities

Composers
Compose Apps using Business Capabilities

Red Hat PAM Use Case



Solution Description

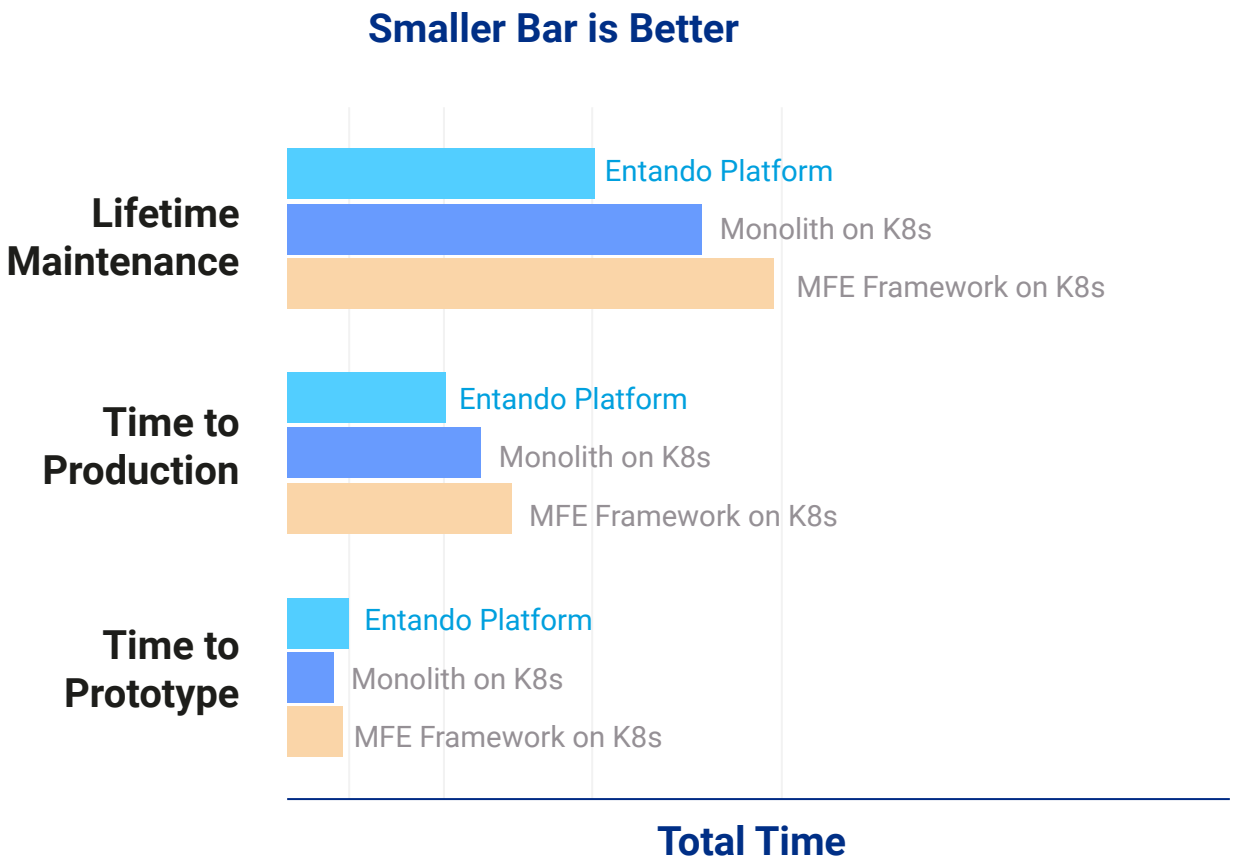
- Similar to the TIBCO use cases, in this case an existing RH PAM application can be update with a fresh frontend. Additionally, new workflow / business process applications can be created using Entando for the UX layer.

Business Benefits

- Pre-integration with K8s and day two operations can be updated via the backend. The modularity of the frontend allows new features to be added into the application as defined/built. Strong authentication with Keycloak also simplifies SSO and provides strong security.

Benefits of Modularity

Speed



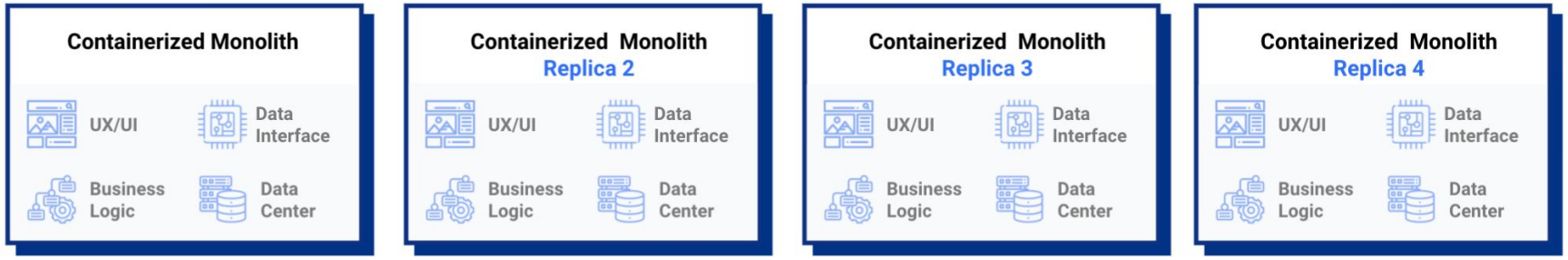
- Modular can take more time to start
  - But it accelerates updates drastically!
- With 100's to 1000's of updates from prototype to production, modular saves $$
- And saves $$$$ over the app lifetime
- Allows IT Automation across the entire app
- Reduces complexity / cost, accelerating innovation, enabling standardization

Benefits of Modularity

Lower Runtime costs

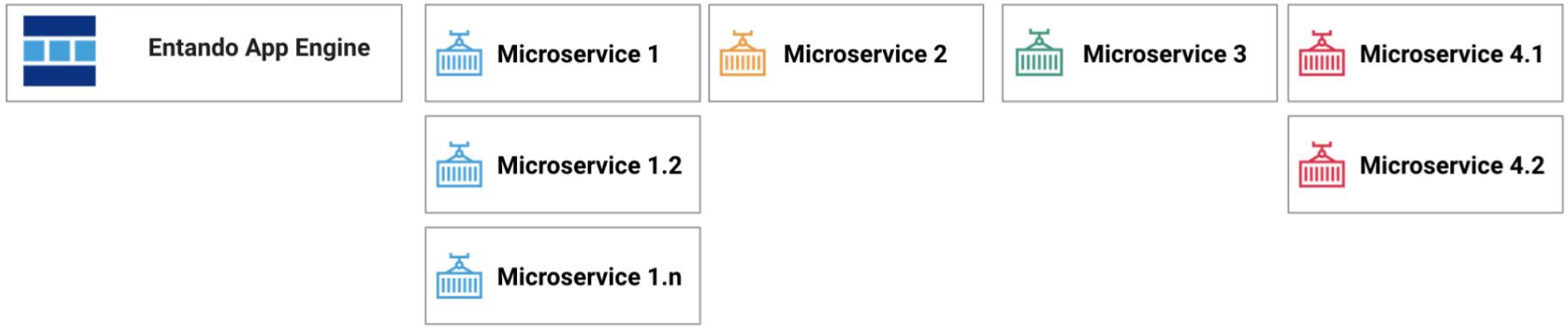
To scale a monolith means to replicate the entire application

$$$$$



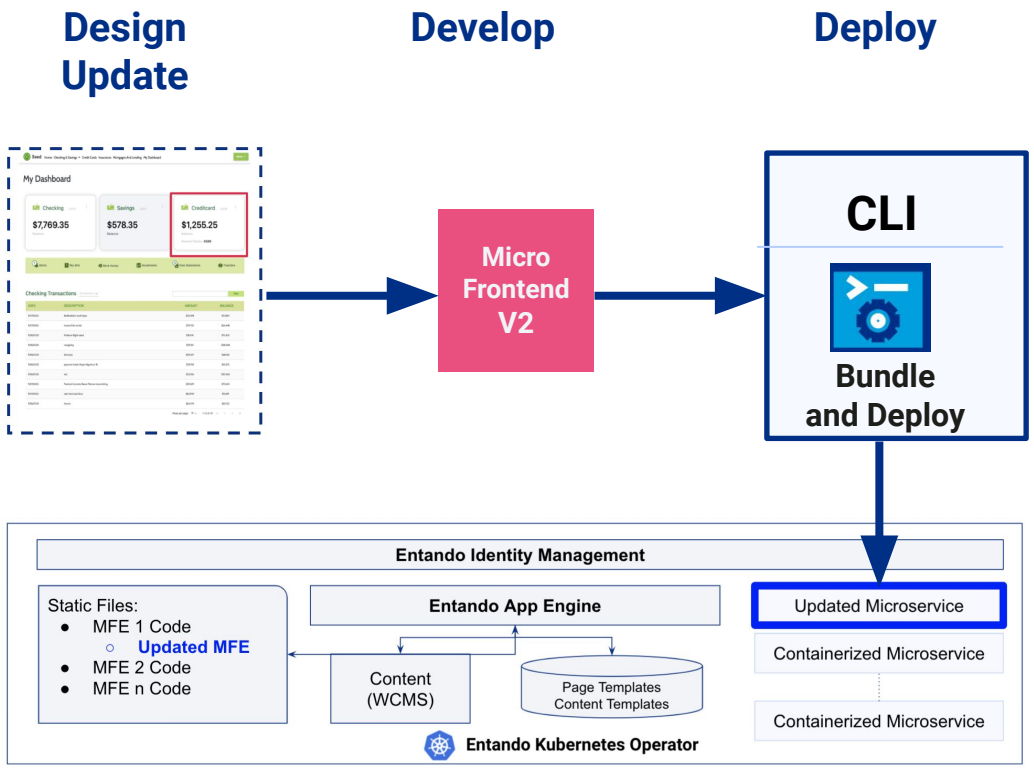
But with Entando, only scale the containers that need more horsepower.

$$



Benefits of Modularity

Streamline Security and Maintenance



- Streamline the complexity of modularity
  - K8s Operator
  - Low Code App Builder
  - Alignment of FE / BE updates
- Increasing app security and reliability
  - All services on the same domain
  - Java code is in its own microservice
  - A broken microservice does not break the app

Competition

ACP: the 3rd Gen of Accelerating App Dev

Reuse Existing PBCs or Leverage as Templates

Software as a Service

- Very fast to set up
- Prebuilt service
- Fully managed
- Lowest customization
- Bring your data

SalesForce.com

Low Code / No Code

- Fast to set up
- Requires minimum coding capabilities
- Click/drag drop, script to build application
- Can integrate, can customize, but restricted

Outsystems

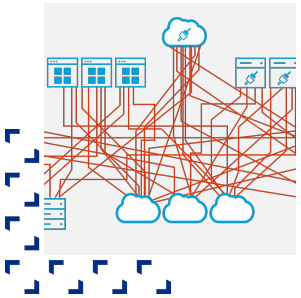
New: Application Composition

- Assemble modules
- Leverage pro-code templates
- Common Data Fabric
- Unified Business APIs
- Unified Best of Breed Stack
- Curated Library of PBCs
- Infinite customization
- Critical for innovation

entando

All 3 will be used within large enterprises for different application requirements

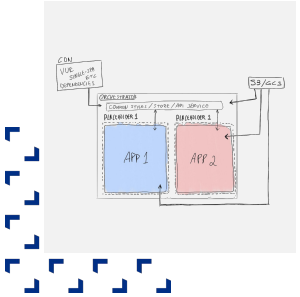
Competition



In-House Solutions

Custom code wrapped around each applications set of services, no standardization, security risks, complex updates

Wrappers with Angular, Vue, React



Micro Frontend Frameworks

Lightweight, but not a platform, only handle the frontend, not Kube-native,

Bit.dev, Module Federation, SystemJS, Piral, Single Spa

Competition

Low Code Platforms

Simplify development with integrated services, point and click functions. Work to eliminate need for developers.

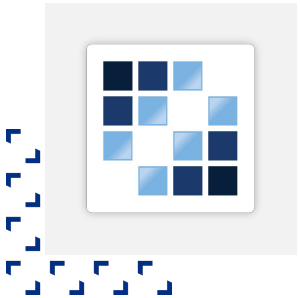
Outsystem, Mendix, Appian, Boomi, ...

outsystems

mendix

appian

boomi
Powering the Data Economy



DXP Platforms

Provide specific features to enable customer or user engagement and personalization. May run in K8S, but are not Kubernetes native, or fully modular.

Liferay, Adobe, Sitecore, Backbase, ...

Adobe Experience Manager

sitecore

LIFERAY

BACKBASE

ACP Competition

Application Composition Platforms

Platforms focused on assembling applications from a catalog of components.
Mostly No-code and Low-code

Not K8s focused. Not Open Source

SAP

Betty Blocks

unqork

NOVULO

Olympe

Why Entando?

Accelerate the time-to-market of your project reusing the Library of components and Packaged Business capabilities

Accelerate, Standardize and Automate Cloud-native App building .

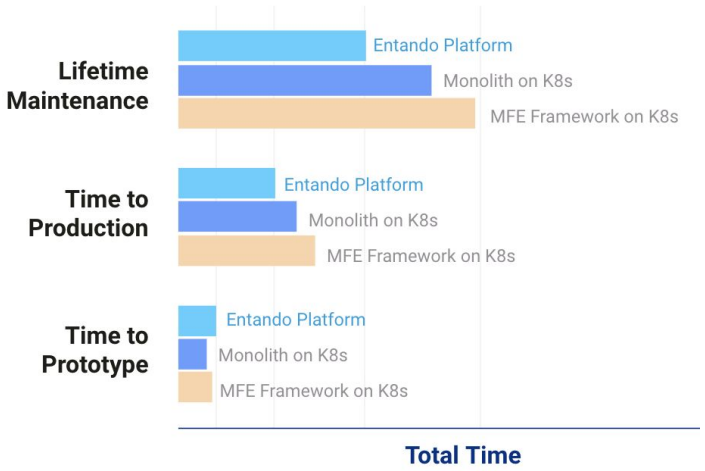
Cost reduction, reduce total cost of application life-cycle management

Streamline Security

No technology lock-in: what you develop for Entando is ready to be ported and reused
We are technology Agnostic on both front-end and back-end

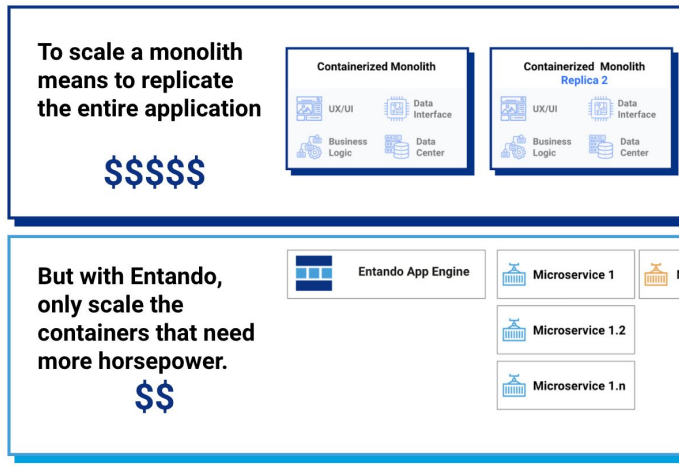
Benefits of Entando

Accelerate App Dev



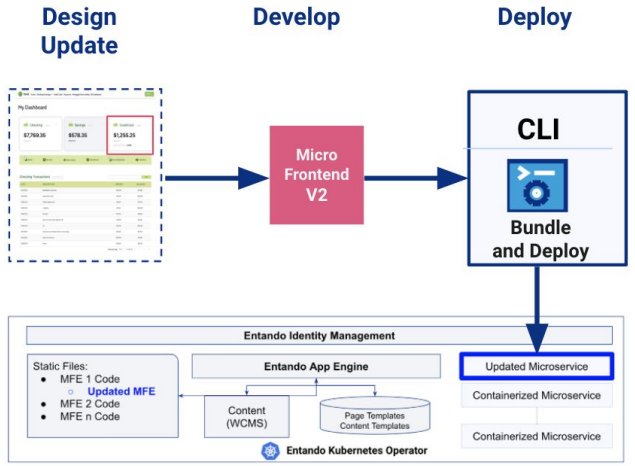
Code Reuse
Bundle Templates
Team Development
Polyglot

Lower Runtime Cost



Only scale modules needed
Modular HA
Serverless Modules
Cloud or On Prem

Streamline Maint. and Security



Modular isolation of problem
Start with MVPs
Modular updates
Integration with CI/CD

No Code VS Pro Code