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Code-Free Data Integration for Comprehensive App Development (COAD)

Naveen Koka

* na.koka@outlook.com

ABSTRACT

The COAD (Comprehensive App Development) is a dynamic platform designed to optimize and streamline the deployment and management of applications within organizational settings. With a focus on customization and user-specific configurations, the COAD empowers users to tailor applications to their unique requirements. The platform supports diverse hosting options, enabling deployment in private or public clouds, including popular providers like AWS, Azure, and Google Cloud.

One of the COAD's key features is its robust security infrastructure, which seamlessly integrates with various authentication mechanisms such as OAuth and Single Sign-On (SSO). This ensures enhanced protection against unauthorized access and reinforces data security.

Moreover, the COAD introduces a high level of flexibility in theming and customization, allowing users to modify headers, text, font, colors, and even adopt different themes at both the application and user levels. This adaptability not only improves user experience but also addresses specific organizational branding requirements.

In addition to its user-centric approach, the COAD offers an efficient configuration management system. Users, particularly administrators, can control and modify application configurations at each stage, ensuring a smooth and adaptable deployment process.

Furthermore, the COAD acknowledges the importance of minimizing downtime during application upgrades. It facilitates seamless deployments and upgrades, reducing or eliminating disruptions to ongoing operations.

Overall, the COAD emerges as a comprehensive solution, providing organizations with the tools needed to enhance user experience, enforce security measures, and efficiently manage application deployment in alignment with specific organizational requirements.

Key words: Comprehensive App Development, Transaction-based applications, Mobile Apps, One Platform

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INTRODUCTION

In today's routine operations, transaction-based applications play a crucial role for a diverse range of users, spanning from small businesses to large enterprises. Individuals and organizations alike rely on various applications tailored for specific functions such as Human Resources, Sales, Marketing, and Customer Care. Numerous companies provide specialized apps, each focusing on one or more specific areas. These applications may be self-hosted or accessible online, with varying levels of mobility features. Authentication mechanisms also vary across these applications, contributing to the distinct themes that define each one.

PROBLEM STATEMENT

All kinds of organizations or individual customers face the challenge of relying on multiple transaction-based applications to manage their operations, encompassing both internal processes and customer interactions. Internally, they utilize applications to manage employees, finance, internal ticketing etc. Externally, they utilize

specific applications for marketing, customer care, and sales. Some customers still utilize legacy systems which are home grown application or hosted by companies.

However, many of these applications fail to fully meet customer needs, leading to a cycle of searching for new solutions. Procuring these platforms involves significant time and financial investment, often with delayed results. While some applications may succeed, others become costly to maintain, leading to their eventual closure.

The overall cost of procuring, purchasing, configuring, maintaining, and retiring these applications is substantial. Configuring and maintaining them also requires hiring additional developers, leading to competency challenges in recruitment.

Furthermore, when issues arise with these applications, users must navigate through various channels to report problems, whether through administrators or the respective companies themselves.

SOLUTION

Comprehensive app development (COAD) (see Figure 1) is a platform provided with Configuration and runtime where the users can configure the apps by just dragging and dropping the components. Once the application is verified then the assign to the user which can intern the COAD can send notifications to the users that are assigned. The COAD is intelligent enough to internally take care of the creating the different software component internally like database, logic and securely associate to the organization that belongs to. While configuring the app the COAD can provide multiple features like configuring criteria's validation rules and notifications with plain English format.

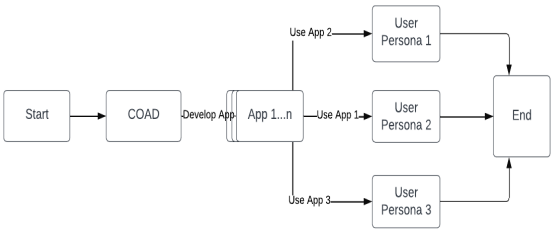

Fig. 1 COAD

The COAD will be explained in three different areas Authentication, Application Development and Application Usage

Authentication

The platform to offer the flexibility to implement either its authentication system or utilize existing authentication mechanisms, provided they adhere to recognized standards such as OAUTH, SSO, and BASIC Authentication.

If the organization opts for the latter option, another advantage is the ability to manage app authorization. This allows us to control user access based on their personas.

Application Development

The platform offers essential OOAB (Out-of-the-Box) apps specifically designed for various verticals, including but not limited to Marketing, Sales, Finance, Human Resources, etc.

The platform must also offer essential components that can be easily dragged and dropped, with explanations provided in plain, locale-based text.

Introducing a new role within the app, termed Organization Admin (OA), tasked with facilitating app access for users.

The platform will feature an application place, allowing the Organization Admin (OA) to virtually download and deploy apps to users.

The downloaded virtual app is customized for their organization, enabling further enhancements to be made to these applications.

For instance, if the Organization Admin (OA) chooses to include a field with options in a form, all they need to do is drag and drop the option field. The platform automatically handles the storage of the associated data.

Application Usage

Introducing a new role within the app, termed Organization Users (OU), where the app will be helpful for the day-to-day job.

Upon logging into the platform, the OU will encounter their assigned app(s) with a modern user interface.

The COAD ensures data security by allowing users to access only qualified information.

Additionally, it features dashboard and reporting components, offering users a complete 360-degree perspective on data relevant to their roles.

Change Requests

If users identify any potential improvements in the app, they can submit a request to their internal team through the platform's ticketing app, developed internally. This ticketing app is equipped with features such as email notifications, ensuring that responsible users are promptly notified.

Once the OA receives the request and if it's valid then OA can configure the changes and be able send a preview to perform the UAT. Once users approves then the application can be deployed to the users

Upgrades & Deployments

The COAD serves as a platform for deploying or upgrading applications to specific personas. This ensures minimal or no downtime during the app upgrade process.

Themes

At times this section is overlooked, yet they play a vital role for companies. To illustrate, consider a scenario where a company plans an application that meets all requirements but is ultimately abandoned. This is because the application adopts a theme from a competitor, and altering the colors is either impossible or time-consuming due to code modifications.

The COAD offers a configuration feature that allows users to customize headers, text, font, and colors. Going a step further, it provides the flexibility to change themes at both the app and user levels, enabling enhanced customization options for themes.

At every stage, the OA has the ability to manage the app's configuration.

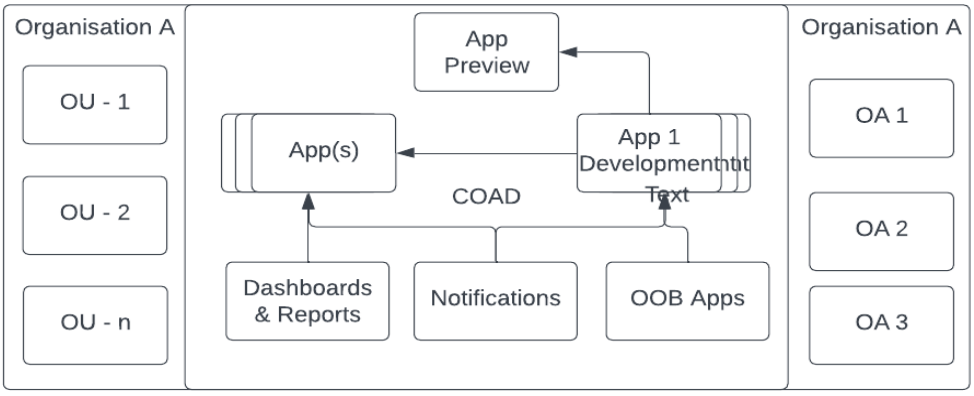

Fig. 2 COAD with multiple OA and OU

COAD PLATFORM

The platform serves as the fundamental infrastructure for delivering applications, representing the critical junction where practical implementation takes place. It bears the responsibility of managing diverse organizations, users, and applications. The following components require careful attention and maintenance. As the platform operates on a multi-tenant model, development becomes crucial, and careful attention must be given to each of the following components:

COAD Designer

The Designer is where applications are created. The OA primarily focuses on this component to deliver apps to users. The platform stores all configurations in JSON schema format. The designer to be smart enough to maintain all the apps based on the OA organization.

The code within the Designer platform must internally handle the creation of essential virtual objects, tables, and any other business logic required to effectively support the core functionalities.

The designer functionality should be restricted solely to administrators and not be accessible to regular users. The platform should incorporate an option to block user access to the designer, ensuring that this critical tool is exclusively managed and controlled by OA.

The apps to have options to configure but not limited to create, list, update and delete the records.

COAD Core

The Core is the final stage where applications are delivered. The OU primarily concentrate on this component for their daily activities. The platform is tasked with accurately retrieving the assigned app and rendering the screen according to the user login. Once the app is appropriately displayed, the platform must fetch the relevant data based on the app's JSON configuration and the specific user.

The core business logic of COAD is responsible for accurately executing all CRUD operations on the data. It dynamically manages validation rules, formulas, and other criteria evaluations based on the configuration.

COAD Reports

The platform is required to offer a variety of reports, catering to the diverse data representation needs of users. Users should have access to both configuration and runtime options for generating reports efficiently.

COAD Dashboards

The platform needs to offer a mechanism for configuring dashboards, allowing users to host various operations such as reports, lists, quick actions, and more within a single interface.

Configuring dashboards can be approached through various methods, and one potential solution involves association with the specific apps being delivered to the user.

COAD Notifications

Various types of notifications can be dispatched to users, serving the purpose of informing them in advance. This proactive communication is essential for users to derive maximum benefits and optimize their utilization of the platform.

All notifications should be dynamically generated, allowing contact information to be extracted from the transaction record. The designer should include an option to set the relevant field when configuring notifications, ensuring flexibility and adaptability in communication.

COAD App review instances

COAD must offer review instances, allowing users to validate apps before their official launch. This robust feature empowers OAs to seamlessly manage the entire life cycle of the app, ensuring thorough testing and validation before making it live.

The platform should possess the capability to clone the production environment to the review instance, seamlessly integrating this functionality within the designer interface. This ensures a convenient and efficient process for creating review instances that accurately replicate the production environment.

COAD Logs

Logs play a pivotal role in comprehending the activities within the platform. Given the multi-tenant nature, efficiently storing logs per user poses a challenge. Handling this data-intensive operation necessitates defining rules regarding the retention period of the data, emphasizing the importance of strategizing around data age.

A definitive user interface must be provided for displaying data, with categorization available for both user and admin level logs. Admin logs play a crucial role in facilitating efficient debugging of issues, underscoring the need for clear visibility and accessibility within the platform's user interface.

TECHNICAL CONSIDERATIONS

The separation of UI and business logic, or decoupling, contributes to the ease of maintaining and upgrading the platform. This modular approach allows for independent development and updates to the user interface and underlying business logic, facilitating a more streamlined and manageable upgrade process.

SOA Architecture

Establishing dedicated services for the designer, core, reports, and dashboards aids in achieving load balancing for the server. This structured approach ensures that each component has specialized resources, optimizing performance and distribution of tasks across the server infrastructure.

Databases

The critical process of evaluating and designing databases to handle diverse data types requires careful consideration. It is essential to make informed decisions regarding the choice between transactional and NoSQL databases, ensuring that the selected database model aligns with the specific needs and characteristics of the data being managed.

USES

Customers will gain significant benefits from implementing the COAD, ranging from streamlining user usability to achieving cost savings. Let's delve into some crucial advantages in this section.

Users usability

One platform for all the applications. The Users will have the seamless experience of using the applications. The themes can be tailored to the experience for the users.

A single user should be able to access multiple applications seamlessly delivered by the platform, all of which are optimally designed by the UX team for an enhanced user experience.

Security

Since the platform can be hosted in your private cloud or any public cloud such as AWS, Azure, Google, etc., it can seamlessly align with the same security policies by default.

By embracing authentication mechanisms like OAuth and Single Sign-On (SSO), we can bolster the platform's defenses against unauthorized usage.

Customers have the flexibility to enforce rules for accessing the apps within their designated IP ranges.

Cost Savings

Internally managed, the platform facilitates straightforward application development and user reviews. Continuous feedback fosters agility, yielding prompt results. With only one platform to learn, manage, and maintain, the maintenance cost is minimized.

SCOPE

The COAD's scope is designed to provide organizations with a versatile and user-centric platform, promoting efficient development, customization, and management of applications while prioritizing security and cost-effectiveness.

EFFECTIVE PLATFORM COMMUNICATION

Given the multi-tenant architecture of the platform, effective communication with all organizations is paramount. It is essential to transmit notifications about platform upgrades, planned outages, and new feature releases, ensuring that all users are well-informed and prepared for any changes or improvements.

CONCLUSION

In conclusion, the Customizable Organizational Application Deployment (COAD) emerges as a pivotal solution catering to the diverse and evolving needs of organizations in the realm of application development and

management. By fostering internal management, the platform empowers users to seamlessly develop and review applications, creating an environment conducive to agile development.

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