

An enterprise guide to the changing landscape of *application development*

A comparative study of **full stack** and **low-code** application development

In software development, the choice between traditional full stack development and low-code application development has become a pivotal decision for organizations seeking efficiency, agility, and cost-effectiveness. This white paper explores and compares the two methodologies, shedding light on their characteristics, shortcomings, and the spectrum of solutions they enable. Through a comprehensive analysis, we delve into the significance of building custom solutions using low-code. This paper aims to provide a nuanced understanding of the trade-offs involved and guide enterprise decision-makers in choosing the right approach for their unique needs.

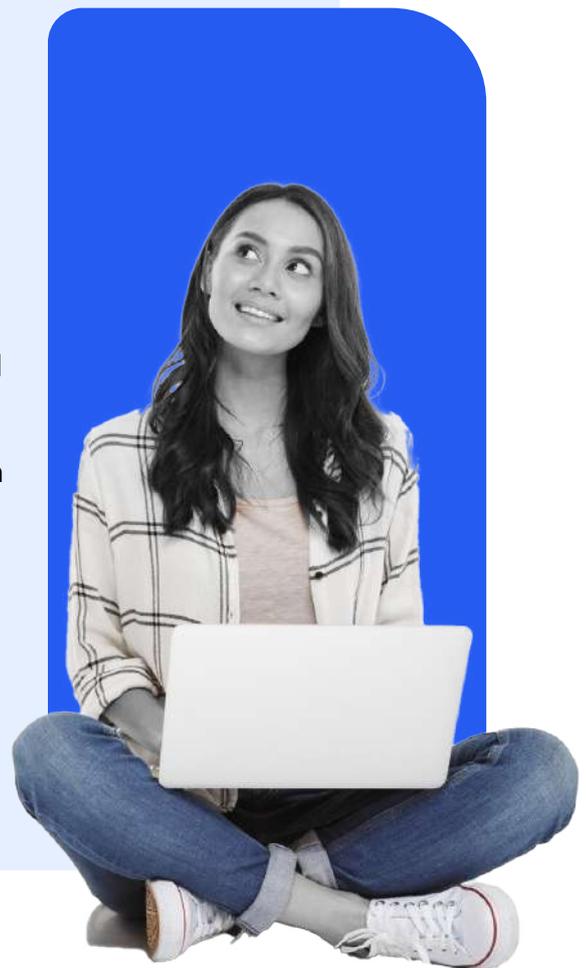


Table of Contents

Defining full stack development	03
Understanding low-code application development	04
Comparative analysis: Full stack development vs Low-code application development	06
Low-code from an enterprise angle	09
Enterprise low-code success stories	11
The spectrum of solutions enabled by low-code	16
Future trends	19

Defining full stack development

Full stack development refers to end-to-end software development, where developers are proficient in both front-end and back-end technologies, enabling them to work on the entire spectrum of an application. The process involves the design, implementation, testing, and maintenance of both client-side and server-side components.

-  **Front-end development** deals with the user interface and user experience. Full-stack developers work with technologies like HTML, CSS, and JavaScript, to create visually appealing interfaces.
-  **Back-end development** involves managing server-side operations, databases, and server logic. Developers are familiar with server-side languages like Node.js, Python, Ruby, and database management systems.
-  **Database management** involves handling databases and ensuring efficient data storage and retrieval. Full-stack developers work with databases such as MySQL, MongoDB, or PostgreSQL.
-  **Version control** involves using systems like Git to track changes and collaborate with other developers.
-  **Deployment and maintenance** involves deploying applications and managing ongoing maintenance, ensuring smooth functioning and addressing any issues that arise.

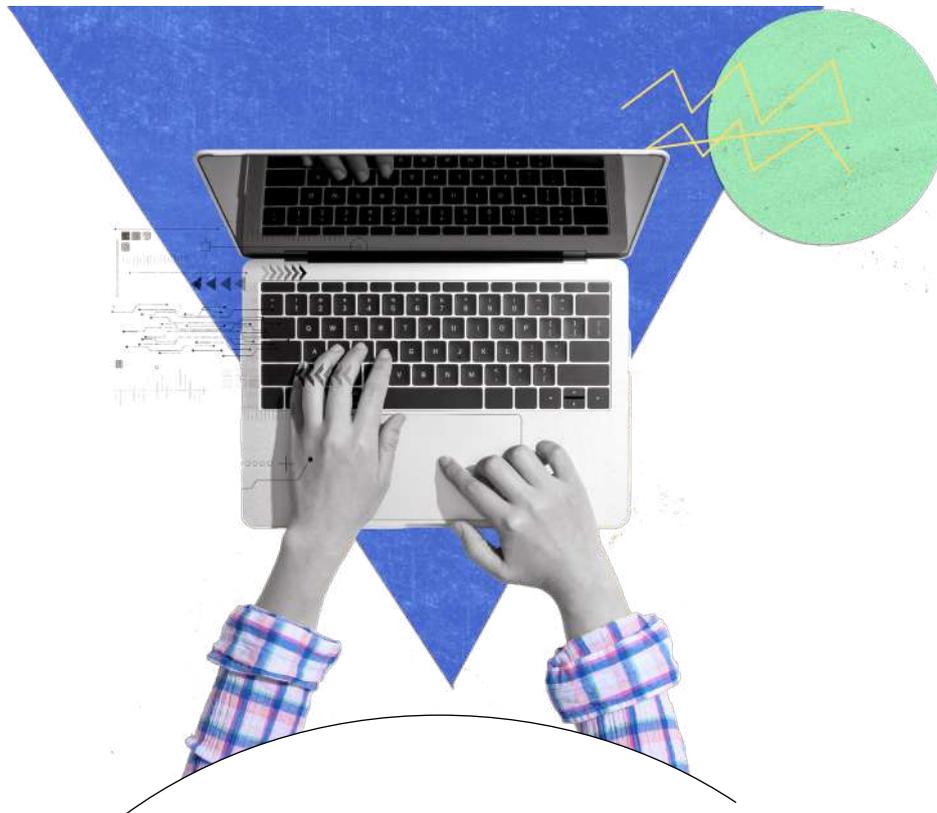
One significant advantage of full stack application development is the control and flexibility it provides to developers. Full stack developers are proficient in both front-end and back-end development, handling the entire web development process. They work on the client side (user interface) and server side (server logic and database), ensuring end-to-end functionality.

However, full stack developers need to stay up to date with a broad range of technologies, programming languages, and frameworks. The constant evolution of these technologies poses a continuous challenge, making it demanding for developers to remain proficient in both front-end and back-end development.

Understanding low-code application development

Low-code application development is a modern approach to software development that enables users to design and build applications through graphical elements rather than traditional coding. These interfaces often include drag-and-drop components, form designers, prebuilt templates, and visual workflows. This approach aims to accelerate development, making it more accessible to a broader audience and promoting collaboration between developers and non-developers.

It reduces the number of steps in the app development process—compared to traditional methodologies—by abstracting away much of the manual coding and automating various aspects of development.



Here's a brief overview of the process:

 **Requirements gathering:**

Clearly define the requirements of the application, including functionality, user interface components, roles, and permissions.

 **Visual design:**

Use the low-code platform's visual tools to design the user interface and drag and drop elements to create forms and reports. These platform-specific dashboard and page builders grant a WYSIWYG experience, ensuring the design aligns with your vision.

 **Workflow design:**

Implement business logic and workflows using visual programming to automate processes. For instance, Zoho Creator's Deluge scripting language simplifies complex logic implementation with its unique drag-and-drop code snippet IDE.

 **Testing:**

Test the application directly within the low-code environment, eliminating the need for separate testing teams. Features like lifecycle management simplify version history management, contributing to a robust testing phase.

 **Deployment:**

Seamlessly deploy the application to web, iOS, and Android platforms.

Low-code application development platforms shine in their ability to accelerate the development process. By providing a visual interface and prebuilt components, low-code platforms empower users with varying levels of technical expertise to create applications rapidly. This streamlines the development lifecycle, reduces the need for extensive coding, and allows business users to contribute to application development.

While this democratization of application development can be advantageous, it also can lead to the creation of solutions that operate outside the purview and control of the IT department. Organizations need to implement proper governance and oversight to ensure that low-code development aligns with IT policies, security standards, and overall organizational goals.

Comparative analysis: Full stack development vs Low-code application development

To conduct a comprehensive comparison between full-stack and low-code development, we'll evaluate them based on the following criteria:

Criteria	Full-stack development	low-code development
Skill requirements and learning curve	Steeper learning curve as developers need to acquire proficiency in multiple technologies and frameworks, including front-end and back-end development.	Shorter learning curve, making it accessible to individuals with less coding experience, and reducing the barrier to entry. Skills required include understanding visual development tools and basic logic.
Development speed	Requires more time for coding and configuring each layer of the application, resulting in a longer development cycle.	Offers faster development, as it involves visual development tools and prebuilt components. Rapid application development is a key advantage, enabling quicker building and deployment.
Scalability	Highly scalable, as developers have control over optimizing each layer for performance.	Scalability might be limited by the capabilities of the low-code platform. Advanced scaling may require traditional development.

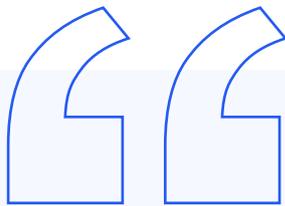
Criteria	Full-stack development	low-code development
Maintenance	Requires ongoing maintenance of both front-end and back-end components. Developers have more control over updates and optimizations.	Maintenance is generally easier, as the low-code platform handles updates and compatibility issues.
Cost	Typically higher initial development cost due to the need for skilled full stack developers. Ongoing costs may include salaries and infrastructure.	Lower initial development cost, but ongoing subscription fees for the low-code platform can add up, but is more cost-effective in the long term for large-scale projects
Security	Developers have more control over implementing security measures at both front-end and back-end layers.	Includes built-in security features, and developers must adhere to platform-specific guidelines. The platform's security features and practices are crucial for overall application security.

The choice between the two methods depends on project requirements, complexity, timeline, budget, and the skill set of the development team. Full stack offers a comprehensive approach but demands a higher level of expertise. On the other hand, low-code development streamlines the process and abstracts coding complexities, making it more accessible and economical.

For instance, let's take the case of **MGM Healthcare**, a multi-speciality hospital that uses Zoho Creator, Zoho's low-code platform, to digitize its core operations.

Imagine a developer who needs to create a hospital management application for the hospital. With traditional development methods, the developer would have to start from scratch, writing code for each functionality of the solution, such as facility management, surgical and biomedical services, patient management, electricity, water consumption, and environmental monitoring. This process could take months or even years to complete.

However, with Zoho Creator, the organization took just three months to deploy solutions and another three months to stabilize operations. The prebuilt components and drag-and-drop interface made it easy to add or modify features, saving a significant amount of time and effort.



We wanted to digitize and automate every activity and process at our hospital, so staff and doctors could minimize the use of paper, Excel sheets, WhatsApp messages, and phone calls. We were looking for a tool that could help us achieve this very quickly, at an affordable price,

-Harish Manian, CEO of MGM Healthcare.

By adopting low-code, MGM Healthcare was able to reduce its development costs by 15% compared to traditional development methods. This significant cost reduction allowed them to allocate additional resources to other critical areas of their operations.

Low-code from an enterprise angle

Low-code technology is a strategic enabler for enterprises looking to drive digital transformation, enhance productivity, and respond quickly to market changes. The scalable and collaborative nature of low-code makes it a valuable asset in the modern enterprise landscape.

Gartner predicts that, **by 2026, developers outside formal IT departments will account for at least 80% of the user base for low-code development tools, up from 60% in 2021.**



Here's a closer look at how low-code benefits enterprises:



Agile development and faster time to market:

Low-code aligns with agile development methodologies. Enterprises can quickly adapt to changing business requirements, receive rapid feedback, and iteratively enhance applications. The rapid development cycles also facilitate faster time to market for new applications.

According to Red Hat's Pathfinder report, "**no-code and low-code platforms help reduce app development time by 90%.**"



Cost efficiency and resource optimization:

Enterprises can achieve significant cost savings by reducing the dependency on highly specialized developers. With low-code, a broader range of individuals can contribute to development efforts, optimizing resource utilization and lowering development costs.

According to Forrester's 2023 Global Digital Process Automation Survey, **"84% of businesses are adopting low-code or no-code tools to fill the technical gap left by the shortage of developers."**



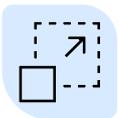
Integration capabilities:

Many low-code platforms come with built-in integration capabilities, simplifying the process of connecting with existing systems and third-party services. The applications can seamlessly integrate with the enterprise's existing IT infrastructure and upcoming technologies.



Risk mitigation and compliance:

Low-code platforms often include enterprise-grade security features and adhere to compliance standards, reducing the risk of vulnerabilities. This is vital for enterprises operating in regulated industries that follow strict compliance, data protection, and security regulations.



Scalability and future-proofing:

Low-code applications scale as the enterprise grows, and can handle increased user loads, additional features, and evolving business requirements.



Centralized management and governance:

Low-code platforms provide centralized management and governance capabilities, allowing enterprises to oversee and control the entire application development process, ensuring consistency and the efficient management of resources.

According to Forrester, **"compared to conventional app-building platforms, no-code solutions consume 70% fewer resources."**

Enterprise low-code success stories

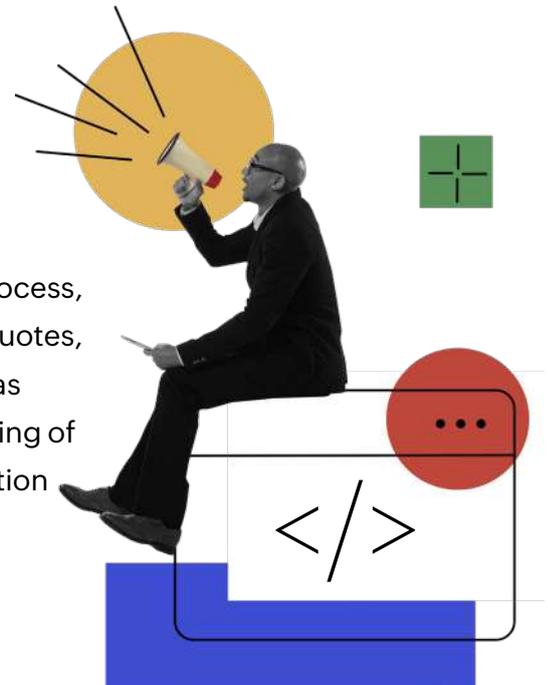
Let's explore how several enterprises have effectively digitized their operations through the strategic utilization of a low-code application development platform like Zoho Creator.



Tata's BigBasket automates CapEx procurement with ERP built on Zoho Creator

BigBasket, India's leading online grocery store with over twenty million customers and thirty million monthly visitors, undertook a transformative initiative by implementing a customized budget-to-procurement-to-pay ERP with low-code.

The tailored ERP streamlines their entire CapEx management process, providing a unified workflow for budget planning, SKU codes, quotes, bills of materials (BOM), and GST details. The implementation has significantly enhanced accountability by enabling precise tracking of fund utilization. With around six thousand daily orders, this solution marks a pivotal step in automating and optimizing BigBasket's procurement operations.



We want to replicate Zoho Creator for our operational expenditure (OpEx) model because, currently, we're only using it for CapEx. We want to utilize AI capabilities such as OCR, so that whenever a vendor submits a tax invoice, fields like invoice number and amount get extracted. Then they should automatically receive quantities for the SKUs based on that.

-Vinayaka Gangavati, Head of Procurement, BigBasket

The custom CapEx procurement ERP encompasses modules such as budget planning, automated inventory management, centralized CapEx approval for purchase requisitions, CapEx purchase order creation, GST calculations, vendor portal, invoice processing, real-time dashboards, roles and permissions, and a savings calculator. These modules collectively resulted in a 50% reduction in task completion time, improved productivity by 1.5 times, and saved approximately \$360K USD.

[Read the full story here.](#)



Lalamove builds a safety incident management platform using Zoho Creator

Lalamove, an Asia-based logistics company, faced challenges in managing safety incidents efficiently across its diverse markets. Initially using ticketing software for case reviews, the safety team struggled with one-sided documentation and lacked collaboration with other teams.

To address this, Lalamove implemented Zoho Creator to build the Safety Incident Management Platform (SIMP). The platform enables the safety team to record incident details comprehensively, facilitate investigations, communicate with various departments, and achieve resolutions. The internal reporting form in SIMP categorizes incidents by priority, streamlining the process for incidents of varying severity.



Zoho Creator has helped us a lot. Every few months, we come up with new feature requests or ideas that we incorporate into the app. The more we use the app, the more changes we make to it to help fix a problem, make something better, or simplify a task.

- Danny Lo, Senior Manager, Operations Safety, Lalamove

The solution proved instrumental in overcoming operational challenges for Lalamove. It facilitates better collaboration among teams by consolidating incident information in a single place, and allows for efficient tracking of progress and follow-up actions by the driver operations team. Additionally, SIMP empowered Lalamove to leverage data for insights into safety-related performance metrics, enabling more informed decision-making.

[Read the full story here.](#)



MTN simplifies data management with low-code

MTN, a major African telecom operator with over 223 million subscribers across 24 countries, faced challenges during the pandemic-induced increase in data volume. Manually collecting data led to inconsistencies, and the lack of real-time insights hindered business growth.

To address these issues, MTN implemented Zoho Creator to build BooM—a cloud-based automation tool. The app's streamlined workflows ensured data accuracy and enhanced operational efficiency, going live in just three months with 400 users across the Middle East and Africa.



If you want to be agile, have a non-complex solution, and go live quickly, without having integration and implementation difficulties, then Zoho Creator is the perfect solution.

- Laila Kakar, Lead Data Scientist, MTN

Zoho Creator's built-in AI restricted input to relevant data, improving accuracy—and automatic notifications and audit trails enhanced security and transparency. Real-time dashboards also streamlined the interpretation of data, providing MTN with up-to-the-minute information. This, combined with the app's inherently user-friendly design, contributed to high adoption rates among users.

[Read the full story here.](#)



How Tectonic Financial is transforming its business with low-code

In 2020, the global COVID-19 pandemic triggered a rapid shift in daily life and business operations worldwide. The US government, under the CARES Act, introduced the Paycheck Protection Program (PPP) to address the economic impact, specifically targeting small businesses. Banks then faced the unprecedented challenge of implementing end-to-end commercial lending apps in just two weeks, in order to participate in the PPP.

Traditional software development methods were inadequate, and low-code technology emerged as the only viable solution. T Bank, a community bank under Tectonic Financial, rose to this challenge, leveraging Zoho Creator to develop and implement the PPP application within a tight two-week deadline.



We've built a wide variety of successful applications on Zoho Creator over the past few years. With the extensive set of tools available in Creator and the broader Zoho One suite, we knew we could pull together an application that exceeded expectations in a very short time.

- David Clifford, Chief Strategic Officer, Tectonic Financial

The PPP application involved three key components: a user interface for applicants, back-office processing, and a mechanism to submit applications to the Small Business Administration (SBA). The bank also achieved significant cost savings, streamlined processes, and extended its low-code utilization beyond PPP, showcasing the enduring benefits of embracing low-code solutions in the financial sector.

[Read the full story here.](#)



RCSI: Reforming education through digitization

The Royal College of Surgeons in Ireland - Bahrain, a leading health sciences institution, faced challenges in managing extensive data on students, staff, and alumni, stored mainly in error-prone spreadsheets. The university needed a solution to streamline data management and reduce manual errors.

Implemented in 2017, Zoho Creator transformed the university's operations, replacing spreadsheets with over 50 custom applications. This shift led to significant improvements in data quality, accessibility, and operational efficiency. The university transitioned from manual admission processes to automated workflows, saving time and ensuring accurate data input. Zoho Creator's cloud-based features allowed global access to data, facilitating collaboration and decision-making with virtually every department adopting the applications, making RCSI Bahrain a more efficient and data-driven institution.



Zoho Creator has been a revolution for our business. Its easy-to-use functionality and multiplatform delivery means that we always have up-to-date information, which allows us to make informed decisions.

- Stephen Harrison-Mirfield, COO, RCSI

Low-code not only addressed the university's immediate challenges but also opened avenues for innovation. Custom applications—including Research & Audit Management, Alumni Systems, and Exam Timetabling—were developed to cater to specific departmental needs. The transition from spreadsheets to workflows further helped the university focus on enhancing teaching quality and student experiences.

Read the full story [here](#).

The spectrum of solutions enabled by low-code

From core systems that form the backbone of business operations to specialized applications addressing unique needs, low-code offers enterprises a powerful toolset to build and deploy solutions rapidly.

The types of applications you can build using low-code platforms can be broadly classified into four distinct categories. They are:



Internal tools

Enable rapid application development and build scalable internal tools for all your organizational needs. Improve internal collaboration, approval processes, and productivity while automating tasks with internal tools.



Portals

Build self-service portals that can facilitate customers, vendors, business partners, and others—who need a single point of access to your products, services, and information.



Core systems

Build core systems that range across many operational areas, such as field service management, supply chain management, franchise management, and enterprise resource planning.



Extend existing and 3rd party applications

Low-code can be used along with your existing system and seamlessly integrated with a third-party system to customize them for your unique use cases.

Here are some examples of solutions you can build using low-code platforms like Zoho Creator:



Enterprise resource planning (ERP)

ERP systems that are crucial for streamlining business processes can be developed efficiently with low-code. Custom ERP solutions for finance, HR, and inventory management offer a modular and scalable approach, allowing organizations to adapt and grow without the complexity associated with traditional ERP implementations.



Supply chain management

Tracking the entire supply chain can be cumbersome, but low-code platforms simplify end-to-end management and enhance operational efficiency with real-time visibility, inventory optimization, and demand forecasting.



Finance and accounting systems

Low-code is instrumental in developing custom financial systems that automate accounting processes, budgeting, and financial reporting. Platforms like Zoho Creator allow for easy integration with existing financial tools and compliance with industry standards.



Customer feedback and survey applications

Gathering and analyzing customer feedback is simplified with low-code survey applications. Businesses can quickly design and deploy surveys to collect valuable insights and use the collected data to create extensive reports for a comprehensive view of customer experience and satisfaction.



Learning management systems (LMS)

Enterprises can use low-code to build personalized, scalable, and feature-rich learning management systems (LMS) that facilitate employee training and development. They can easily customize learning paths, content delivery, and progress tracking, ensuring that the LMS aligns with the organization's unique training objectives.



Governance, risk, and compliance (GRC) solutions

Low-code offers an agile route, empowering businesses to create tailored GRC solutions. From risk assessment modules to compliance tracking, low-code streamlines processes while ensuring adaptability to evolving regulatory landscapes, fostering a proactive compliance culture across the enterprise.



Data center management

Database management systems built using low-code centralize monitoring, automating tasks like resource allocation and security protocols. Real-time insights into server performance, energy consumption optimization, and predictive maintenance become accessible, improving data center management efficiency.



Ad-hoc solutions

Whether it's a sudden change in business processes, the need for a quick reporting tool, or a novel solution to a unique problem, low-code platforms empower users to prototype, iterate, and deploy on-the-fly solutions rapidly.

And the list doesn't end here. Low-code empowers enterprises to build virtually anything, provided they have a clear set of requirements. It helps translate well-defined business needs into functional applications with minimal hand coding, accelerating the development process.

Future trends

The choice between full stack and low-code development boils down to striking the right balance between control and speed, complexity and simplicity. Full stack development provides a robust foundation for intricate projects, catering to the meticulous needs of developers.



On the other hand, low-code app development is a game-changer for enterprises seeking rapid application development and cost-efficiency, empowering a broader range of contributors in the development lifecycle.

What sets low-code apart is its unique ability to incorporate new and emerging technologies easily. Whether it's artificial intelligence, machine learning, augmented reality, or other cutting-edge solutions, low-code platforms provide a flexible environment for developers to integrate these technologies into existing applications.

As the digital landscape continues to evolve, the synergy between low-code development and upcoming technologies positions it as a catalyst for enterprise transformation, driving efficiency, collaboration, and an accelerated time to market. It enables enterprises to stay current and take advantage of innovations without undergoing a complete overhaul of their development processes.

About Us

At Zoho Creator, we've always worked towards a single purpose—empowering users to build functional apps with minimal coding expertise. We've helped **14,000+** brands create bespoke solutions and improve their end-to-end operations across a variety of industries. With over **16 years of experience** in catering to **B2B and B2C organizations**, we have the best tools in the trade to help you improve your business.

You can get started with Creator by visiting our **signup page**. You can also check out our **prebuilt apps** to get started right away.





www.zoho.com/creator

We'd love to talk!
Reach out to us

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