

A Practitioner's View: Agile Transformation of the Modern Enterprise with the Advent of LCAP/NCAP Solutions

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## **Executive Summary**

By 2024, three-quarters of large enterprises will be using at least four lowcode development tools for both IT application development and citizen development initiatives. Low-code application development will also be responsible for more that 65% of application development activity."

~ Gartner Research, September 2020

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In September 2020, Gartner Research predicted that by 2024, three-quarters of large enterprises would be using at least four low-code development tools for both IT application development and citizen development initiatives.<sup>1</sup> This was pre-pandemic. With an increasing need for agile digital transformation and market realities, LCAP/NCAP solutions could become a game-changer for modern enterprises.

This whitepaper presents a synopsis of LCAP/NCAP technologies and solutions, alongside their successes and challenges. It critically reviews various stages at which businesses can deploy LCAP/NCAP solutions for success. It also outlines an adoption approach of these solutions within different types of enterprise transformation scenarios ranging from legacy systems to digital natives and those in between.

1. Vincent, P. et al. Magic Quadrant for Enterprise Low-Code Application Platforms, Gartner, September 30, 2020.

## Introduction to NCAP and LCAP

Gartner defines LCAP as an application platform that supports rapid application development, one-step deployment, execution, and management using declarative, high-level programming abstractions such as model-driven and metadata-based programming languages.<sup>2</sup>

Application platforms provide runtime environments for application logic. They manage the lifecycle of an application or application component and typically ensure the availability, scalability, security, and application logic monitoring. Some examples of traditional application platforms are the Microsoft.NET platform (for web and desktop) and Java platforms (running on web servers like Apache). These platforms enable developers to grow their business applications quickly.

A low-code application platform (LCAP) is a recent innovation that supports the development of user interfaces, business logic, and data services and improves productivity. The main difference from traditional application platforms is they enable the creation of business applications with minimal code. They do this at the expense of portability across vendors. The other key difference is that LCAP platforms are cloud-native and delivered as SaaS (Software-as-a-Service).

An enterprise LCAP supports enterprise-class applications. These require high performance, scalability, high availability, disaster recovery, security, SLAs, resource-use tracking, technical support from the provider, and API access to and from local and cloud services.

A variant of LCAP is the NCAP (No-Code Application Platform), implying that the platform requires text entry only for formulas or simple expressions. Users can enable all other aspects of app development by configuration or visual modeling.

A Forrester survey of global developers revealed that 23% were using lowcode platforms in 2018 and another 22% planned to do so within a year. Digital businesses' demand for ever more software ever more quickly is the big driver of adoption.

2. Vincent, P. et al. Magic Quadrant for Enterprise Low-Code Application Platforms, Gartner, September 30, 2020.

Most low-code development platforms have a user-friendly graphical interface instead of integrated development environments, which offer greater functionality through traditional computer programming tools. Unlike no-code development platforms that provide a drag and drop experience, low-code development platforms let users create and alter source code if necessary.

Companies see LCAP- and NCAP-based solutions as very promising innovations that can help application development proceed faster. With the development and release cycles continually shrinking and software development methodology moving relentlessly to agile-based development and deployment, these new solutions become a key driver to ensure streamlined software development.

This graphic illustrates the space in which LCAP- and NCAP- based solutions operate.



Figure 1: Cloud Service models and where LCAP and NCAP solutions play

## NCAP and LCAP Solution Landscape

The versatility in low-code development platforms allows for many use cases. Teams of experienced developers benefit from the coding functionality in low-code platforms, while businesses that need to make an application quickly but have no coding experience benefit from never having to touch the source code. This flexibility allows more people to contribute to a project.

Both developers and non-developers use these tools to practice rapid application development with customized workflows and expanded functionality.

### Key Benefits of Low-Code Development Platforms

- Increased collaboration across departments and third parties
- Rapid development due to accessible nature of low-code platforms
- No coding experience necessary
- Versatility and flexibility in use cases

There are many solutions in the marketplace today that advertise themselves as No-Code and Low-Code Development platforms. We will take three synopses from leading market comparisons to bring out a comprehensive solution landscape. Gartner's Magic Quadrant for Enterprise LCAP, released in August 2019, covers all three segments (low-code, no-code, and citizen development solutions) and gives a good description of the market.



Figure 2 at left: Gartner Magic Quadrant for Enterprise LCAP (published Aug 2019)<sup>3</sup>

- Leaders have significant enterprise coverage for a subset of SaaS service extensions, app modernization or development, or citizen development.
- Leaders may not always be the best choice for a specific enterprise application. A smaller, focused vendor may be more appropriate for a specific geography or industry or certain capability or functions.

3. Vincent, P. et al. Magic Quadrant for Enterprise Low-Code Application Platforms, Gartner, September 30, 2020.



Figure 3 at left: Forrester Wave for Low-Code Development Platforms for AD&D Professionals (published March 2019)<sup>4</sup>

- 13 significant suppliers studied. Microsoft, OutSystems, Mendix, Kony, And Salesforce are leaders. Features for digital business use cases typically set apart the leaders.
- Web/mobile support, integration standards, data management and mapping, workflow, dev support, and IDAM are table stakes.
- Leading vendors have moved into Business Process Automation, real-time apps and Al services, as well as large mission-critical systems.

The Forrester Wave report, released in Q1 2018, covers the vendors against market presence and strength of offering. Figure 3 shows the Forrester Wave rankers. The G2 Grid from g2.com covers the vendors against market presence and customer satisfaction (depicted below).



Figure 4: G2 Grid for LCAP

- G2 scores products and vendors based on reviews gathered from the user community, as well as data aggregated from online sources and social networks.
- OutSystems, with a score of 4.6/5, is the leader. Salesforce, Springboot, KissFlow, and Pega are also in the top right quadrant.
- To qualify for inclusion in the Low-Code Development Platforms category, a product must: Generate source code as a base for customization; allow developers to customize HTML markup and source code as a primary function; and integrate with databases, web services, or APIs to connect data.

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4. Rymer, J. et al. The Forrester Wave™: Low-Code Development Platforms For AD&D Professionals, *Forrester*, March 13, 2019.

These three synopses were the basis for a deeper dive into the leading vendors providing LCAP/NCAP solutions, considering their key features, strengths, and applicability to various use cases and projects, summarized below:

Table 1:		Global <b>Logic</b>
PRODUCT/VENDOR	KEY FEATURES & STRENGTHS	APPLICABLE FOR
OutSystems outsystems	<ul> <li>.NET Based RAD environment</li> <li>Advanced Web/Mobile UX</li> <li>B2C support</li> <li>Batch Processing support</li> <li>Azure &amp; AWS Deployment</li> </ul>	<ul> <li>Enterprise App Dev primarily for BPM automation</li> <li>Professional Developers</li> </ul>
Appian Appian	<ul> <li>Model-driven Intelligent BMP (iBPM)</li> <li>Complex business rules, decisioning, and workflow</li> <li>Chatbot support</li> <li>PWA support</li> </ul>	<ul> <li>Enterprise App Dev primarily for BPM automation</li> <li>Govt. use cases</li> </ul>
Pega Systems PEGA	<ul> <li>Event Processing, Decision Management, Data Science, Integration</li> <li>Multi-persona UX Design systems</li> <li>Stand-alone business application components (CRM, Finance, Healthcare, Govt.)</li> </ul>	BPM Automation (including RPA)     Consulting-led SI
mx	<ul> <li>Integrated with Siemens MindSphere IoT and PLM</li> <li>On-prem, Multi-cloud, and Multi-tenant deployment options</li> <li>Auto-scaling, high-availability and very low latency for failover</li> </ul>	<ul> <li>Enterprise App-Dev</li> <li>IoT based use cases (Industrial etc.)</li> </ul>
Microsoft Power Apps	<ul> <li>Unified LCAP comprising Dynamics365, PowerApps, Flow, and CDS</li> <li>Power Platform includes 240+ 3rd party web service and data source connectors</li> <li>Enterprise-grade features such as server-side logic, business process, advanced security, and developer support</li> <li>Drag-and-drop design</li> </ul>	<ul> <li>Good mix of citizen development and complex app dev</li> <li>B2B use case,s especially for ISVs</li> </ul>
SalesForce Lightning	<ul> <li>Best in class features with AI libraries for discovery, prediction and voice (SF Einstein), DevOps integration (SF DX) and Event-driven design</li> <li>5000+ 3rd party applications on SF AppExchange</li> <li>Mostly on its own data centers, recently moving to AWS</li> </ul>	<ul> <li>Enterprise app-dev (mostly non-BPM)</li> <li>Professional developers</li> </ul>
Zoho Creator	<ul> <li>Built-in integration PaaS (iPaaS)</li> <li>Access to SaaS services like chatbots and analytics</li> <li>Predefined data schema, conversational and headless voice apps, PWAs</li> <li>Zia integration (Al-driven NLP)</li> </ul>	<ul> <li>SMB app-dev (CRM and more)</li> <li>Professional and citizen development</li> </ul>
KissFlow	<ul> <li>Unified Digital Workplace Platform</li> <li>Cloud-first</li> <li>Focused on BPM</li> <li>Administration tools for optimal management of business processes</li> </ul>	<ul> <li>BPM Automation for all industries</li> <li>Professional and citizen development</li> </ul>

## Challenges in Modern Enterprise AD&D

Gartner predicts that market demand for app development will grow at least five times faster than IT's capacity to deliver it through 2021 and that one out of every three new B2E mobile apps will fail within six months of launch by 2019.<sup>5</sup>

Modern enterprise AD&D (application developmen and delivery) is a complex activity. Unlike consumer or B2C software development, the challenges are very different. In addition to endcustomer requirements, user experience and functionality, enterprise application development teams need to have an equivalent focus on aspects like

- High availability and disaster recovery.
- Strong support for dashboards and reports.
- Secure access to application services (e.g., authentication, authorization, and encryption).
- Ease of integration with other enterprise applications and systems.
- Technical support to customers.
- Code maintenance.
- Third-party application access to application logic and/or data via APIs and/or event topics.

#### Table 2:

Global**Logic** 

Key Challenge		Attributes and Implications
1	The need for quick adaptation	<ul> <li>Agile and quick response to changing business requirements</li> <li>Customization at all levels</li> </ul>
2	Ever increasing security requirements	<ul> <li>Ensuring information security and protecting business-critical resources</li> <li>Data encryption (at rest, in motion)</li> <li>Authentication and authorization</li> <li>High-quality security testing</li> </ul>
3	Processing and storage of large amounts of data	<ul> <li>Ease of access, availability, and security</li> <li>Cloud solutions versus own infrastructure</li> </ul>
4	Integration with other systems	<ul> <li>Current coupling or dependency of existing enterprise systems (monolithic, web-based, cloud-based)</li> <li>Factors insufficient testing for both initial</li> <li>integration and future patches and updates</li> </ul>
5	Quality post- release support	<ul> <li>Maintenance of the production system</li> <li>Toolchain to support quick triage, workarounds, and fixes/updates</li> <li>SLAs for issues</li> </ul>

We have identified the **top 5 challenges in Enterprise Application development and delivery** and their key attributes and implications in the table above (at right).

4. Ismail, Nick. The state of application development, Information Age, accessed January 19, 2021.

If we peel the onion a layer further, some of the critical capabilities that the development team needs to bring together in successful Enterprise AD&D are listed in the table below.

Table 3: GlobalLogic				
Critical Capability		What this means		
1	Back-end Data, Logic, and Process	How does the application architecture and system support shared data and associated business logic and processes? How are CRUD operations managed? Are there multiple data stores? How many of these processes are automated or can be automated?		
2	Cloud Functionality	Is the application developed and/or deployed on cloud infrastructure? What is the nature of the cloud (public, private, and hybrid)?		
3	Enterprise Worthiness	Does the application support aspects like governance, access/roles, data security, regulatory compliance and standards?		
4	Integration capabilities	Does the application support back-end integration to local and/or cloud services via data sharing models and APIs?		
5	Advanced Architecture support	How does the application support non-data concepts? For example, event brokers, cloud-native use cases, etc.		
6	End-user experience	How does the application-rich mobile and web interfaces affect progressive as well as continuous user experience?		
7	Enterprise IT SDLC support	How does the application work across different software development life cycle (SDLC) management and tooling? Does the application have a mix of components/systems that operate on different service paradigms?		
8	UX Data, Logic, and Process	How do the application architecture and system support user experience through local data, business logic for tasks like data validation, and processes like page navigation?		

Businesses need to consider all of the above challenges and critical capabilities of a complex enterprise application when looking at LCAP and NCAP platforms as a potential solution or accelerator.

## Application of NCAP/LCAP in the Enterprise

Gartner's analysis on LCAP application (Q4 2019) revealed that while LCAP often targets citizen developers, in reality, they are more likely to be used by professional enterprise IT developers (66% of respondents of a 200+ person survey).

Accelerating digital transformation and losing ground to competitors are ranked as top worries for IT executives. Scaling innovation is one of the perennial 'how-to' problems seen as a key way to meet those worries. Since low-code development tools solve many of the headaches associated with getting software deployed quickly and scaled across multiple business lines, companies see them as a change-maker and a panacea.

For example, LCAPs are a great way to rapidly build and deploy proof-of-concept prototypes that a business controls within the bounds that IT sets. This ability to get a clear picture of what is working from these developed prototypes means that the design of the final software can be tweaked, deployed, and then scaled quickly. These rapid-design iterations enable organizational agility on a whole new level, resulting in dramatic cost savings in IT projects.

Application of LCAP and NCAP platforms in the enterprise can be classified into a few use cases as follows:

### Citizen Development

This is a use case where a citizen developer (anyone in the business who oversees a team or automates processes) creates the needed application.

The citizen developer is not a software developer but has a good understanding of the line-of-business, the process workflows, and the inputs/outputs. Traditional roles of a citizen developer are BA (Business Analyst), Marketing Analyst, etc. LCAP and NCAP platforms help these developers jumpstart the application development via UI visual interfaces, easy workflow configuration/creation, hooking up connectors for data integration, etc. Citizen development outcomes usually deploy quicker because the individual(s) creating the app are closer to and intimately understand the processes that need automating and building.

### Business Unit IT Application Development

This is a use case that targets both B2B (Business-to-Business) and B2E (Business-to-Enterprise) scenarios. This use case involves building and deploying new enterprise applications involving web, mobile, data, business logic, and external services within 3-5 months.

LCAP and NCAP platforms are typically useful for traditional departmental and LOB (Line of Business) applications since deep application development skills are not needed here. The application use cases normally follow a reuse pattern, which would likely be off-the-shelf functionalities of the LCAP/NCAP platform.

### Enterprise IT Composite App Development

This is a use case that targets B2B, B2E, and B2C (Business-to-Consumer) scenarios. This use case involves replacing automated business processes supporting multiple data sources, external services, and end-user roles where process change occurs regularly and high scalability is required.

Projects like legacy modernization and application rationalization are suitable examples of this use case. LCAP and NCAP platforms are evaluated here for a long-term investment horizon by looking at the benefits of reducing internally built high-control applications and having a future-proof and scalable technology solution.

### SaaS and ISV Mobile and Web Application Development

This is a use case that targets B2B and B2C scenarios. This use case involves creating applications involving rich user experience on web and mobile and includes functionalities such as end-user management, billing, etc.

The USP of LCAP and NCAP platforms in this segment offers productivity and time-to-market. Their evaluation typically hinges on the user experience capabilities and flexibilities.

## Conclusions and Call to Action

The journey of a thousand miles begins with a single step. - Lao Tzu

It is clear that Low-Code and No-Code platforms are here to stay. They are becoming pivotal in the surge to make enterprises more digital and agile.

LCAP and NCAP platforms have been prevalent in the business process workflow (BPM) space for a long time and gained a good amount of maturity.

They are increasingly covering all other spaces in the enterprise – be it real-time applications, experience UI-based B2C and B2B solutions, or back-end solutions involving AI and Machine Learning insights.

As you look at your own industry, domain, and enterprise map while evaluating this trend, it may be beneficial to utilize the following 10-point cheat sheet at right for considering the right LCAP or NCAP platform.

#### Table 4:

#### Global**Logic**

#### Does it empower your operations?

- 1. Can the line of business owners develop low-code apps that work directly with their processes?
- 2. Does the solution work with your industry and specific field use cases?
- 3. Can it reliably capture and send data to people and system of record/execution?
- 4. Is the solution capable of scaling rapidly across lines of businesses?

#### Does it empower your field workers?

- 5. Does the solution work across all mobile devices with a simple, fieldwork-friendly interface?
- 6. Can the solution streamline fieldworkers' workflows with local data, business logic for tasks like data validation, and processes like page navigation?
- 7. Are field teams put first in design and solution execution?

#### Does it empower your existing tech stack?

- 8. Are integrations with back-end, local, and cloud services via APIs and data sharing built into the solution?
- 9. Can the LCAP or NCAP connect app-to-app with applications your field workers may already be using, including FSM, EAM, APM, fleet, and CRM systems?
- 10. Does the solution prioritize governance, access and data security, and regulatory compliance standards?

### About the Author



Nitin Unni is Director of Engineering and a domain enterprise architect at GlobalLogic. He has been involved in large digital transformations throughout his career and has engaged in various ROI analyses, technology evaluations, and solution blueprinting for enterprise customers.

In his charter at GlobalLogic, he is responsible for recommending best-of-breed solutions, software, and toolchains for Greenfield projects and bringing agile and digital maturity in complex AD&D programs.

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