opticca
a modernization company

Executives & App Modernization:
What Architects Want You to Know About

Why App Modernization Projects Fail

Survey Findings at a Glance

- App modernization is an active and current initiative across the board, with 92% of respondents **planning to or have already started** their app modernization projects.

- However, nearly 4 in 5 software and architecture leaders admit to one or more **app modernization efforts failing**.

- Modernization projects cost an average of **$1.5m** and take an average of **16 months**.

- **Organizational pushback** can hamstring projects before they start.

- **Cost, risk, and complexity** are agreed-upon obstacles to modernization projects.

- When asked what has been missing or has stopped modernization efforts, both executives and architects answered **"prioritization from management."**

- **Architects and Executives** often agree, but not always. They differ on goals, challenges, and reasons for failure.

- **Executives** express the need to speed innovation and respond to business requirements, and cite "expectations" as a top reason for failure.

- **Architects** want to improve engineering velocity, find and train developers, and cite "lack of intelligent tools" as a top reason for failure.

- Differences between what executives and architects say they need speak to two sides of the same coin—the **business outcomes** and the **successful execution** of projects to achieve those business outcomes.

About this research

The Survey was conducted by Wakefield Research among 250 US Software Developers and Architects, with a minimum seniority of Director, at companies of 5,000 or more employees that have been in business for at least 15 years, currently maintaining Java applications, between May 2nd and May 11th, 2022, using an email invitation and an online survey. The margin of error for the survey is +/- 6.2%.
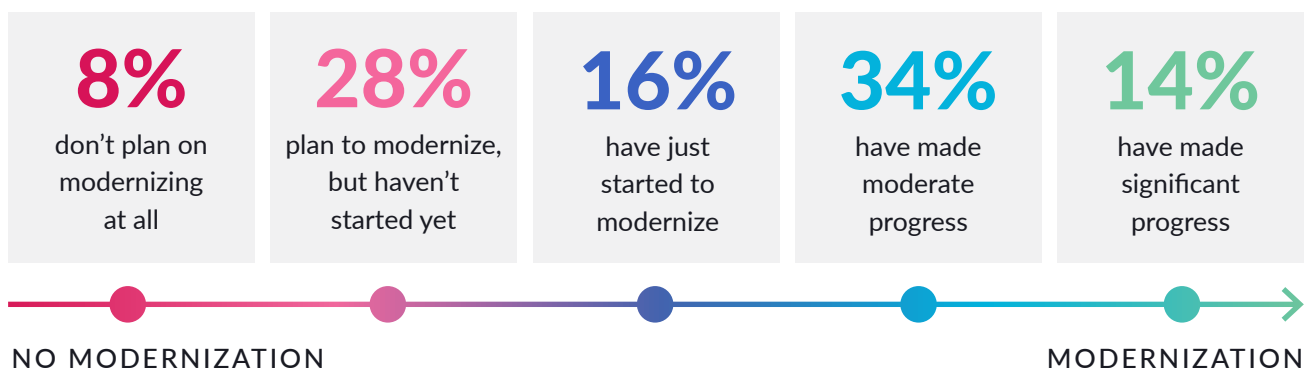
The Time to Modernize is Now

Application modernization is a stated priority for CIOs in the enterprise—a top-three initiative, according to CIO magazine's State of the CIO 2022, in both effort and resources. Additionally, IDC predicts that by 2024, the majority of legacy applications will be getting an update.

Our research supports this, showing that 92% of respondents plan to or are currently modernizing their apps—leaving only 8% who are not planning to modernize in any way. However, modernization projects have proven difficult, with many making only moderate progress.

92%
of respondents plan to or are currently modernizing their apps

The State of Modernization

8%	28%	16%	34%	14%
don't plan on modernizing at all	plan to modernize, but haven't started yet	have just started to modernize	have made moderate progress	have made significant progress

NO MODERNIZATION → MODERNIZATION

Modernization Majority

79% Have Faced Failure—at High Cost

Nearly 4 in 5 software and architecture leaders say they've had an app modernization effort failing along the way. And those failures come at a cost: 74% say that the typical application modernization effort costs $1M+, averaging nearly $1.5M. Beyond the huge financial cost is time. Nearly 3 in 5 (58%) software and architecture leaders say the typical app modernization effort takes over a year, averaging 16 months per project—more than a quarter (27%) say it takes two years or more.

App modernization projects are expensive endeavors—especially when one starts to look at broad application portfolios, with some enterprises having hundreds of business-critical apps to modernize. As such, failed efforts mean time and money down the drain—a lost efficiency in the race against competitors, who unburdened by legacy application portfolios, may outflank them.

79%
App Modernization Efforts Fail

$1.5m
Average Cost of a Modernization Project

16mo
**Average Time of a Modernization Project**

How "App Modernization" is Defined

"App modernization" can be a bit of a catchall across the industry, with many reviewing the different "R"s—replacing, retaining, retiring, rehosting, replatforming (what some would describe as "lift and shift"), rewriting, and finally, to refactoring. While some might define "app modernization" as any one of these Rs, the real experts—both the executives and the architects surveyed agree that refactoring is the one true definition of "modernization," most likely because it is the most effective to get to the microservices architecture needed to take advantage of the elasticity and scalability of the cloud.

The 7 R's of App Modernization

1	Replacing	5	Replatforming
2	Retaining	6	Rewriting
3	Retiring	7	Refactoring
4	Rehosting		

Executives and Architects Agree— The True Definition is Refactoring (60%)
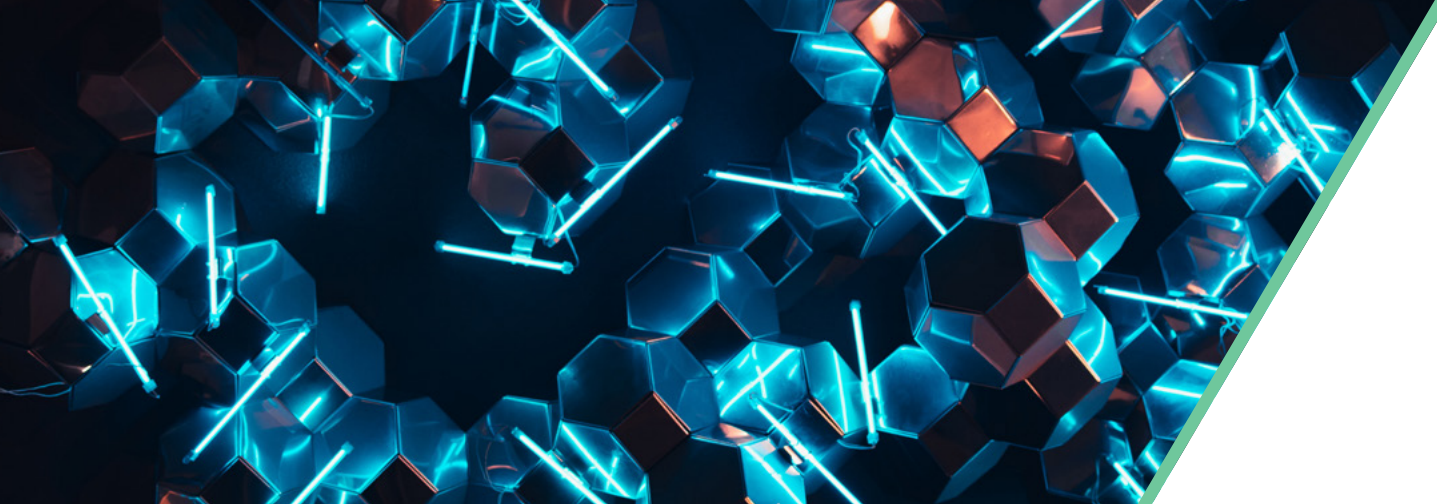
What Is the Goal of App Modernization?

Here's where it gets interesting. Executives rank "investing more in application innovation" as their top priority, while app architects list "improving engineering velocity" as their main goal—this speaks directly to the unique pressures each of these IT stakeholders may feel. This difference also speaks to different sides of the same coin in terms of overall organizational goals: innovation is a necessity to meet business objectives, but the biggest obstacle to innovation is technical debt, which is the antithesis of engineering velocity. Interestingly, architects are also concerned with reducing the ramp time for new developers, a nod to the very real hardship of finding and training new talent to maintain monolithic applications.

Top Goals of App Modernization Projects

	1	2	3
EXECUTIVES	Innovation	Improving Engineering Velocity Lowering Technical Debt	Increase Application Scalability
ARCHITECTS	Improving Engineering Velocity	Innovation	Increase Application Scalability Reduce Ramp Time for New Developers

Projects Faced with Many Obstacles

Internal struggles are putting app modernization efforts in peril before they even start, to the point that 97% predict someone in their organization would push back on a proposed project. It's true that app modernization projects are complex, with some fearing they are too complex to execute. Execs and architects agreed that risk was the number one reason for pushback, but then their answers vary. Executives clearly struggle with the business impacts of modernization projects, while architects suspect a more political impact.

97%

predict someone in their organization would push back on a proposed project

Top Reasons for Pushback

	1	2	3
EXECUTIVES	Risk	Too Costly	The Case for ROI is Lacking
ARCHITECTS	Risk	Stakeholders Fear Large Scale Change	Stakeholders Fear Losing Their Role

Why App Modernization Projects Fail

In looking at what causes failed modernization efforts, there are some noteworthy differences between what executives and architects call out as obstacles, which points to the intertwined—but sometimes opposing—pressures that leaders and architects experience.

Among those who had started app modernization projects and failed, the top reason cited across all stakeholders was "failure to accurately set expectations." Yet in looking at architects alone, they note a "lack of intelligent tools" as the number one reason for failure.

Delving further into the responses of each category, architects respond in an enlightening way with "too complex," "inadequate skills or training," and "failure to accurately set expectations" all tied for the 2nd most common reason for failure.

Clearly, the struggle with ineffective tools and the skills/ training needed to work on complex code laden with fragile dependencies—is real.

When asked what is missing or has stopped modernization projects in their tracks, executives and architects both respond with "prioritization from management." It seems that companies, in their best effort to respond to their customers and the market, are often changing priorities, leaving app modernization projects at risk. Executives rank "budgetary limitations" as the second missing element, while architects cite "intelligent tools" as the second missing element.

Among those who have started application modernization projects, the top tools used are Cloud Migration Tools and Application Performance Management (APM) tools—neither of which are built for refactoring or rearchitecting. This sheds some light on the architects #1 reason for app modernization failures being the lack of intelligent tools.

Reasons for Failure

	1	2	3
EXECUTIVES	Failure to Accurately Set Expectations	Too Costly	Required Org Structure Changes
ARCHITECTS	Lack of Intelligent Tools	Inadequate Skills or Training / Too Complex / Failure to Accurately Set Expectations	Required Org Structure Changes

Making the Business Case for Budget & Resources

Software and architecture leaders struggle to sell the importance of app modernization, a problem that comes from leadership. When asked what was the most difficult step in a modernization project, nearly 50% of executives and architects agree that securing the budget and resources is the most difficult step. Beyond that, the answers divide. Executives reveal their strategic struggle with "knowing what to modernize" ranking second and their leadership struggles by ranking "training and preparing the staff for modernization" as third. On the other hand, architects reveal their need to support, ranking "building the business case" as second, tied with "training and preparing the staff for modernization." Architects also show their desire for successful outcomes and the challenges they personally face in ranking "executing the modernization project successfully" third.

50%

of executives and architects agree that securing the budget and resources is the most difficult step

The Most Difficult Steps in Modernization Projects

EXECUTIVES	Securing Budget & Resources	Knowing What to Modernize	Training and Preparing Staff
	1	**2**	**3**
ARCHITECTS	Securing Budget & Resources	Building a Business Case / Training and Preparing Staff	Executing the Modernization Project Successfully

The Challenges
with Refactoring

Refactoring, while the most common and widely accepted definition of app modernization, presents difficulties. When asked about the challenges of refactoring, executives cite the time it takes, while architects cite difficulty. Most likely both are true—as refactoring is laden with manual burden—the analysis alone of millions of lines of code, and thousands of classes may take months, not to mention the designing, rearchitecting, testing, and deploying of microservices. So, while executives want it done in a more timely manner, architects are stuck untangling thousands of dependencies and searching for the worst written classes contributing most to their technical debt. Architects (again) pointed to a lack of tools—a repeated theme from the research.

The Top Challenge with Refactoring

Executives
Time

Architects
Difficulty

Maintaining Monoliths Is Fraught with Real Challenges

Despite the challenges (and attendant differences among stakeholders) cited around modernization efforts, it's clear there is no alternative. **The survey found near universal agreement (99%) among respondents that they experience hard challenges in maintaining monolithic apps.**

Again, executives ranked their top challenges from a more strategic business perspective, with "keeping up with business requirements." This is insightful as it shows that when it comes to monoliths, simply maintaining the code to allow the business to run as usual—table stakes—is hard. And given that CIOs are now one of the most strategic roles in the company, this makes sense. Not only are they tasked with maintaining business as usual, they are often tasked with building the functionality to give the company the chance to get ahead. Meanwhile, architects speak to "finding developers who can maintain it and ramping them up" as a top challenge. This is a very real problem, as companies today face a number of hiring and retaining challenges. The Great Resignation trend in the market has companies struggling to keep their talent, and when it comes to hiring, new candidates often command exorbitant salaries. Combine those two challenges with the trend that more and more developers are pursuing the skills needed to build cloud-native technologies instead of the ones needed to maintain monoliths.

Architects Agree: Modernizing is a Way for Companies to Get Ahead
When asked what they wanted to share with their CIOs about the current app modernization projects, architects clearly see the strong business outcomes, citing the project as a way to:

"Boost sales and build consumer loyalty"

"Deliver a seamless customer experience"

"Continue evolving the solution to meet business needs as they arise"

"Rapidly respond to trends in order to fuel growth"

"Establish a competitive advantage or gain market share"

Top Challenges in Maintaining Monoliths

EXECUTIVES	Keeping Up with Business Requirements	Keeping Up with Growing Technical Debt / Finding Developers Who Can Maintain It & Ramping Them Up	Finding Time to Add New Features
	1	2	3
ARCHITECTS	Finding Developers Who Can Maintain it & Ramping Them Up	Keeping Up with Growing Technical Debt	Keeping Up with Business Requirements

The Secrets to Successful App Modernization Projects

Among those who have begun modernization projects and have seen progress—be it moderate or significant—we asked what the top reasons for their success were. The #1 answer across the board—with execs and architects in agreement—is "the right organizational structure to support the target modernized architecture." Moving from a team structure where teams are aligned by function to a team structure where teams are aligned around the microservice can be a hard change to make, but one that produces a powerful end-result.

The second most cited reason for successful app modernization outcomes lends to basic project management skills, as well as setting realistic expectations: "we had a sufficiently built schedule or timeline to execute."

The next reason ranked for successful projects includes "deploying the proper resources and/or skilled employees." Putting the right people in the right places is a key to success. This is followed by "we had sufficient budget." We've seen this before—securing the resources and the budget is one of the top challenges with app modernization projects—and yet they are both secrets to a successful project.

If companies find it within their power to adequately fund the projects and align the proper stakeholders, success is that much closer.

Lastly, having "our goals well-defined" was one of the least ranked reasons for successful app modernization projects.

62%
of respondents cite proper resources and tools as the top reason for successful modernization projects

Top Reasons for Successful App Modernization Projects

1 We had the right organizational structure to support targeted modernized architecture

2 We had a sufficiently built schedule or timeline to execute

3 We deployed proper resources and/or skilled employees to the project

4 We had sufficient budget for the project

5 TIE:
We had our goals well defined

We had commitment from management

We had sufficient tools to execute

The Path Forward:
Guidance for Executives

With app modernization projects as a top priority for so many companies, what is the best course of action for both executives—and their architects— as they forge onward?

1. Make the Case

One way to create greater alignment around goals is to help architects build a business case for the project, doing the best to quantify the expected business outcomes, and to realistically scope the necessary cost and time. This lends itself to the next step. We suggest first starting with the application portfolio, analyzing each one for architectural complexity, technical debt, and identifying aging frameworks. From here, the prioritizations are made, and then scoping time, budget and team members needed can be aligned.

Architects Say: *"The fear of modernization puts us in a subordinate position in our industry." "Meet the demands of a changing market as well as to improve the function of our business." "Provides supportive agility to fulfill customer's demands." "The most important way to start any application modernization project is with an application assessment."*

2. Secure Budget & Resources

Execs and architects agree that when projects failed, this was the key thing missing. Armed with a strong business case, securing the budget and resources needed to succeed may be easier— especially when tied to the strategic business outcomes expected.

Architects Say: *"We've gotten to the point where it's an absolute must, and more budget is needed." "That not enough time and resources are given to app modernization." "Please keep increasing our budget." "Investing more will reduce our operating cost." "We need a lot more resources."*

3. Give It Consistent Support

Priorities often shift quarter to quarter, though keeping a keen eye on the support of these modernization projects is an element of success. Given that these projects often take 1.5-2 years to finish, the support needed from executive management through changing tides is key. After all, losing sight of it in priorities and faltering on commitment often stall, stop or end app modernization projects.

Architects Say: *"We need to prioritize it more." "Know the priorities." "Learn to prioritize." "Stay focused and objective and innovative."*

4. Define, Align, and Train the Team

Looking across your team to understand what skills are in house already, and what skills need to be added to the team is the first step. Then gathering stakeholders and putting the right people in the right roles come next. Finally, organizing your team around the targeted microservices is critical to the success of an app modernization. This is a fundamental shift in the thinking behind team structure—and making the change may be hard—though it will be worth it in the end. But don't stop there— make sure to invest in proper and adequate training.

Architects Say: *"It's hard to find the right people in position." "Must invest in training." "Please do not skimp on the training." "Worker training is a big issue." "Each function needs time and practice in order to execute properly."*

5. Provide Your Architects with Intelligent Tools

Among architects, having the right tools was cited as the least common answer for when projects succeeded, yet the need for/ lack of tools ranked high among architects when asked why modernization projects fail. This points to a lack of intelligent tools that can help architects and engineers reduce time and risk.

Architects Say: *"We still lack the tools to do it properly." "Having more automation tools means faster release times and better modernization processes."*

About Wakefield Research

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