Techstrong Research

DATA CONNECTIVITY AND **LOW-CODE/NO CODE**

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EXECUTIVE SUMMARY

SOFTWARE ENABLES BUSINESS. Everyone wants an application to accelerate business operations. The demand for custom software programs has put pressure on IT leaders to improve application delivery speed while reducing costs. This environment has fostered the creation of AI-enabled tools that leverage API catalogs, prebuilt templates and automation to allow non-programmers to become software "assemblers." Creating a library of custom applications, that doesn't involve using programmers, is the goal of Low-code/No-code development tools. These programming assistance capabilities are provided as Platform-as-a-Service. Using drag-and-drop tools allow 'citizen developers' to easily design, build and launch applications.

Usage of Low-code/No-code development platforms has grown in popularity. Some analysts predict the majority of applications will be built using these methods over the next few years. Accelerated Strategies Group set out to gain greater insight on the status of these development tools within organizations. Specifically, the research looked into how well Low-code/No-code performed at integrating with data sources and its success at creating software 'assemblers.' The research involved surveying individuals familiar with their organization's Low-Code/No-Code activities. The survey was conducted between March and April 2021, with a total of 389 responses. The worldwide survey covered companies of all sizes. There is a wide range of activity in the usage of Low-code/No-code development. Around 25% of small companies and 20% of larger companies have a primary strategy to create applications using this method. A nearly equal number of companies are either creating a subset of applications or running pilots with these platforms. However, over 25% of companies are not using the development capabilities offered by this emerging technology.

The essence of Low-code/No-code software development is that 'almost anyone can assemble' software. The assembler can create new software capabilities to help them perform specific business tasks. Employees involved in Low-code/No-code development come from a wide range of organizational units. Interestingly, in nearly half of the organizations surveyed, a member of the IT department was an active Low-code/No-code user. There are many opportunities available for people to develop applications in a Low-code/No-code environment. The most often used are those available from Microsoft, Salesforce and ServiceNow. Although most applications are created using a cloud environment, a third of those applications exist locally.

Businesses enabling applications need to connect to a wide range of important data to provide value. The need to link to back-end systems, databases, web services, or APIs does not change with Low-code/No-code applications. It is possibly more important since the applications are designed to improve business productivity. Nearly 3 out of 4 (74%) of the Low-code/No-code applications developed by the surveyed organizations require access to information external to the applications. Those external data sources are most often cloud-based storage (e.g. Amazon S3) or cloud and local databases (e.g. SQL Server, Oracle, MySQL and DB2). Over half of the applications access data made available using custom API integration and located in cloud-based SaaS applications such as Salesforce, ServiceNow, Hubspot and Dynamics 365.



The ability of Low-code/No-code applications to access data is a key function. This is generally accomplished with automated links to data sources. The survey data implies there needs to be improvements when it comes to data connections, only 20% of the time are needs fully being met. Connectivity is inadequate 12% of the time. In the vast majority of cases some needs are met, or can only be met with the use of additional tools.

When information needs to be synchronized or replicated with external data sources, 65% state this capability is required. This is 10% fewer than need to access external data sources. The most popular data synchronization element are other applications, with databases a close second. Similar to the connectivity issue, data synchronization and replication could be better.

Applications created to improve business operations or workflows need to access external data. Organizations must also be able to synchronize or replicate that data to external sources. Not being able to interface with required data reduces application effectiveness. In most cases, data connectivity and synchronization of external data is not meeting all of the needs of the enterprise. This position was reinforced as over 70% of the survey responses stated that the ability to access external data is a limiting factor in utilizing Low-code/No-code development. Organizations want data access from Low-code/No-code applications to meet all of their needs, without that, the utility of having Low-code/No-code development operations is reduced.

The objective in using Low-code/No-code development is to allow nonprogrammers to create business workflow applications. Low-code solutions generally target users with some development experience while No-code offerings remove the need for the user to write any code. Only a minority of the people using the tools have no technical knowledge. More of the non-technical users work for small companies. People who are considered business-oriented make up over 60% of the individuals using Low-code/No-code development tools.

The research finds that the goal of enabling the 'citizen developer' is not being met. Staff require a certain level of knowledge. Only 30% stated that the existing skills of the staff provide no limitations, or are a minor inconvenience, when it comes to the ability to use Low-code/No-code development.

Overall, this research points out that the majority of companies involved in Lowcode/No-code development efforts have run into some difficulty. Areas that need improvement are data access, connectivity and synchronization. Drag-and-drop platforms can handle basic application interfaces with database connectivity, but many cannot handle complex connectivity with some SaaS applications. Out-ofthe-box connectors are great when they exist, but when they don't, links need to be manually created. Organizations need to ensure that the Low-code/No-code solution they select can handle a high number of data sources.

The survey also pointed out companies cannot just provide tools to nonprogrammers and expect them to build applications. Training is needed, not just on how to use the tools, but on understanding the intrinsic components of applications, data flow and how it will interface with other programs.

Like all projects, the utilization of Low-code/No-code requires a strategic look at the technology, how it will be used, and a deployment plan is required.



LOW-CODE/NO-CODE APP DEVELOPMENT

The development of an extensive library of custom applications without using programmers is the goal of Low-code/No-code application development tools. Low-code/No-code application development Platforms-as-a-Service activities allow 'citizen developers' to easily design, build and launch applications.

Usage of Low-code/No-code development platforms is growing in popularity. This survey is designed to allow us greater insight on the status of these development tools within the organization.

There is a wide range of activity. Between 1 in 4 small companies and 1 in 5 large companies have a primary strategy to create applications using this method. A nearly equal number of companies are either creating a subset of applications or are running pilots with these platforms. A number of companies have not begun to use the development capabilities this emerging technology offers.

LOW-CODE/NO-CODE DEVELOPMENT STATUS WITHIN ORGANIZATIONS



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LOW-CODE/NO CODE USAGE: THE WHO

The essence of Low-code/No-code software development is that nearly anyone can "assemble" software. The assembler can create new software capabilities that can help them perform specific business tasks. Employees involved in Low-code/No-code development come from a wide range of organizational units. Interestingly, in nearly half of the organizations surveyed, members of the IT department were active Low-code/No-code users.







LOW-CODE/NO-CODE TECHNOLOGIES USED TO CREATE APPLICATIONS





LOW-CODE/NO CODE USAGE: THE WHERE

Although most development is done using a cloud environment, a third of applications are developed locally.



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ACCESS TO EXTERNAL DATA SOURCES BY LOW-CODE/NO-CODE APPLICATIONS

Business enabling applications need to connect to a wide range of important data to provide value. This need to link to back-end systems, databases, web services, or APIs does not change with Low-code/No-code applications. It possibly is more important since the applications are designed to improve business productivity. Nearly 3 out of 4 of the Low-code/No-code applications developed by the surveyed organizations require access to read and write information external to the applications. Those external data sources are most often cloud-based storage (e.g. Amazon S3) or a local database (e.g. SQL Server, Oracle, MySQL, DB2 and Cassandra). Over half of the applications access data made available using custom API integrations that are located in cloud-based SaaS applications such as Salesforce, ServiceNow, Hubspot and Dynamics 365.

ACCESS TO EXTERNAL DATA REQUIRED



LOCATIONS DATA SOURCES FOR APPLICATIONS SUPPORTING BUSINESS NEEDS







LOW-CODE/NO-CODE APPLICATION DEVELOPMENT STATUS

CONNECTIVITY AND DATA ACCESS COULD BE BETTER

The ability of Low-code/No-code bult applications to access data is a key component. The business applications are created for the explicit purpose of connecting business users with important data sets. This is generally accomplished with automated links to data sources.

The question is are the Low-code/No-code tools and platforms successful in this effort? The survey data implies there needs to be improvements. Only 20% of the time are needs fully being met. 12% of the time the connectivity is inadequate. In the vast majority of cases only some needs are met or additional tools are required.

Interestingly when the data was cut by company size there was not enough variance between the categories to make it significant. PERCEPTION ON SUCCESS IN CONNECTING WITH EXTERNAL DATA SOURCES

29 6%



30%





SYNCHRONIZING AND REPLICATING EXTERNAL DATA

There are two halves to the data access story. The first is about the need to connect to data. The second part is not just being able to read and write data, but to have the capability to synchronize or replicate data. Interestingly, about 10% fewer organizations need to synchronize the data as compared to those who need to access external data sources. Given that many Low-code/No-code developments are intended to improve business workflows using mobile applications and microservices, it's no surprise that synchronization and replication with other applications is most prominent. Synchronization with databases is a close second. Connections to data warehouses is only required in a third of the cases. Similar to the connectivity issue, data synchronization and replication needs improvement.

IS SYNCHRONIZING OR REPLICATING OF EXTERNAL DATA REQUIRED?

TECHNOLOGIES LOW-CODE/NO-CODE Applications synchronize and Replicate data between



HOW WELL ARE DATA Synchronization and Replication Needs Met?







LACK OF DATA ACCESS LIMITS THE UTILITY OF LOW-CODE/NO CODE

In most cases, applications created to improve business operations or workflows need to access external data. Organizations must also be able to synchronize or replicate that data to external sources. The information can come from another application, a database, or a cloud repository. Not being able to interface with required data reduces application effectiveness. In most cases data connectivity and synchronization of external data is not meeting all of the needs of the enterprise. This position was reinforced as over 70% of the survey responses stated that the ability to access data externally is a limiting factor in utilizing Low-code/No-code development. Organizations want Low-code/No-code built applications to connect with the data required to add value to the organization. Reduced data access reduces the utility of having Low-code/No-code development operations.

IMPACT ON ABILITY TO Access External Data







SKILLS NEEDED: BUSINESS STAFF AS CODE **APPLICATION DEVELOPERS**

The objective of Low-code/No-code development is to allow non-programmers to create business workflow applications that will make their jobs better. By using drag-and-drop interfaces, supported by knowledge systems, non-programmers can develop business workflow applications. In this way, users can craft programs that handle specific data inquiries and workflows. Low-code solutions generally target users with some development experience, while No-code offerings remove the need for the user to write any code. Only a small minority of the people using the tools have no technical knowledge. More of the non-technical users work for small companies. People who are considered business-oriented workers make up more than 60% of the individuals using Low-code/Nocode development tools.

INDIVIDUAL USERS TECHNICAL LEVELS

Primarily, business skills or knowledge (non-technical)

Business skills or knowledge with some technical abilities

About an equivalent amount of both business and technical skills

Technical skills with some business skills or knowledge

Primarily, technical skills with little business skills or knowledge



OF EMPLOYEES < 500 501-9.999 10.0000+













SKILL LEVELS ASSOCIATED WITH LOW-CODE/NO-CODE NEED IMPROVEMENT

Making it easy for a "citizen developer" to create a program is the purpose of Lowcode/No-code development platforms. That is the goal, but the data says some level of knowledge is required. Operating these simple development tools does not mean you can throw people into the deep end of the pool and expect them to swim, or in this case, code. Many of the workers asked to develop applications are business people with limited technical knowledge. The Low-code/No-code tools can build applications, but business-oriented users still need to be educated on the basics on the components intrinsic to applications.

Even technical staff need some additional training. At least a third of the users identified as being technical yet 90% of the survey responses said that the lack of skill limits program utility.



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THE ACCELERATED STRATEGIES GROUP VIEW

COMPANIES AND ORGANIZATIONS of all sizes are evaluating using Low-code/No-code. Our survey showed that nearly three out of four entities are using or experimenting with the technology. Investigating the technology is precipitated on the need to improve productivity, allow business users to create applications based on immediate need, reduce development costs, and address the shortage of programmers. There is considerable information on why companies are moving in this direction, but some topics have not received proper attention.

Accelerated Strategies decided to investigate how people are specifically using Lowcode/No-code application development. One issue researched was how well Lowcode/No-code developed application interfaces with data sources. The other key area of research was whether people have the skills to effectively create applications even when the technology is designed for non-programmers.

DATA CONNECTIVITY AND SYNCHRONIZATION

Applications can do a great deal, but to be truly effective they rely on information. The need to link to back-end systems, databases, web services, or APIs does not change with Low-code/No-code applications. This statement was proven true as 73% of the respondents stated their applications require access to externally sourced data. Further, 65% responded that in addition to access, the synchronization or replication of data is required. Data connectivity and synchronization is important, but it is only half the story. The deeper question is how successful data integration is accomplished when using Low-code/No-code development. The results show it could be better. In response to multiple questions associated with data issues, a strong majority of the respondents reported that the ability to access and process external data is a limiting factor when using Low-code/No-code development processes. Only 12% of respondents said the ability to access external data was not a limiting factor, and a slightly higher 20% said the applications developed were very successful in their ability to connect with, synchronize and replicate with external data. More people said the facility is insufficient or additional tools are required.

SKILLS

Allowing 'citizen developers' to create applications is why organizations are experimenting with Low-code/No-code development platforms. People at all job functions, from non-technical business staff to fully technical employees, are engaged in simple application creation. Low-code/No-code tools are designed to make development easy, so it was surprising to discover that a lack of knowledge or skill is a limiting factor in the ability to use the platforms. No amount of automation totally eliminates the need to understand how an application functions. Even using drag-and-drop integration development tools does not mean you can throw people into the deep end of the pool and expect them to swim, or in this case, code. The Low-code/No-code tools create application code but you still need to understand the intrinsic components of applications, data flow, and how it will interface with other programs.





IT TAKES WORK

Low-code/No-code development might be disrupting application development, but companies should not expect that everyone will be able to successfully develop reliable applications with the proverbial push of a button. No amount of abstraction completely removes the need for developers, be they experienced or novices, to understand the basics of proper application techniques. The developer also must have a good understanding of how programming functions. Organizations should provide basic training on how to design (as opposed to build) applications.

The greatest impediment to successful Low-code/No-code application creation is associated with data access. Just as the 'software assembler' needs to understand program design, they also need to have an understanding on what data their applications require and where that data resides. Drag-and-drop platforms can handle basic application interfaces for database connectivity, but many cannot handle complex interfaces with some SaaS applications. Out-of-the-box connectors to data sources are great when they exist, but when they don't links need to be manually created. Organizations need to ensure that the Low-code/No-code solution they select can handle a high number of data sources. As the survey stated, at times additional tools are required.

Based on the research, Accelerated Strategies believes before companies deeply commit to Low-code/No-code development, they need to ensure that the applications they develop are able to access and manipulate critical business information. One storyline promoted regarding Low-Code/No-Code is that the 'citizen developer' can create applications with minimum to no coding training. However, the survey results point out that training and support for software developers is still required. Like all projects, the utilization of Low-code/No-code requires a strategic look at the technology, how it will be used, and a deployment plan is required.



SURVEY DEMOGRAPHICS

Accelerated Strategies Group conducted research into the growth in Low-Code/No-Code software development and the ability of those developed applications to access external data sources. The survey was conducted during March and April 2021. A total of 389 responses from individuals familiar with their organization's Low-Code/No-Code activities completed this survey.





Survey responses came from across the globe. Regional breakdown of respondents were **North America (41%), India (25%), EMEA (19%)** and **Asia (8%).**

Respondents come from a broad range of organizational sizes:







ABOUT THE AUTHOR



CHARLES J. KOLODGY is a security strategist, visionary, forecaster, educator, historian and advisor who has been involved in the cybersecurity field for over 30 years. He identifies market trends and Is a leading analyst on application security, encryption and the human element. His views and <u>understanding of information and computer</u>

security were shaped during his years at the National Security Agency. There he held a variety of analyst and managerial positions. Following NSA he was a research vice president covering security markets for IDC and then a senior security strategist for IBM Security.

He has authored numerous documents to explain market realities. He has spoken at many security conferences and events, including the RSA Conference, CIO Conference, CEIG, and IANS and been widely quoted in the press. He is best known for naming and defining the Unified Threat Management (UTM) market which continues to be one of the strongest cyber security markets with vendor revenue of \$3 billion per year.

Charles holds a B.A. in Political Science from the University of Massachusetts at Lowell and an M.A. in National Security Studies from Georgetown University.

Speak with the Author: *Charles Kolodgy* at *charles@accelst.com*

ABOUT THIS REPORT

This report is based on an inclusive survey conducted by Accelerated Strategies Group. It involves employees of all levels who are knowledgeable about their organizations use of Low-code/No-code development tools and platforms. This worldwide survey delved into topics not generally investigated. The research was specifically interested in viewpoints on how Low-Code/No-code development efforts handle interaction with external data sources. This brief summarizes and provides analysis of the findings. CData commissioned the research.

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