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LOW CODE/ NO CODE DEVELOPMENT

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ABSTRACT: A software development technique known as "low/no-code" gives users a platform to visually create programs with little to no coding. For a variety of business needs, such as management in the technological age, businesses and organizations require software programs and information systems. With the help of low-code development, non-IT specialists can easily and quickly create the basic business applications they require, either completely or partially, without writing any code. Low Code/No Code (LC/NC) development is revolutionizing the software development environment by offering a platform that makes it possible for users to efficiently create applications with little to no programming skills. This report explores the main facets of LC/NCdevelopment, including its benefits, drawbacks, and potential directions.

Keywords: [Low- Code, No-Code, Software Development, Productivity, Innovation, Traditional Development, Software Development Life Cycle (SDLC).]

1. INTRODUCTION

The term "no-code" refers to a software development approach that uses visual drag-and-drop interfaces in place of code to create applications and websites. To put it another way, anyone can construct on the internet with no-code, regardless of their level of technical proficiency. Furthermore, by "building on the internet," we imply setting up your own framework to implement your web-dependent project ideas. It may be an online store, game, community, software, or something else entirely.The foundation of the no-code movement is the idea that everyone should haveaccess to technology instead of just those with specialized skills. The no-code movement is based on the idea of a society in which anyone can easily establish a business, develop a mobile app, or automate every aspect of their operations.Not that long ago, the only people who could create an app were expert developers or those who could afford to pay them thousands of dollars. An

app idea from the average person would usually be rejected because they lack theresources and expertise to see their idea through to completion.

However, all of that is changing because of the quick development of platforms, tools, and apps that let regular people create practically anything. Furthermore, we're not limited to talking about business owners and non-technical founders. These days, most companies are, at least

partially, software companies.The way individuals design, start, and manage internet-based enterprises is evolving due to no-code. This isallowing for unprecedented use of the internet.Anybody can construct digital apps with no-code software development without having to write a single line of code. It entails utilizing tools with a simple drag-and-drop interface to come up with original solutions to problems. The end solution can take many different forms, such as creating websites and apps for mobile, voice,or e-commerce, or it can automate many jobs and procedures.No-code, rather than being limited to developers and engineers, is essentially an extension of code that basically makes computer manipulation easier for the public.The primary characteristic, though, is that it adds an abstraction layer, allowing the user to see only theinformation that is necessary for them to know. A fundamental idea can be transformed into a fully functional visual app by anyone using no-code platforms. Code knowledge is not a prerequisite for citizen developers as they can create web and mobile applications by connecting and dragging application components. If you have a no code platform on yourside, it makes no difference if you're a business analyst, citizen developer, small business owner, professional developer, or someone with no technical background. Combining components with APIs to create useful apps is made easy with the help of a no-code platform's intuitive interface. The idea of using outdated technology is removed from the organization.

1.1 Low Code

A visual method of developing software called "low-code" requires less hand-coding and allows for the release of apps more quickly. Traditional computer programming techniques are no longer necessary becauseof the automation of certain development processes provided by low-code platforms' graphical user interface and drag-and-drop functionality. For "citizen" developers—business users with no professional coding knowledge, includingproject managers or business analysts—low-code platforms democratize app development. By decreasing shadow IT, eliminating backlogs in the IT department, and granting less technicalstaff members greater control over business process management (BPM) workstreams, these solutions allow them to have a greater business impact. Still, more experienced programmers can benefit from low-code development platforms as well. They offer additional versatility because they practically require no coding

knowledge. Key Features: Visual Design, Template options, API Ease, Code Extra.

1.1 No Code

Software development using the "no-code" methodology allows for the rapid creation of applications with little to no programming knowledge. Thus, software applications like a form or website can be created, or functionality added to an existing site or app, by line of business (LOB) employees who understand the business requirements for an app and have the requisite institutional knowledge but are not familiar with programming languages.To facilitate quick product delivery, no-code software development separates logic from programming languages and syntax and instead uses a visual approach. Low-code development and no-code development are comparable in this regard. The primary distinction is that professional developers frequently use low-code platforms within an enterprise IT department; in other words, low-code platforms use less abstraction, i.e., they involve some coding and require some knowledge of programming languages. Key Features: Lots of Templates, User-friendly, Simple integrations, All visual methods.

1.2 Reasons for Using Low/ No Code

• The trend known as no-code/low-code is based on the idea that technology thought to be available to everyone, not just those with specialized skills.

• It enables line of business managers to manage technological requirements without ever needing to write code, including automating procedures, creating shared document repositories, building reporting dashboards, and processing data.

• Changes can be made quickly and easily using no-code or low-code development.

• With the help of this creative strategy, anyone without coding knowledge can easily design and constructwebsites, mobile apps, and software applications.
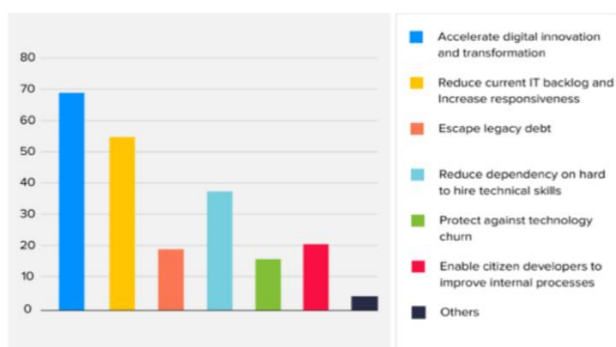

Figure: Main causes for using low-code development platforms.

• No/low code tools are designed to be quick and effective by removing the challenge and intricacy of coding from the process of creating a finished good.

2. Evolution of Low-Code/No-Code Development

A notable change in the landscape of software development has been brought about by the evolution of low-code/no-code development. This creative method makes it possible for people with different technological backgrounds to develop applications without having to get involved in intricate coding procedures. From simple visual programming tools throughout time to powerful platforms with drag-and-drop interfaces, pre-built components, and seamless interactions, the idea has changed. Low-code/no-code platforms have become more popular as companies place a higher priority on agility and quick deployment. These platforms speed up the development cycle, cut expenses, and allow both developers and non-developers to work together. This move demonstrates the industry's dedication to democratizing application development, opening it up to a wider audience and fostering a new wave of creativity in the process.

3. FEATURES OF LOW/ NO CODE

• **Drag-and-drop interface and visual modeling:**When compared to traditional coding, the process of developing an app is much accelerated by using visual methodologies and models. The code is more understandable and easier to use because it doesn't have any built-in modules. Regardless of experience level, anyone can easily operate it.

• **Modular reusability:** Utilizing pre-configured components for your app is another benefit of no-code development. It is possible to construct an effective app development process from beginning to end by reusing the no-code development modules to produce a variety of solutions.

• **Integration of databases and APIs:** For any organization, front-end and back-end connectivity is essential. Databases, back-end services, and other API connections are all part of a no-code platform. The process of developing apps could be sped up with the help of these connectors. A no code platform's ability to integrate seamlessly is its primary strength. Simple modules are available from No CodeDevelopment to let you integrate your API with the least amount of complexity.

• **Simplifying the Software Development Life Cycle:** By decreasing testing, debugging, and deployment, no code development reduces development time. Furthermore, all the data pertaining to the functionality and operation of their apps is accessible to developers. Using version control options, they can also revert to earlier versions at any moment.

• **Governance and Scalability:** Easy scalability is another great aspect of No-code development, enabling customers to build new apps according to the size of their clientele and business. Help them track engagement and growth, two business critical KPIs, with relative ease.

• **Rapid deployment across multiple form factors:** With certain no-code platforms, you may rapidly develop apps for the web, mobile, and tablet. App developers may see how their apps will appear on different screens and configure their frontend with the help of a strong designer before to launch.

4. Comparison of Low Code / No Code

• The Primarily objective of low code is to increase the speed of development and No code is to ease of use.

• In Low code development coding will be present but it is low but in no code development coding is not required.

• Low code development allows foe customization and in no code, user should use pre- built templates.

- Low code allows user to move freely between the platforms and no code doesn't allow this it will be sometimes locked in same platform.
- Using low code users can create complex applications but with no code development only one can create simple apps.
- The purpose of low code is to provide next-gen rapid application development tool for professional developers and no code allows only to create self service applications for business users.

5. Comparison between Low/ No Code and Traditional Development
A. Definition
1) Low/No code is a visual approach that uses prebuilt components and drag and drop interfaces to build app.
2) Traditional software development is an approach to software development that involves creating apps through manual coding.

B. Tools
1) Rapid application development tools such as Kiss flow Low-Code are used and Drag Drop interface are used for low/ no code development.
2) Web frameworks and programming languages such as Python, Java, and PHP are used in traditional development.

C. Coding Knowledge
1) In Low/ Code development basic coding knowledge is sufficient for the user.
2) Advanced coding skills are required to the user while using traditional development method.

D. Speed of Development
1) A working app can be created in less than a month by using low/ no code platforms.
2) In traditional method App development may take 6 months to 1 year.

E. Customization
1) Customization is limited in low/ no code development.
2) In traditional development customization is unlimited, user can create applications according to his ideas.

F. Cost
1) In low/ no code cost will relatively low, one should only need to pay for access and minimal labour.
2) Cost are higher in traditional development as app should be created from scratch.

G. App Performance
1) Standard applications can be created by low/ no code development.
2) App performance will be high in traditional development.

6. Applications
Usually, no-code is used to create basic apps for a single purpose or to add little features to an already-simple website or app. As examples, consider:
- Build software features for business, such as websites, databases, job boards, marketplaces, newsletter, client portals and more.

- Back-office apps, such as invoice processing and KPI monitoring.
- Web applications, such as online shopping and restaurant reservations.
- Mobile applications thatlet workers access back-office apps from the field.
- Workflow management, such as setting internal service-level agreements so that employees acknowledge completion of a task.
- Business process automation functions, such as document approval from multiple parties.
- Human resources functions, such as self-service aspects of HR management systems.
- Task management apps: Can Develop a customized task management program that includes to-do lists, deadline monitoring, and team collaboration to streamline workflow.
- Data Capture App: Can Develop a program that is aimed at collecting and archiving data from diverse sources, facilitating the acquisition of insightful data for business analytics.

7. Advantages and Disadvantages of Low/ No Code
7.1 Advantages
- Immense Cost Savings.
- Hyper-Efficiency.
- Improves Productivity.
- Reduces Shadow IT.
- Improves Development Speed.
- Makes Maintenance Easier.
- Reduces the burden and requires   less efforts.
- Reduces the number of developers and requires small team.
- Ease of accessibility
- Encourages Collaboration

7.2 Disadvantages
- Limited Flexibility.
- Security and Risks.
- The complication of Business Logic.
- Less Ability to Add Custom Code.
- Lack of code ownership.
- Low level features not supported.
- Functioning of the application is little unclear in no-code development.
- Using no-code development, there are limited options to build the applications and single functions.

8. Various Low/ No Code Development Platforms
For individuals who lack the knowledge or time to code, low-code and no-code development platforms are useful resources. Even while real coding languages like PHP, Python, and Java are used to create these low-code and no-code frameworks, end users don't care about the technical details. They are instead given access to visual software development environments, which allow them to link, drag, and drop program components while observing what happens. It can be applied as a familiar wizard-style paradigm to create, test, and even implement applications that areentirely centred around user-friendliness. Some of the famous platforms are given as follows:

Sales force

San Francisco, California serves as the corporate home of the US cloud computing startup Salesforce, Inc. Offering sales, customer service, marketing automation, e-commerce, analytics, and application development-focusedsoftware and apps, it offers customer relationship management (CRM). In February 1999, Marc Benioff, aformer Oracle executive, founded Salesforce.The company expanded swiftly, and in 2004 it went public. CRM, with a market capitalization of around US$153 billion, ranks as the 61st largest corporation in the world as of September 2022.By 2022, it was the biggest enterprise software company globally. In the latest Fortune 500 list, Salesforce came in at position 136, earning a total of US$26.5 billion in 2022 (clarification needed). Salesforce is also included in the Dow Jones Industrial Average as of 2020.

App Sheet

With AppSheet, users can construct mobile, tablet, and online applications using cloud-based spreadsheet and database platforms such as Google Drive, Drop Box, Office 365, and others, all without having to write any code. Project management, customer relationship management, field inspections, and customized reporting are just a few of the many business use cases that may be implemented with this platform. January 2020 saw Google acquire AppSheet.With the AppSheet platform, cloud-based databases and spreadsheets can be converted into mobile apps. Spreadsheet platforms such as Google Sheets allow for the direct creation of apps as an add-on. The platform offers greater governance, data analytics, and performance choices for larger enterprises through corporate licensing and self-service models.AppSheet programs can record data via barcodes, NFC, geolocation, signatures, and photos.

Bubble

The Bubble Group developed Bubble, a visual programming language, a no-code development platform, and an application platform as a service that lets non-techies create web apps without having to know how to write code. Rather, by dragging and dropping components into a page and creating processes to manage the logic, users create the interface. Bubble aims to largely eliminate the need for hand-coding web apps.In 2012, Josh Haas and Emmanuel Straschnov established Bubble in New York. Bubble started from scratch seven years ago. In 2021, Bubble raised $100 million.Bubble.io revealed a contentious update to their pricing structure in April 2023, including a new unit of measurement known as "workload units."

9. CONCLUSION

For developers, IT managers, and companies, low-code and No-code development platforms are streamlining the software development process. It's critical to be able to use these technologies to develop applications locally, especially with the advent of citizen developers. The market for enterprise Low-Code No-Code platforms is expanding quickly as more and more technology companies are having trouble finding qualifieddevelopers and as more subject matter experts are retiring.Many citizen developers will choose minimal code development over other options since it eliminates the requirement for sophisticated coding knowledge. Low code issuperior to standard coding in many aspects. In certain cases, a conventional coding methodology is necessaryto guarantee the desired outcomes. pointing outthat the IT industry has given low-code/no-code a unique function. By making the process of developing apps as simple as organizing folders, entrepreneurs have been able to realize their imaginative ideas.

10. Future Scope

The software industry has had to look for alternate ways to deliver its services and products while staying up to date with technology due to the emergence of new automation technologies, the sharply increasing expectations and demands of customers and end users who are insatiably curious about new ideas, and a lack of developers. Platforms for low-code development now make it feasible to overcome this difficulty.Although an excellent starting point for creativity and innovation, this increasing reliance on enterprise and customer-focused apps is not without its difficulties. The low code/no code software development paradigm seeks to overcome these issues. With the global no-code development platform market expected to reach $52 billion by 2024 and with low-code and no-code platforms expected to be used to develop at least 65% of all business applications by 2025 and according to the surveys it is expected that the low-code development market will generate $26.9 billion by 2030. The following are the top ten reasons why low code is the way of the future:

- Flexibility
- Simple& Feature-packed
- Reduction of failure rate
- High-speed Development cycle
- Cost Reduction
- Reduction of Bugs
- Interconnection
- Multiple Deployment
- Rapid Prototyping

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