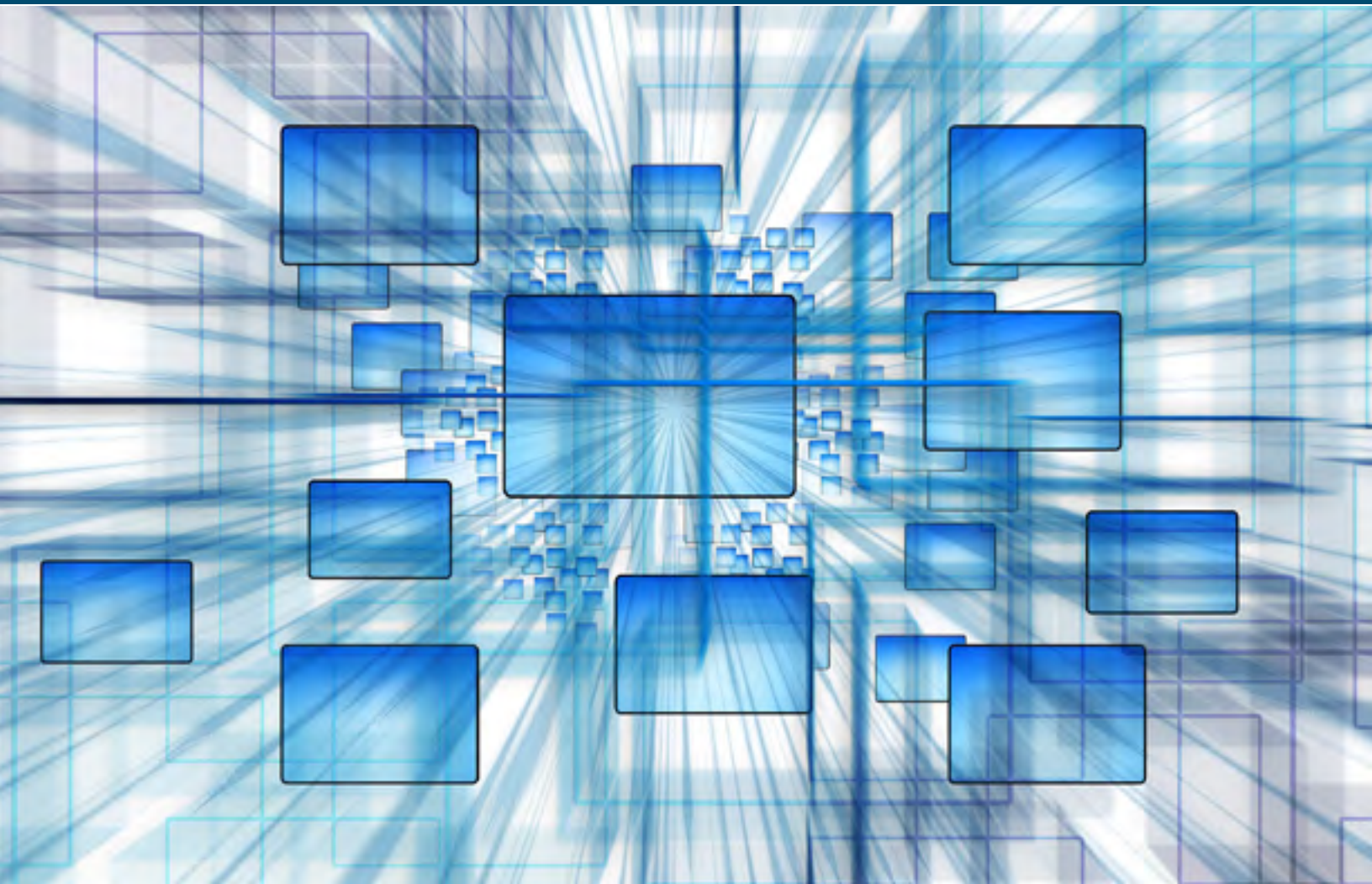


**ZOHO CREATOR PLATFORM
LOW-CODE DEVELOPMENT FOR A NEW WORLD**
ZOHO CORPORATION

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Zoho Creator Platform—Low-Code Development for a New World

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ABOUT THIS REPORT

Over the past decade or so, business operations have become increasingly complex and attuned to rapid changes. Globalization has brought both great opportunities yet greater challenges for every organization.

Software provider organizations are being challenged to meet the demands of software consumer organizations for digital technologies that can be rapidly designed and deployed and that are increasingly effective. There is an increased need for new technologies to ensure business operations and processes keep running under optimal conditions, placing demands for new ways of developing new software applications faster and easier.

With digital transformation initiatives on the rise to overcome a reality reshaped by the pandemic, organizations look to new enterprise software offerings, such as low-code development, to help them meet their needs.

This report provides a comprehensive review of Zoho's new Creator Platform and the platform's approach to achieving effective low-code development and process automation.

The report contains the following elements:

- A general discussion of the technical and business impact of low-code development platforms and their increasing importance for the future of digital transformation efforts and business operations.
- A description of the new release of Zoho Creator Platform—the solution's technology and business value:
 - Functional, architectural, and business perspectives
 - Key capabilities for low-code application development
 - Role in tactical and strategic decision-making within digital transformation and process optimization efforts
- Analyst observations and commentary

A lot of people resist transition and therefore never allow themselves to enjoy who they are. Embrace the change, no matter what it is; once you do, you can learn about the new world you're in and take advantage of it.

–Nikki Giovanni

INTRODUCTION

Coined by Forrester, the term *low-code development* refers to a new type of software development environment in which a user can design, create, and deploy a new software application with *minimal* amount of code writing.

Low-code development platforms have roots that can be directly traced back to the so-called fourth-generation programming languages (4GPL). They share the same goal with these early systems in providing users with ways, especially through a graphical interface, to develop complete applications in a fast and easy manner. These platforms incorporate technologies such as rapid application development (RAD) and, of course, object-based and event-based programming methodologies to replace traditional text-based interfaces via new and sophisticated graphical user interfaces (GUIs) that aim to facilitate and accelerate efforts to develop new software applications.

While low-code development platforms have been on the market for several years now, sudden changes in the enterprise software landscape brought about by the pandemic as well as global economic and market shifts have accelerated the evolution of flexible and rapidly developed new process-based software applications and their adoption within organizations to yield more efficient ways of responding to changing business conditions.

Consequently, over the past four years, the incorporation of innovative technologies such as advanced analytics and artificial intelligence (AI) into low-code development platforms has dramatically enhanced the design, development, and deployment of these new and effective software applications.

In the following pages, we will take a brief look at the current state of the market for low-code development platforms and the potential advantages and benefits of using the new Zoho Creator Platform to arm decision makers with the necessary information and considerations for evaluating such solutions for their organizations.

LOW-CODE DEVELOPMENT IN A NEW WORLD

The world has forever changed. Economic globalization, mobile devices, social media, the Internet of Things, etc.—ah! and don't forget the pandemic—have changed the world in many ways.

From an economic and business perspective, developments occur almost at a frenetic pace, forcing companies to adopt new and innovative business practices, most of them backed by new software technologies.

From migrating to the cloud to incorporating a new generation of enterprise software solutions, many organizations are increasingly turning to software technologies to achieve their most needed transformation—digital transformation. Many organizations are either undertaking or have firmly put in place digital transformation initiatives.

But for some of these organizations it goes far more than software adoption. For them, a key aspect for achieving successful digital transformation implies also being able to produce *in-house* the necessary software applications that enable them to create new applications or improve the efficacy and efficiency of their existing applications—all at lightning speed and with fewer human resources and at lower costs.

The need for new ways of deploying applications faster and securely has spurred organizations to adopt new ways of developing applications using the least possible amount of writing code—namely, low-code development platforms.

The sudden explosion in popularity of these types of solutions has led to the emergence of variety of low-code development platforms. These range from the so-called general-purpose platforms designed to enable the development of any type of application to platforms created for specific purposes such mobile application development (MADP) to platforms focusing on the development of applications for the execution of business processes or low-code BPM.

WHY LOW-CODE DEVELOPMENT FOR BUSINESS PROCESSES?

Along the evolution of low-code development platforms, many organizations have realized that their need for new applications stems from their need to improve their operations and, most importantly, their inherent business processes. It did not take long for software vendors to realize that traditional and new business process management platforms are a perfect fit for the incorporation low-code development features.

The benefits of incorporating a low-code development platform for process-centric applications include the following:

- **Ease of use and accessibility.** Due to their graphical development and functional encapsulation nature, low-code development platforms can ease the software development process significantly, making it accessible to both savvy (developers) and non-savvy (business) users—hence enabling both types to develop the required applications.
- **Development time reduction.** A first consequence of the previous benefit is, of course, the reduction in the time to design, develop, and deploy new process-based applications that meet new business operation and process requirements.
- **Reduction of development costs.** In turn, the ability to produce new applications easier and faster leads to the reduction of costs over the medium and long term as well as the significant elevation of the return of investment (ROI).
- **Effective risk management and governance.** By enabling developers to rapidly change code and develop new applications, low-code development platforms allow organizations to adapt faster to frequently changing external and internal conditions and regulations.

But despite these and many other potential benefits from the adoption of low-code development platforms, organizations must address key considerations and challenges before considering the adoption of a low-code development platform.

LOW-CODE DEVELOPMENT: BEFORE YOU GO ALL IN

There are many potential benefits from deploying a low-code development platform, which explains the significant growth in interest and adoption of these platforms. And as with the evaluation of any type of software technology comes the need for proper identification of potential hurdles and *to-dos* before choosing the best low-code development platform for an organization.

Listed below are some of these considerations:

- **Flexibility and customization capabilities.** A common fear for any organization developing its business applications is to have a development platform that does not meet its requirements for performing software modifications and customizations readily and rapidly. This is a particular

concern for low-code platforms. Before the adoption of a given platform, it is imperative to determine whether the platform's capabilities will meet the developing needs of the organization.

- **Integration capabilities.** Another key aspect to consider when selecting a low-code deployment solution is the platform's ability to integrate with the existing enterprise solutions that comprise the organization's software stack. New applications developed with the low-code platform will most probably interact closely with the existing applications to enhance business processes.
- **Security and Governance.** With the adoption of a low-code development platform, many organizations aim to give both traditional developers and citizen developers (business users) the ability to develop new business applications, yet a key concern is to be able to control and monitor what users are building, whether for security or compliance and regulatory purposes. It is important to count on a platform that will enable an organization to give users access to developing the necessary applications while allowing it to perform adequate governance and control practices that keep the organization protected from deliberate or inadvertent security threats.
- **Data Oversight.** It is imperative to consider a low-code development platform capable of ensuring proper and secure use of data across new and existing applications by providing the necessary management tools for proper access granting, or denying, of data according to users and their profiles.
- **Application auditing.** Due to their nature, low-code development platforms enable more users to engage in application development both individually as well as collaboratively. Organizations will be able to audit and manage these applications by having control over their quality, security, as well as internal and external compliance for regulations.

These and other important activities can be considered before setting on a path for the selection and subsequent adoption of a low-code development platform.

Overall, low-code development platforms, when properly adopted, have the potential to help organizations to better digitize processes in a way that allows businesses to quickly shift goals, if needed, to accommodate new or changing priorities.

THREE CONSIDERATIONS FOR ADOPTION OF A SUCCESSFUL LOW-CODE PLATFORM

The adoption of a low-code development platform can be key for organizations big and small to achieve operational excellence via the improvement of management, execution, and automation of business processes.

For those companies in the process of evaluating or adopting a low-code platform, there are three main points to consider from a business perspective to increase the likelihood of successful platform adoption:

1. **Identifying a clear business case.** By having a well-defined business case, it is easy to justify the need for a low-code platform as well as to assess the feasibility of platform adoption. Establishing a business case can be instrumental for not only obtaining the necessary support from all stakeholders and business decision makers but also determining the starting point for the overall low-code platform initiative.
2. **Obtaining stakeholders' support.** Obtaining support from stakeholders and executives is a major win for a new low-code platform adoption initiative. Well-established business and technical and economic feasibility cases can really go a long way to getting these stakeholders to include this initiative on their project list—the higher your initiative is on that list, the more priority it will receive.
3. **Developing a good roadmap.** Finally, developing a clear and comprehensive adoption roadmap will serve as a core guide throughout all the steps for the successful adoption of a low-code platform across the organization. The establishment of a roadmap should consider general aspects, from initial functional to security and governance specifications all the way to specific aspects such as integration with the existing enterprise software stack as well as quality control.

ZOHO'S NEW CREATOR PLATFORM: CODING IN A NEW WORLD

A number of software providers have invested in the development of a new generation of tools for application development, such as low-code development platforms. Zoho is one such provider.

With a large trajectory in the provision of business software, Zoho has under its software stack a new low-code development offering: the Zoho Creator Platform. This is a solution Zoho is confident will become a flagship offering for those organizations looking to adopt a low-code development platform. In the following sections we will dive into what Zoho has to offer with this new platform for the development of applications.

ABOUT ZOHO CORPORATION

"We are a state-of-the-art tech company with a very old-fashioned approach to company building."

–Sridhar Vembu, CEO, Zoho Corporation

Founded in 1996 by Sridhar Vembu under the name AdventNet, the company aimed to provide network management systems and services. With the expansion of its cloud-based software services, mainly its widely successful cloud-based Zoho CRM offering, in 2009 the company changed its name to Zoho Corporation.

Regarded as a cloud-based CRM software provider at first, Zoho today has expanded its cloud-based business software offerings to include a number of applications that cover many areas of enterprise software, including its full [CRM Platform](#). With many offerings under its technology umbrella, Zoho has expanded the reach of business services (figure 1), including analytics ([Zoho Analytics](#)), accounting ([Zoho Books](#)), and, of course, low-code application development ([Zoho Creator](#)).

Counting on decades of growth, Zoho attends to more than 75 million users across a wide range of companies, lines of business, and industries across the globe.

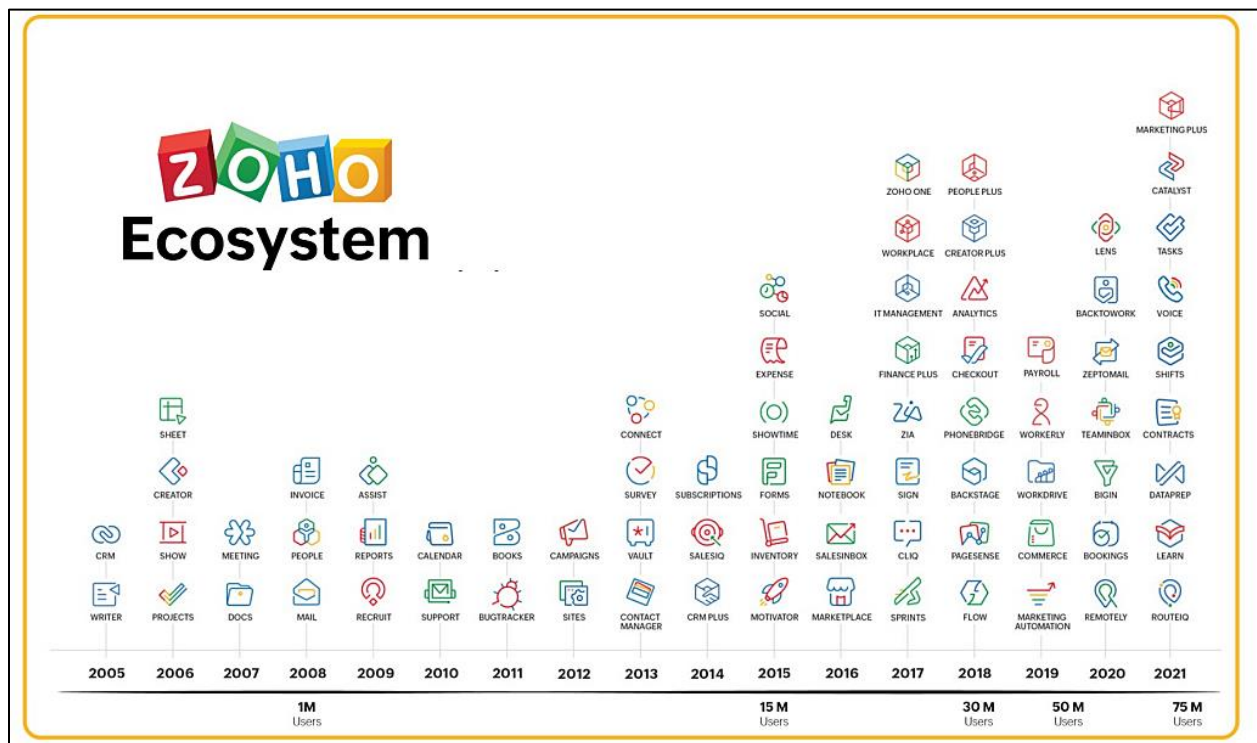


Figure 1. Timeline of Zoho’s software ecosystem expansion (Image courtesy of Zoho Corporation)

ABOUT ZOHO’S GENERAL CLOUD INFRASTRUCTURE

Aiming to fulfill the increasing software needs of its customers, Zoho now orients its efforts to not only expand its functional capabilities but also, through a thoughtful strategic process, bundle its wide range of offerings to reinforce and provide full-fledged solutions for organizations across functional areas and lines of businesses. For example, the [Zoho One](#) offering includes more than 45 cloud-based applications; this is also the case for the newly Zoho Creator Platform.

With the introduction of the new Zoho Creator platform, the company provides a web-based builder for its cloud version and a full-stack installable instance for its on-premises version for enabling all the activities related to the low-code development of process applications.

With the idea—according to Zoho—to:

Empower everyone to easily build powerful applications.

Zoho has developed a complete, layered architecture (figure 2) from the ground up to empower all aspects of its offering in the cloud, from data centers up to the Apps. This starts with an abstracted

database architecture that enables access to major schemas (such as columnar, row base, time series and others) to avoid data exposure up to its design (based on a same technology) to provide consistency across all major technology incorporations such as AI, analytics, SSO, messaging, and more.

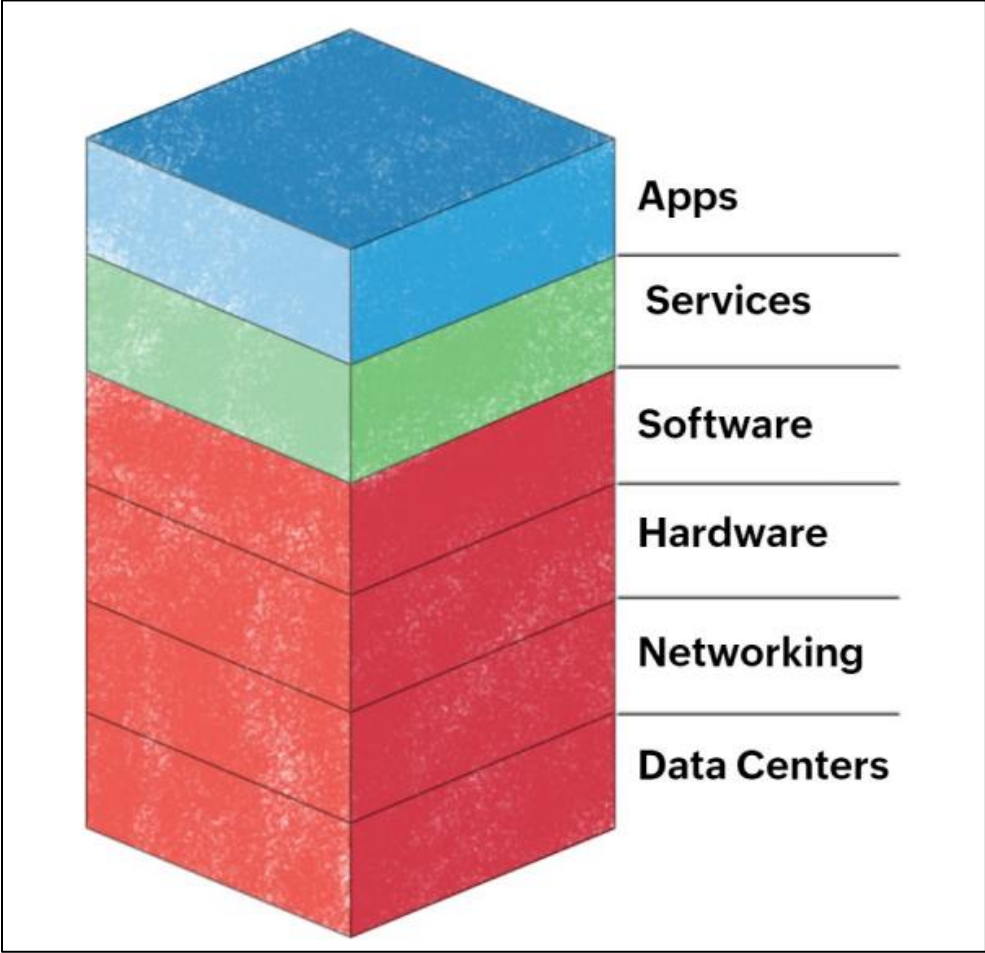


Figure 2. Zoho’s layered unified architecture (Image courtesy of Zoho Corporation)

Along with the core data infrastructure, the Zoho unified file system and core capabilities for network acceleration and monitoring add reliability and power to the complete infrastructure model that serves on the back of Zoho’s new Creator Platform.

Although Zoho’s software stack resides in the cloud, surprisingly Zoho provides a full-stack, installable instance for full on-premises deployments. Alternatively, the company can enable customers with a hybrid model to establish connections between on-premises servers and cloud servers, using webhooks,

application programming interfaces (APIs), and data transfer tools post-installation. Developers can access the development platform via all compatible browsers across operating systems.

ABOUT ZOHU’S CREATOR PLATFORM: GENERAL STRUCTURE

The new Creator Platform empowers both tech savvy and novice users within an organization to easily build powerful and effective business solutions.

With its unified all-in-one low-code platform, Zoho aims to provide what it describes as a *seamless meshed application builder, integration builder, and analytics builder*, which, along with management and control, can provide IT with the capabilities for the three phases of application building: development, deployment, and management (figure 3). The full-fledged, low-code application development platform provides easy access to the necessary tools for the design, development, and execution of business process applications.

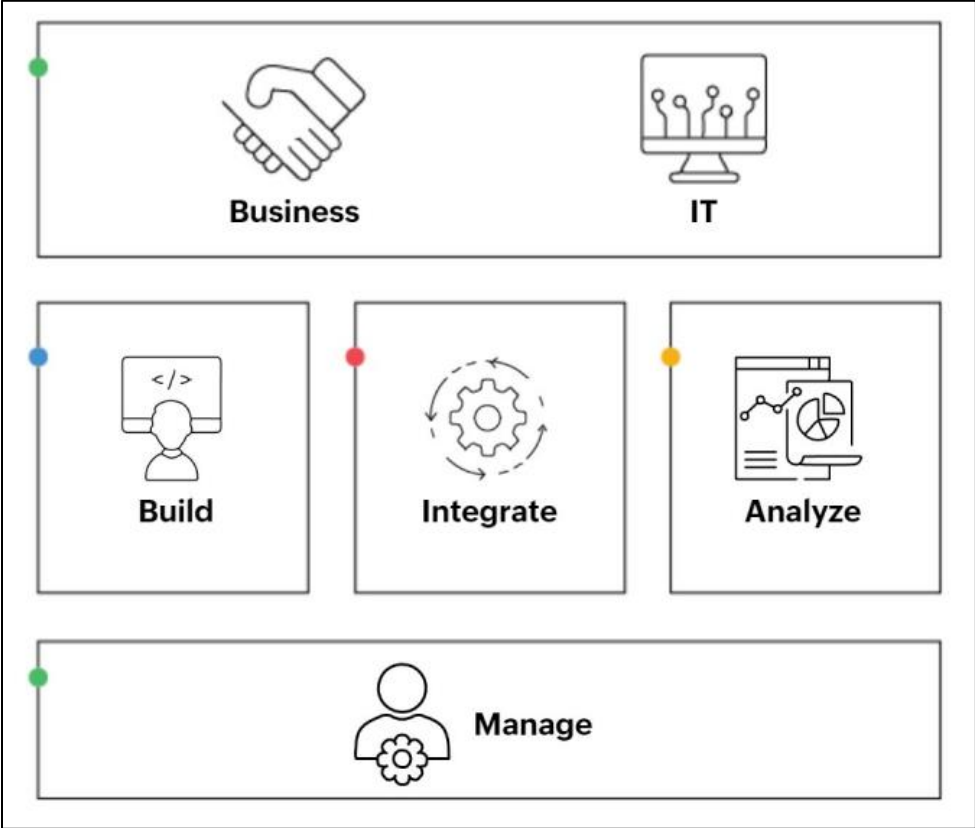


Figure 3. Zoho’s Creator Platform view on low-code development (Image courtesy of Zoho Corporation)

"From an IT perspective, what stands out about the Zoho Creator Platform is how it provides a collaborative environment both for developers and non-technical business users to work alongside one another. The ability to invite users to test out applications in the early stages of development—to test out new features—is a game changer for us. And with new development lifecycle management capabilities, multiple developers on our team can work on an app simultaneously, which speeds everything up."

– Aurélien MORIN, IT Project Manager, Hubsafe

Another key aspect of the new Zoho Creator Platform has to do with integration (figure 4), both the offering's ability to blend with the rest of an organization's enterprise software stack and to integrate the development efforts made by the IT and the business sides of the organization.

A unified data model, more than 600 connectors to third-party applications and data sources, and a clear flow dashboard all enable Zoho Creator to integrate users both within and outside the organization with the rest of the software stack, whether these are other Zoho offerings or third-party systems.

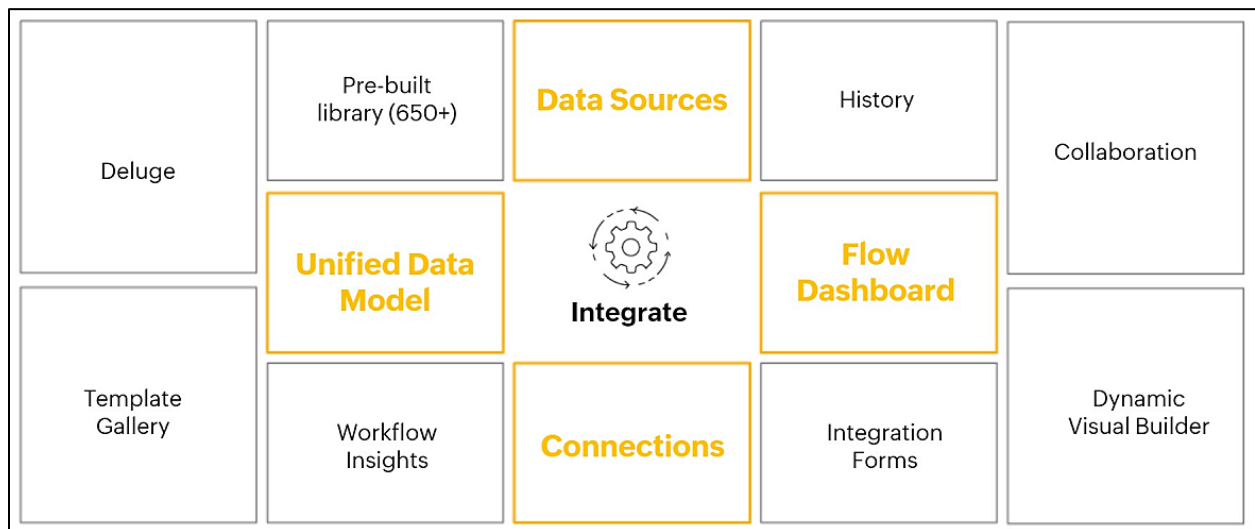


Figure 4. Zoho's Creator Platform integration vision (Image courtesy of Zoho Corporation)

ZOHO CREATOR PLATFORM: CORE FUNCTIONAL ELEMENTS

Let's look now at some of the functional highlights of the Zoho Creator Platform:

Process/Workflow Modeling and Definition

With a visual workflow builder, Zoho Creator can store all automation in a unified place, so that form actions, schedules, approvals, payments, workflows, and blueprints (figure 5), and build custom functions reside on a common place that is easy to manage.

For process/workflow definition, users can use Creator's blueprint builder to design, automate, and optimize simple as well as complex business processes in detail. To this end, Zoho Creator has two key components:

- **Stages**, to establish milestones in a process, and
- **Transitions**, to define intermediate states between two stages awaiting a triggered action.

Moreover, these user-defined rules can be executed during application usage or during a static or dynamic date and time, including notifications, changing corresponding parameter values, and affecting control actions on devices, notifications/triggers, or third-party software.

Zoho Creator's simplified data modeling tool enables users to build complex relational data models simply by using *point-and-click* actions as well as to import models from 11 different file formats (.xls, .csv, etc.)

Via its GUI-based workflow builder, Zoho Creator enables users to define a wide range of *form-specific, rule-based* actions that can be triggered upon loading, receiving user input, or even the submission of a form at each stage—creation, modification, and deletion. Actions such as notifications, data manipulation, and integrations can be configured with simply point and click, and they can be executed with schedules set either at intervals or relative to any date field within the app.

"We use Zoho Creator Platform to build low-cost, bespoke applications that meet the exact needs of the university. Specifically, we have been able to realize cost savings and efficiency by digitizing manual processes, which allows us to spend more time improving the quality of teaching and student experience. Zoho Creator Platform has been a revolution for our business. Its easy-to-use functionality and multi-platform delivery means that we always have up-to-date information from which we can make informed decisions."

– Stephen Harrison-Mirfield, COO,
Royal College of Surgeons in Ireland Medical University Of Bahrain

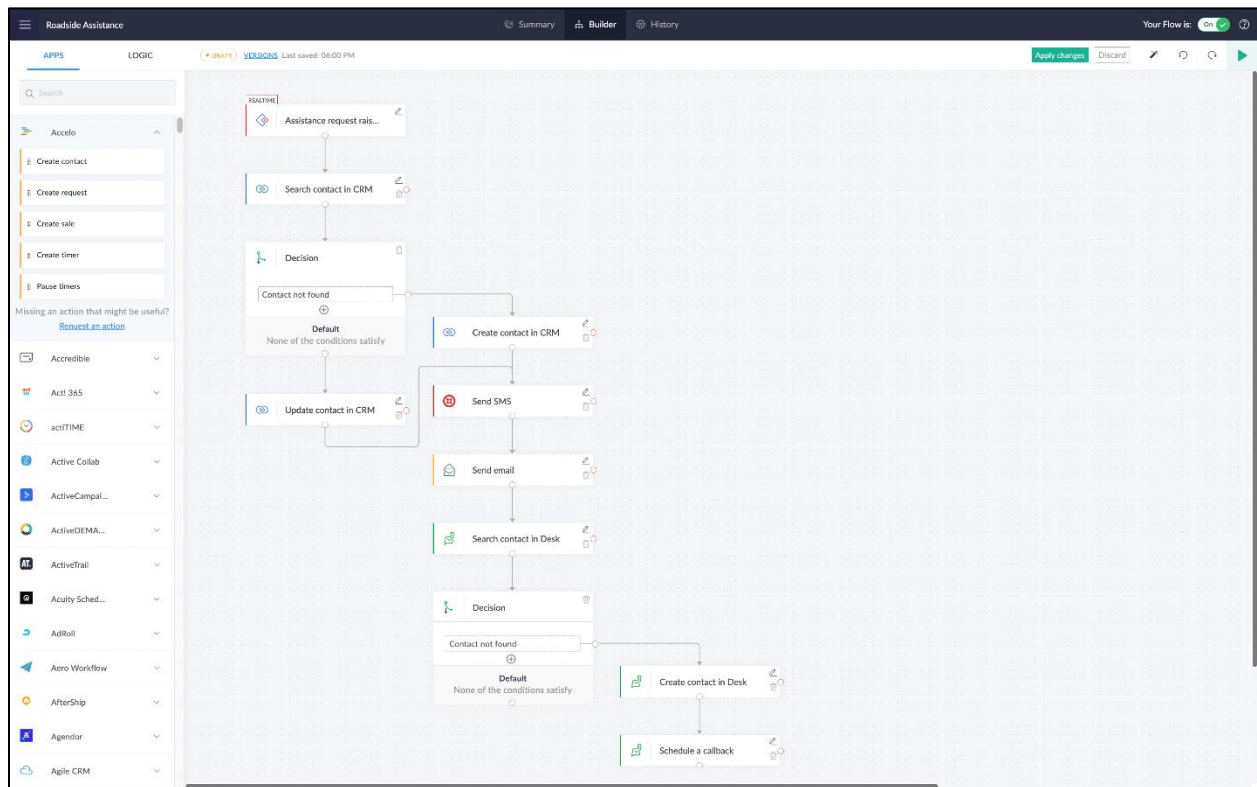


Figure 5. Zoho's Creator Platform process workflow (Image courtesy of Zoho Corporation)

Low-Code Process Application Development

Zoho's new Creator Platform has now a fully redesigned App Creator tool around a true WYSIWYG perspective to be used by business developers (citizen developers) to enhance their overall user experience with building an application.

From offering prebuilt templates to build full apps and components such as forms, pages, and reports to assist developers to offering automated generation of tables, fields, data models, ERD, reports, and more, Zoho Apps can help guide developers through the development process using checks and prompts throughout the builder to flag inconsistencies in real time.

The low-code platform has the option to opt-in to have access to an AI-based tool guide to get tips and tricks based on their engagement with the platform.

The new Zoho Creator Platform also allows for serverless functions, enabling users to execute logical blocks of code without having to implement a complicated server infrastructure.

All these are supported by the same underlying Zoho infrastructure to provide consistency across the platform.

Moreover, professional developers can extend or customize existing and new applications using many of the popular developing tools on the market including Deluge (Zoho's own scripting language), JavaScript, Java, Node.js, or ZML (Zoho Markup Language) as well as with a set of widgets that can be used or developed and be hosted on Zoho servers.

The new Zoho Creator Platform provides building, staging, and production environments with no need for additional setup and, with its sandbox functionality, allows users to build prototypes and execute preliminary testing within a restricted environment, enabling developers to publish changes at will with a single click.

BI & Analytics Creator

Perhaps one of the highlights of new Zoho Creator is the platform's integrated ability to enrich process applications with BI & analytics capabilities through a full-fledged analytics engine.

By taking advantage of Zoho's wide set of BI and analytics capabilities incorporated within the Creator platform, Zoho offers developers the ability to create custom BI and analytics solutions that cover the full process from integration of disparate data sources to the provision of analytics and reporting capabilities by including the following:

- **Integration** of data originating from disparate systems to obtain visibility over business processes—from uploading data from spreadsheets, to connecting to online storage services, such as Zoho Docs, Google Drive, Dropbox, and Microsoft OneDrive, to using APIs capable of extracting data from MySQL servers, Oracle, or another in-house database.

- **Data visualization and analytics** capabilities via a drag-and-drop interface to create interactive reports and dashboards while adding charts, widgets, and pivot tables. The platform also allows using HTML to add contextual information and images to enrich dashboards and visualizations.
- **Use of Zia**, Zoho's conversational AI assistant, to allow users to obtain answers to questions or auto-generate visualizations using natural language—all while Zia learns the user data and business needs over time to help users build key metrics or suggest relevant charts or reports (figure 6).

Zoho Creator allows users to create a wide variety of visual tools, including their own reporting portals and microsites, or to embed relevant reports to their desired platforms—all with options for personalization for brand matching and single sign-on authentication (SSO), for example.

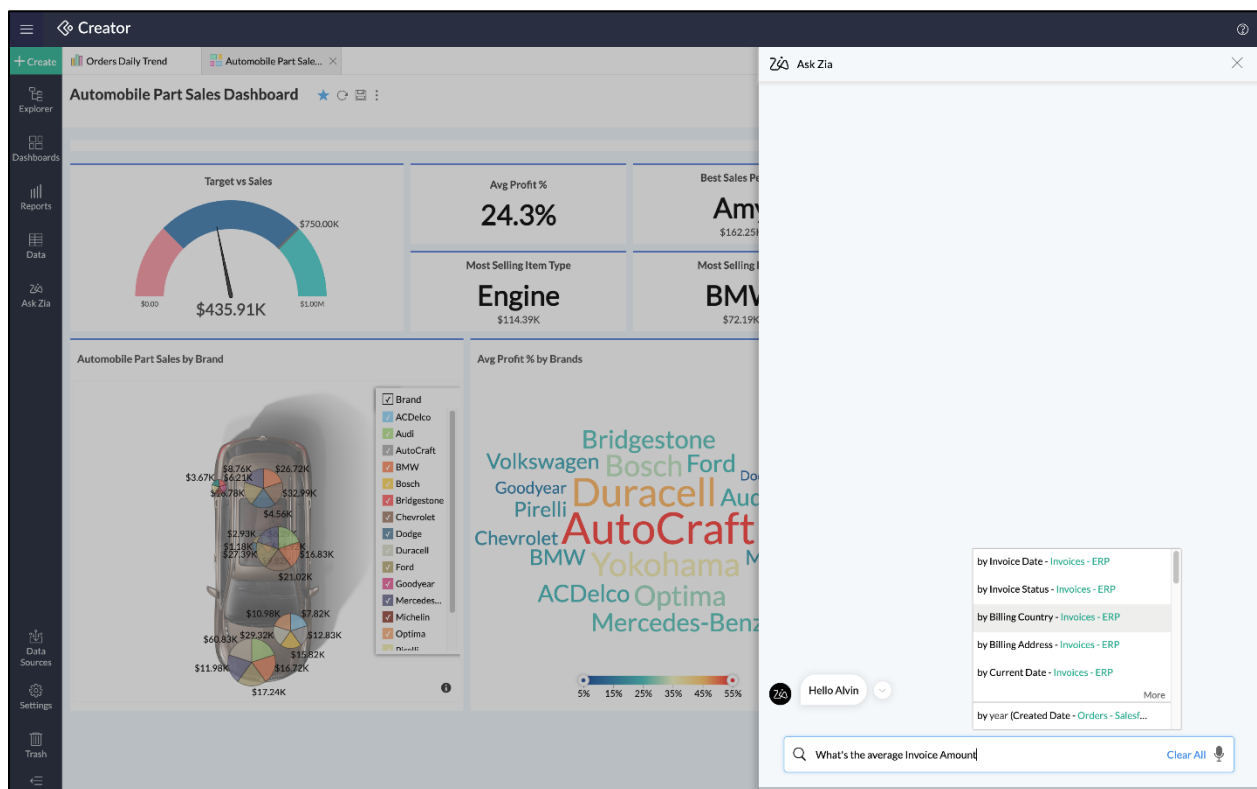


Figure 6. Zoho's Creator Platform dashboard and use of AI agent Zia (Image courtesy of Zoho Corporation)

Finally . . .

The new Zoho Creator Platform is, of course, not limited to the features we have already highlighted. Additional elements include capabilities for collaboration, as well as full-fledged capabilities for developing applications for mobile devices, and data preparation and blending—all under the Zoho umbrella for account administration and management as well as security.

The new Zoho Creator Platform has been built to provide companies of all sizes with a full-fledged, low-code development platform for organizations of all types and sizes.

ZOHO LOW-CODE PLATFORM: A NEWCOMER FOR A NEW WORLD

The new Zoho Creator Platform, another key advancement to the Zoho stack, represents the company's effort to transform and widen the way Zoho delivers solutions to its customers—by providing end-to-end solutions in the form of platforms to create complete sets of solutions.

By smoothly blending existing and new state-of-the-art technologies and a thoughtful business approach, Zoho Creator Platform appears to be a well-prepared offering for effective low-code application development. Zoho Creator Platform can deliver significant benefits to an organization looking into increase its operational efficiency—by lowering operational costs with the development of new process software applications.

During our review of Zoho's new Creator Platform it was immediately apparent that Zoho has allowed for the cohesion of all its components and the solid integration between the platform and third-party applications.

About the Author



[Jorge García](#) is TEC's Principal Analyst, Business Intelligence (BI) and Data Management. He has more than 20 years of experience in all phases of application development, database and data warehouse (DWH) design, as well as 9 years in project management, covering best practices and new technologies in the BI/DWH space.

Prior to joining TEC, García was a senior project manager and senior analyst developing BI, DWH, and data integration applications with Oracle, SAP Business Objects, and data integration. He has also worked on projects related to the implementation of BI solutions for the private sector, including the banking and services sectors. He has had the opportunity to work with some of the most important BI and DWH tools on the market.

García is a member of the [Boulder BI Brain Trust](#).

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