



Enabling Enterprise Agility with Low-Code/ No-Code, AI, and Platforms



Overview

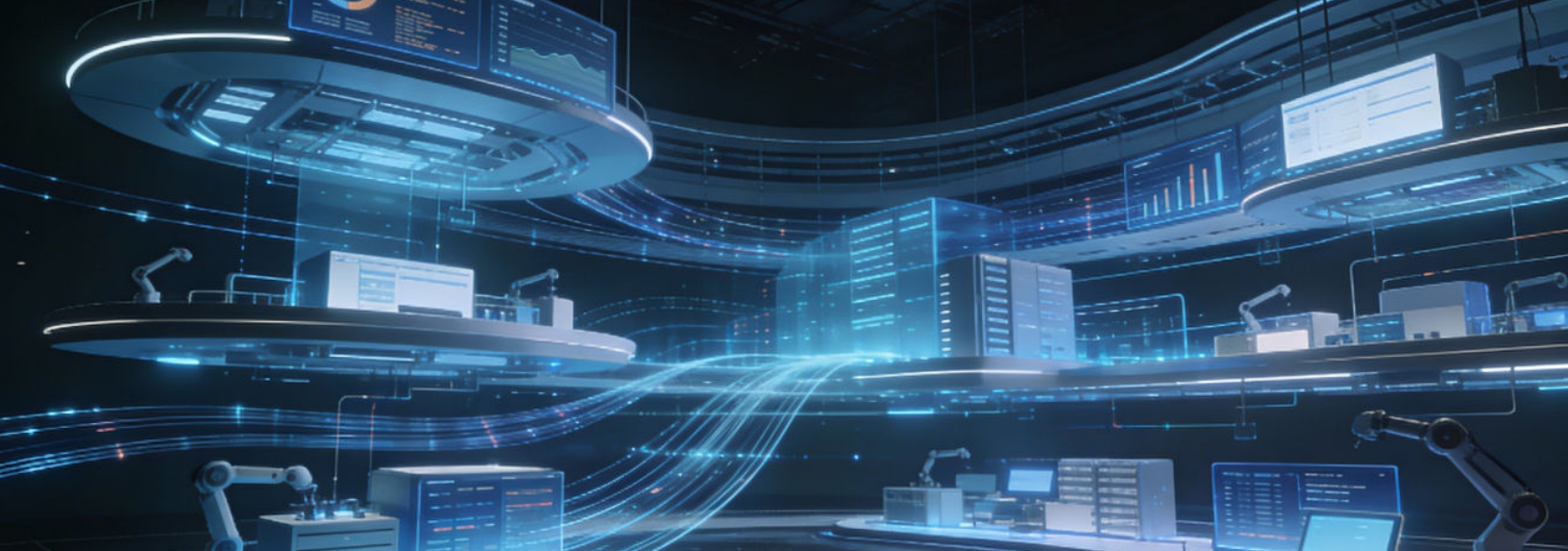
Organizations face relentless pressure to deliver digital capabilities faster while operating under skill, security, cost, and governance constraints. Traditional application development, with its long cycles and reliance on limited developer capacity, is no longer sufficient. Enterprises are rethinking who builds software, how it is built, and the platforms required for safe, scalable delivery.

This is why businesses are turning to low-code and no-code (LCNC) solutions to complement their professional development (pro-code) teams. These tools democratize application creation, putting it directly in the hands of business users, referred to as citizen developers, who are intimately familiar with the problems to be solved.

Modern development strategies no longer treat LCNC and professional engineering as separate or competing tracks. The strongest outcomes come from using both together, allowing business users to move quickly while pro-code developers ensure architectural integrity, integration, and long-term resilience.

For LCNC solutions to truly succeed at scale, they must be part of a broader strategic approach. Even if LCNC applications operate independently, they must still access corporate data, connect to enterprise systems, and meet security requirements. This requires the right people, streamlined processes, and a foundational platform aligned with governance and security objectives.

Citizen developers accelerate business outcomes, while engineering teams maintain guardrails, shared services, and durable platforms that allow solutions to scale.



The Importance of Citizen Developers

The concept of a citizen developer has undergone significant evolution. The term itself is resurging after earlier associations with “rogue” development and “shadow IT.” Now, these tools are relied upon to strategically unlock domain expertise within the business units. These individuals understand their processes and markets deeply and can build applications that directly improve workflows.



>70% of Organizations have at least 21% LCNC apps.

50%+ of new apps are built by a significant segment

Nearly Half are in the 31–50% range.

Below 21% LCNC Adoption

Source: Futurum Intelligence

The traditional development cycle could not keep up with business demands. Even with DevOps accelerating pro-code development, the need for rapid iteration persists. By empowering citizen developers, organizations shorten development cycles and reduce time-to-market. These individuals contribute to innovation without mastering complex programming or infrastructure.

AI-powered development enhances this capability through intent-based development, where natural language interfaces allow users to describe desired outcomes and have AI interpret intent, propose implementations, and generate the required logic or code, narrowing the gap between citizen-developed and professionally engineered solutions.



LCNC: Democratizing Innovation

LCNC tools are not a single solution, but a spectrum of capabilities. No-code platforms offer visual, drag-and-drop interfaces ideal for less-complex applications, workflow automation, and dashboards. Low-code platforms provide similar visual interfaces but also allow code snippets, scripts, or custom integrations to enable more advanced functionality.

Increasingly, professional and citizen developers use LCNC to build scalable applications quickly, turning ideas into working solutions in days or weeks. In practice, these applications often require professional teams to harden them for enterprise use, particularly for security, scalability, and integration into standard delivery processes.

AI-powered technologies accelerate this shift. Natural language interfaces, pretrained models, and reasoning tools allow both developers to describe objectives or policies, and the AI generates or adapts solutions. This further reinforces the complementary relationship between LCNC and traditional engineering by raising the baseline capability across all contributors.

The strategic value lies in faster problem-solving, quicker innovation cycles, and empowering business users to act without waiting on technical backlogs or resources.

LCNC Rarely Exists in a Vacuum

LCNC applications often originate within business units to address productivity, workflow, or analytics needs. As these applications mature, they typically require integration with enterprise data, systems, and security infrastructure, including secure data access, SSO, compliance, and interoperability with corporate applications.

These integration points often introduce complexity. Overcoming them requires a holistic, enterprise-aligned approach rather than isolated departmental tools. As LCNC, AI, and citizen development scale, the challenge shifts from how fast teams can build to how deliberately organizations decide where innovation can move quickly, where guardrails must apply, and which platforms are trusted to connect speed with control.



Strategic Vision for the Future of Development

IBM's approach to the LCNC market is not to simply offer a standalone tool. The vision is to empower enterprise-grade agility. While point solutions may address specific tasks, large enterprises require cohesive, governed, and secure ecosystems.

IBM addresses enterprise needs by blending LCNC capabilities with proven engineering lifecycle management (ELM) systems and tools. As low-code, AI, and citizen development scale, CIOs must shift from maximizing speed to deciding where teams can move fast, where guardrails apply, and which platforms are trusted to connect innovation with operational control.

To achieve this, IBM's LCNC strategy is built on three core pillars:

- Hybrid cloud
- Enterprise-grade governance
- A platform-powered experience.

Hybrid Cloud as a Foundational Strategy

Most large enterprises operate across on-premises, private cloud, and multiple public clouds, making hybrid cloud support a foundational requirement for any LCNC strategy.

IBM's offerings provide the infrastructure-as-code (IaC) foundation necessary for hybrid cloud deployments, ensuring that LCNC applications are portable and secure wherever they must be deployed. This combines the flexibility of public clouds with the control and security of on-premises deployments.

Enterprise-Grade Governance and Security

Unmanaged application development introduces governance and security risks. A rising volume of LCNC-created apps can create inconsistent access patterns, fragmented security boundaries, or compliance challenges.

This is why platform engineering is essential. Governance must be embedded in the platform, not left to individual developers. Embedded capabilities include identity and access management, secrets management, data access controls, observability, and auditability. This shifts organizations from a “build and hope” model to a governed-by-default approach.

A Platform-Powered Experience

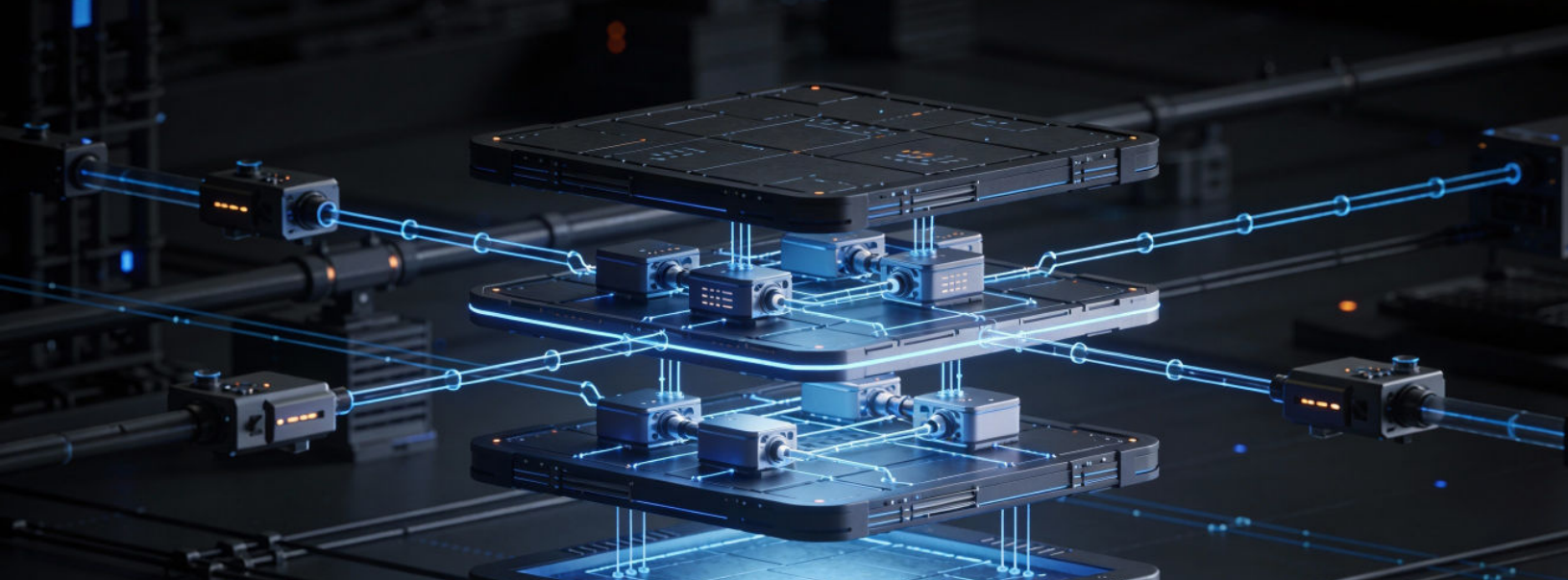
IBM's vision is to provide a unified platform that supports the full application lifecycle, from citizen creation through enterprise deployment. This avoids fragmented, unmanaged toolchains and security gaps that create business risk.

A unified platform streamlines workflows and ensures that an application's journey from idea to production is automated, traceable, and secure, while aligning with enterprise governance standards and existing technology stacks.

IBM Engineering Lifecycle Management (ELM) provides a governed backbone that connects requirements, modeling, testing, and change management across complex systems and software development. It improves collaboration across technical and nontechnical teams through end-to-end traceability and configuration management, reducing delivery risk by keeping system and software design aligned throughout the full development lifecycle.

The future of development requires balancing LCNC speed with ELM discipline so innovations can scale safely and predictably.





Platform Engineering: Ensuring Production Readiness

The true value of LCNC tools is realized only when the applications built with them can be deployed reliably and securely. This is where platform engineering becomes essential. A platform engineering team provides a self-service environment that abstracts infrastructure, security, and operational complexity.



Source: Futurum Intelligence

Platform engineering supplies enterprise-grade capabilities typically absent in isolated LCNC efforts, including:

- Infrastructure as Code (IaC): Automated provisioning and resource consistency
- Integrated security: Identity, secrets management, and compliance enforcement
- Observability: Logging, monitoring, tracing, and performance visibility
- Data integration: Standardized, secure access to corporate data without custom connectors



Strategic Synergies: Powering the LCNC Ecosystem

A successful LCNC requires a powerful, automated backend. IBM's portfolio, including HashiCorp and Red Hat, provides this foundation.

Terraform, Ansible, and Infragraph: A Foundational Partnership

The acquisition of HashiCorp brings powerful capabilities to IBM. Terraform is the industry standard for infrastructure provisioning as code, while Ansible is a leading automation tool for configuration and application deployment. Their synergy supports reliable, scalable LCNC deployments.

Terraform enables declarative, version-controlled infrastructure provisioning. Ansible orchestrates configuration and application lifecycle tasks. Together, they automate provisioning, configuration, and deployment across hybrid cloud environments.

For example, a citizen developer can build an application using LCNC tools, and the platform, via Terraform and Ansible, can automatically:

- Provision the cloud environment
- Configure data or application services
- Deploy the application at scale.

This automation is essential for modern enterprises.

Infragraph extends this foundation with a graph-based model of infrastructure resources, dependencies, configurations, and relationships, providing contextual understanding of a dynamic operating environment.

With this added understanding, the current generation and new AI systems can make informed recommendations and automate multi-step workflows with confidence, further enhancing the reliability and scalability of LCNC applications.

IBM's unified platform reduces vendor sprawl and operational complexity. Automated workflows and integrated DevOps pipelines ensure LCNC applications progress from creation to production without disruption. Application delivery becomes automated end-to-end, from initial assembly through testing, deployment, and ongoing operations, ensuring that development speed is matched by production readiness.

AI Is the New LCNC

The LCNC space is rapidly evolving as AI-powered development tools reshape how applications are built and managed.

AI is transforming LCNC platforms into AI-powered systems and agents capable of generating code, managing workflows, and automatically testing applications. Instead of manually connecting components, users can describe their intent in natural language, and AI completes the underlying technical work.

AI Integrated Development Environment tools, such as IBM Project Bob, extend these capabilities for both pro-code and citizen developers. Project Bob allows developers to analyze codebases, generate tests, optimize architecture, and assemble components through natural language prompts. This makes AI an accelerator across all development roles.

This shift from abstraction to intent-based development makes software creation more accessible. Non-technical users can build sophisticated applications, and pro-code developers can focus on higher-level design and system integrity.

Natural Language and AI Agents

LCNC platforms will increasingly adopt natural language and AI agents as the primary means by which users interact with the system.

Agents extend LCNC by providing a new development surface for both pro-code and citizen developers. Instead of building workflows step-by-step, developers define goals and delegate execution to autonomous agents.

Solutions such as IBM watsonx Orchestrate enable users to describe outcomes in plain language, and the agent assembles the required logic and integrations. For example, a developer might specify a desired outcome in natural language, such as handling a new order, and the agent reasons through the workflow and automates multi-step execution across applications and data sources.

Composite AI

These advancements reflect a broader movement toward composite AI, where multiple forms of AI reasoning, generation, retrieval, and prediction operate together. Composite AI enables:

- More accurate automation
- Context-aware decision-making
- Smarter workflow generation
- Unified collaboration among developers, business users, and agents.

This elevates enterprise capability by making advanced development tools accessible across roles and enabling a "development by all" model of software creation that includes citizen developers, professional engineers, and intelligent agents.



Conclusion

LCNC tools span a spectrum of capabilities, from fully visual no-code platforms to low-code environments that allow extensibility through scripts, integrations, and custom logic, enabling both simple workflows and more advanced applications.

IBM's platform approach supports the entire application lifecycle and ensures that the speed of LCNC creation translates into production-grade value. With technologies such as Ansible, Terraform, Infragraph, and AI-powered development tools, IBM provides an automated hybrid cloud foundation with strong governance and reliability across the LCNC ecosystem.

AI-powered development must operate across the entire lifecycle, not only the initial creation. The real value appears when AI-powered, LCNC-built solutions integrate with deployment, operations, and ongoing management. By aligning platforms such as Ansible for configuration and Terraform for infrastructure provisioning, organizations create a unified and automated digital thread that connects initial intent to production outcomes. This ensures that rapid changes created by developers or AI agents are tested, governed, and deployed with precision.

As LCNC, AI IDEs, agents, orchestration, and knowledge graphs continue to evolve together, enterprises gain a more flexible and holistic development ecosystem. This strengthens pro-code and citizen creators, and enables faster innovation without sacrificing governance, security, or operational rigor, enabling the "development by all" model of software creation.

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IBM is a global technology leader that helps organizations modernize operations and accelerate innovation through hybrid cloud, AI, and automation. Its portfolio combines enterprise-grade platforms with low-code and no-code developer tools that enable both professional developers and business users to build, integrate, and automate applications faster. By reducing reliance on custom code, IBM helps teams streamline workflows, improve productivity, and respond more quickly to changing business needs. These capabilities are designed to work seamlessly across complex enterprise environments, balancing speed of development with security, governance, and scalability.



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