

3forge Insights

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# The Future of Capital Markets Technology: The Path to Low Code



CELENT



# 3forge Insights

In our day-to-day work with capital market participants, we are witnessing a shift in front and back-end application development and IT infrastructure strategy. We see this change spurred on by the boom in data requirements, as well as the ongoing need to combine increasingly disparate legacy systems.

Celent – a leading research and advisory firm specializing in Financial Services – recently explored the whys of this transition and its implications in greater detail. The result of their effort is the enclosed report – an objective analysis of how the app stack for capital markets is evolving. The research considers buy and sell side business users and technologists.

The report also takes a deeper look at the key technologies capital markets firms have to consider to thrive in the future. Low-code is highlighted as a major component of this new toolkit due to its many attributes.

3forge's mission is to empower developers with a future-proof application development platform as well as support business users with performance, scalability and flexibility. In that spirit, we are pleased to share this report to continue a dialogue with you to better understand your unique goals and challenges.



Robert Cooke  
CTO, 3forge

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# THE FUTURE OF THE CAPITAL MARKETS APPLICATIONS STACK

The Path to 2030 with Low Code/No Code Platforms

February 24, 2021

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# EXECUTIVE SUMMARY

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When it comes to the capital markets, a shift is underway in the process of application development. This is driven by increasing demands across heterogeneous technology and application stacks for ease in business value. The biggest opportunity today for firms is to rethink their approach to how they build, buy, and bind their complicated tech and app stacks in this time of exploding data, digital demands, and cost pressures. A revolution in the application stack in the capital markets is underway:

The capital markets of 2030 will require bundled services, deep data insight, and extension of technology to partners beyond just transactional services. There will be a core shift in priorities of data and technology and how applications will be built.

The aspiring winners in the race to 2030 recognize that full-suite offerings of data, advanced analytics, and technology is the key to future success.

The path to the capital markets application stack of 2030 requires an evaluation of how firms create applications that are flexible and can adjust to changing business requirements.

A change in mindset does not mean ripping out the legacy systems, or completely remapping highly siloed trading, risk, compliance, and surveillance stacks front to back in financial institutions; it means creating a path to consistency in ensuring all stakeholders have access to the right data, in the right form, at the right time, with the right latency.

This path requires a move beyond project-by-project thinking to a holistic approach that tasks the right coding talent with the right tools, rather than a constant exercise in reinventing the wheel.

This approach frees up top developers for mission-critical builds. It incorporates binding tools like low, no, and zero code platforms that are increasingly showing their value in the capital markets. This allows for better management of risk and agility, and diminishes technical debt by massively lowering wasted and inefficient code.

This is a path that will put more tools directly in the hand of core business and development teams that can quickly get to market, thereby bypassing the difficulties that businesses are having with centralized IT.

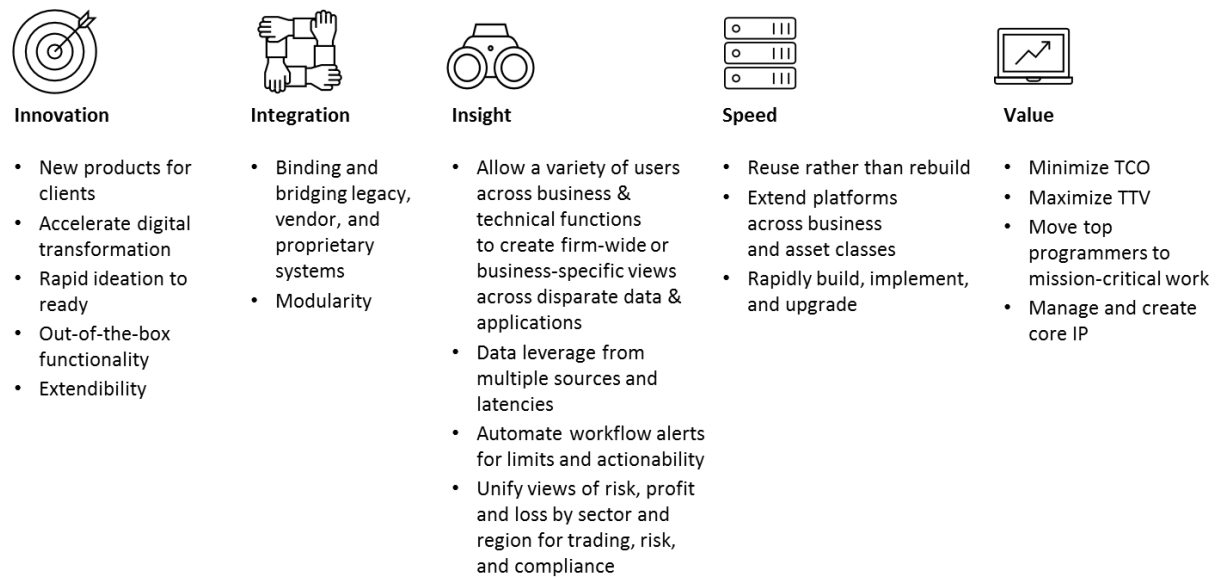
Technology is such a key part of the capital markets today that the demand for new business features has pushed much of the application development

processes to its limits. Purpose-built capital markets platforms offer speed, agility, and automation in building, buying, and binding across disparate data, application, and technology, as well as different types of business and development users.

In the past, there were no alternatives to this cycle of build and rebuild. The modernization of software creation needs to be “less sandbox, more tool kit.” Low code is seen in more application development today. It is not just insight, but also workflow, automation, and actionable use of data. It is becoming better suited to the performance and scale required in the capital markets.

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**Figure 1: The Path to 2030 with Low Code/No Code**



Source: Celent

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# INTRODUCTION

2020 highlighted some of the challenges in capital markets that can move with enough speed to overwhelm most systems. Participants in the institutional capital markets are finding it hard to keep up with the explosion of data. This data is a by-product of the continued move to electronic trading, which grows by 50% a year.

COVID-19 was a stress test on the operational, technology, and data fronts. The unexpected “COVID testing” during the extreme market volatility exposed vast differences in performance across trading and operations.

The capital markets ecosystem has grown up in distinct and difficult to breakdown silos across asset classes. Infrastructure, front, middle, and back office have evolved along separate lines. Creating robust interoperability or insight atop these disparate stacks is a massive task, creates high risk, and slows new business opportunities.

Future proofing technology and application development today is key to being in business in 2030. Emerging trends point to bundling technology, data, analytics, insight with services to meet ever-increasing client demand. Moreover, offerings will require ever greater tweaking as we enter age of institutional customization. These trends will be the case for internal clients and external customers across the all capital market participants.

Demand for better, faster, and flexible applications have led to rapid changes in adopting modern application architectures like microservices, the rapid rise of agile development, as well radical shifts in DevOps in the software creation and update cycles. Tools to meet these needs that accelerate the development process for both coders and business users are easing automation, workflow, and repeatability for application development.

In this paper, we look at the steps capital market participants need to take with their current applications and technology estates, on the path to 2030. We explore the case for using low code platforms as another tool in the toolbox of technologists and business users. Celent spoke to buy side and sell side business users across tiers and technologists, as well as to low code/no code providers. We use a capital market perspective, with an eye on the sell side, and other firms with substantial application development.

## Today's Capital Markets

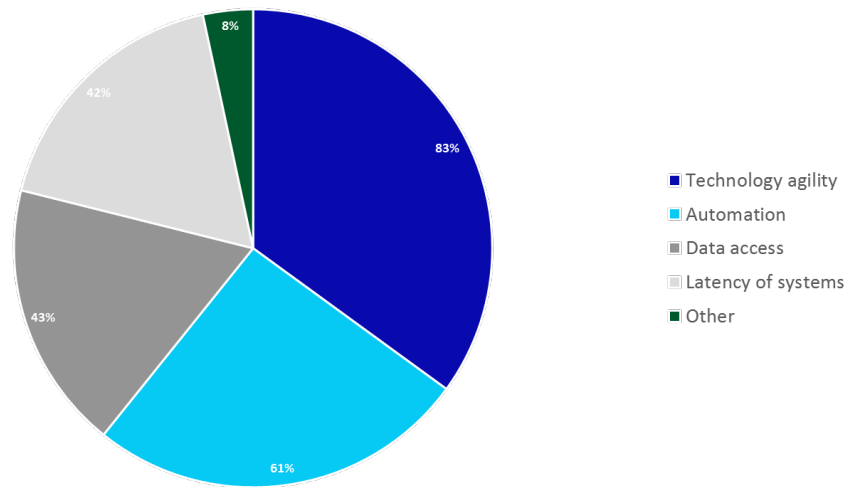
Market, competitive, and regulatory forces are reshaping the capital markets. The competitive landscape of the ecosystem as sell side, buy side, and infrastructure players, means rethinking business models, risk, data, and connectivity in an increasingly capital-constrained and regulatory-demanding environment. There is a

continuation of the drive toward cost-cutting, replanning architecture, and app delivery.

Figure 2 below shows a recent Celent survey exposes key demands that financial institutions require for their technology and application state. These demands are driving massive shifts in the capital markets considerable investment into new technology platforms.

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**Figure 2: Demands Today in the Capital Markets**



Source: Celent, n=47

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# THE PATH TO 2030

## The Road to Innovation

Changing needs and speeds requires firms to escape the mindset of rebuilding, recoding, and overall redoing over and over again. This creates a massive build-up of technical debt and difficult code.

For instance, it is almost impossible to consider building a custom database for every new project. It is certainly easier to look at the type of demands and pick the appropriate database. Yet, not that long ago, that was not the way it was done until the development of a “database” industry. Firms can still build their own databases, but the value is the *configuration*, i.e., the data, which is the IP. Likewise, application development is not valuable in itself; it’s the *results*, and the *ease* in which it can be used for the needs of the business of the firm’s IP that are.

Yet, most firms are doing this at every level of code, infrastructure, etc., when this is not their business. Certain things we take for granted today and continue to do seem almost ridiculous when seen in the context of the evolution of application building.

Rather, speed to market, integration, future changes, and optimizing coding talent leverage will drive the application building process.

## The Morphing Application Stack: Building, Binding, and Buying

There is a time to build, and a time to buy. There is more and more build and buy, which requires a means of robust integration.

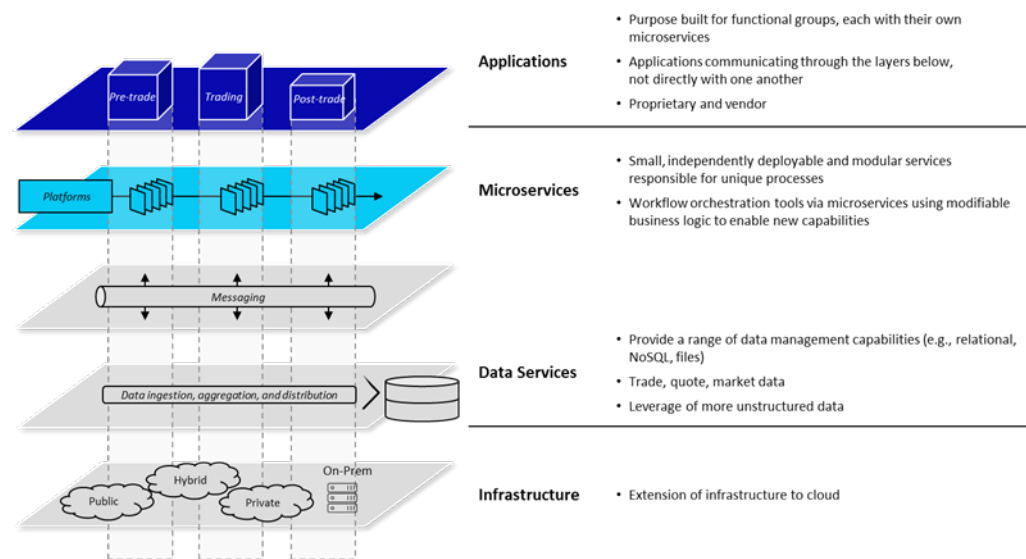
The balance between customization, cost, and speed, is often solved by both buying and building with the correct binding of systems. Continually making code changes magnifies risk, cost, and technical debt.

Today’s technology cycle has compressed from 10 years to 3 years the time span of legacy to “fintech.”

## The Functional Application Stack

The emergent application stack needs to mitigate risk, lower cost, and drive higher future profitability. Figure 3 shows a path to application development at the business level, while allowing a more holistic infrastructure below that allows access to crucial data flows. There are key factors in modernizing technology and application processes. Emergent platforms that are orchestrating data, security, functionality and connectivity will play a key role in moving into the next decade.

**Figure 3: The Emergent Stack in the Capital Markets**



Source: Celent

We now explore the demands that will be put on capital markets application development in 2030.

# THE CAPITAL MARKETS 2030

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It always seems impossible until it's done.

—Nelson Mandela

The capital markets in 2030 will be defined by fusing data, technology, and services into extendible offerings that move beyond the mostly transactional nature of today's business. Celent sees the following key themes defining the future of capital markets:

- **Insight:** Competitive differentiation is moving to advanced data management.
  - Content and data insight, management, access, analytics, and AI will be the competitive differentiators.
  - Platforms will allow real time data access across a firm that can aggregate and take actions across a landscape of business applications, creating a clearer picture of risk, compliance, and exposure of other key metrics.
  - Data, its analysis, and extendibility to internal stakeholders and external partners will be crucial.
- **Technology:** Rise of ingrained intelligence.
  - Adding content to compute, and balancing specific point solutions within a holistic application development and management, will be crucial.
  - Real time, transparent, simplicity, common, reusable, and modular tech are necessary building blocks.
  - Interoperability of best-of-breed vended, open source, proprietary components will be a given.
- **Infrastructure:** The move to colocation and the cloud is just beginning.

- Data centers and massive server farms will fade away.
- **Applications:** Speed, organization, and agility, rather than bespoke coding, will be a competitive advantage.
  - Application code will be a process-fast and data aware.
  - Applications that can be adjusted on the fly without impacting the overall technology stack will be ideal.
  - Low code and microservices approaches will dominate.

A path that will ease application development today, and ensure that the full extension of data, technology, and services are available in the next decade, will include platforms that speed the delivery of applications to internal and external capital markets clients.

# C–O–D–E: LOW CODE/NO CODE

Low code/no code is a varied set of solutions—a broad spectrum of components that can be used by business analysts and developers.. Broadly defined, it’s an abstraction layer that sits above code that allows certain tasks to be done easier. The most advanced platforms provide insight, workflow, and actionability. While many developers will balk and say there is no replacement for their abilities, the trend is to always move to greater levels of abstraction in coding. Fortran was the first “*human language*” code, and C++ was a more highly abstracted assembly language. The promise of low code is rapidly creating useable firm IP.

## Capital Markets Low Code/No Code

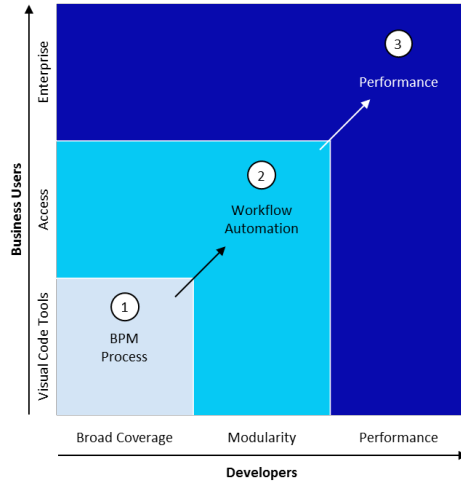
Low code/no code in capital markets comes in a variety of shapes. They will have domain expertise, performance, and the right connections to key data, vendor, and messaging infrastructures. They allow developers and other business users to rapidly deploy, and they offer traders, compliance, risk, and management the ability to get the insight they need at any speed. The compelling types of solutions for the capital markets are those that allow developers to build and deploy rapidly, provide flexibility in the approach to data, and allow business users to make changes as they use the applications for specific purposes.

It is a modular approach to coding in the way that the cloud is a modular approach to infrastructure. In the capital markets, the key solutions will have the domain expertise and prebuilt adapters, and will speak the native languages that pulse through trading firms and investment banks.

Figure 4 is a broad sweep view of the different types of solutions that are taking place in low, no, zero code platforms. The core value proposition puts tremendous data leverage and application development into the hands of data scientists, coders, and business users who can create value rapidly.

**Figure 4: A View of Types of Low Code and No Code Platforms**

**The Dimensions of Low Code/No Code**



**Platform Types**

① <b>Horizontal</b>	<ul style="list-style-type: none"> <li>• BI/BPM</li> <li>• Code generation</li> <li>• Web apps</li> </ul>
② <b>Workflow</b>	<ul style="list-style-type: none"> <li>• Data orchestration</li> <li>• Data visualization</li> <li>• Automation</li> <li>• Secure environment</li> </ul>
③ <b>Capital Markets</b>	<ul style="list-style-type: none"> <li>• Performance for capital market needs</li> <li>• Configurability/flexibility</li> <li>• Integration to core vendor, data, databases</li> <li>• Developer tool kits</li> <li>• Advanced data orchestration with high performance</li> <li>• Out of the box and “developable”</li> </ul>

Source: Celent

Low code/no code is an approach that creates a rapid time to value (TTV) to building solutions. That is--don't build a compliance engine and a trading platform separately—leverage the same tool kit. Some see it as the evolution of coding, intrinsic in all applications, while others see it as a tool for managing automation across applications. Platforms that do it correctly will create a path to easier access to underlying data without centralizing the data.

Celent sees speed, repeatability, scalability, security, and workflow automation driving low code/no code forward in the capital markets. The true value will be the speed in which firms can create valuable IP.

**Innovation**

- Rapid innovation to get to new solutions or minimum viable product.
- Accelerate digital transformation.

- Build rapidly with plug-and-play tools configured for security and functionality.

### **Integration**

- Bridge gaps in proprietary technology or missing attributes of vendor solutions.
- Modular approach to building business applications.
- Connecting build to buy.
- Integrating between legacy systems and ease, leveraging them into modern data connectivity.
- APIs for integration across systems.

### **Insight**

- Allow various types of users across business and technical functions to create firm-wide or business-specific views across data sets and disparate applications.
- Functionality for administrators, business, risk, compliance, and operations users.
- Visual data representation.
- Pulling disparate data at line speed that can be used by all stakeholders.
- Allow for insight from different data sets at widely varying data velocity, i.e., algorithms, human traders, and surveillance.
- Creating automation workflow alerts for limits.
- The ability to pull data sources from multiple file types, data sources, and messaging buses with ease in scripting that can be handled by compliance and trading staff.
- Mitigating constantly; going to multiple dashboards for risk views.
- Unify views of risk, profit, and loss by sectors and regions.
- Allowing real time compliance alerts, trader insight, and risk alerts on trading-limit breaches with same tools.
- Tools for managing all levels of data ingestion, orchestration, access, and storage.
- Monitoring of key logs, alerts, network performance, and access.

### **Speed**

- Rapid ideation to ready.
- Rebuilding a new platform that has historically been used in equities for use in another asset class.
- Reusing similar platforms across business and asset classes.
- Rapidly implementing client upgrade demands.
- Businesses can rapidly build for their needs while managing operational risk of these efforts.

### **Value**

- Minimize total cost of ownership (TCO).
- Maximize TTV.
- Move top programmers to mission-critical work.
- Manage core IP more carefully.

Figure 5 summarizes key benefits and attributes of low and no code.

**Figure 5: ABCDs of C-O-D-E**

Area	Impact
<b>A</b> Innovation	<ul style="list-style-type: none"> <li>• Rapid innovation to get to new solution or MVP</li> <li>• Accelerate digital transformation</li> <li>• Build rapidly with plug-and-play tools configured for security and functionality</li> </ul>
<b>B</b> Domain Expertise	<ul style="list-style-type: none"> <li>• Bridge gaps in proprietary technology or missing attributes of a vendor solutions</li> <li>• Modular approach to building business applications</li> <li>• Connecting build to buy</li> <li>• Integrate between legacy systems and ease leveraging them into modern data connectivity</li> <li>• APIs for integration across systems</li> </ul>
<b>C</b> Insight	<ul style="list-style-type: none"> <li>• Allow various types of users across business and technical functions to create firm-wide, or business-specific views across data sets and disparate applications</li> <li>• Functionality for administrators, business, risk, compliance, and operations users</li> <li>• Visual data representation</li> <li>• Pulling disparate data at line speed that can be used by all stakeholders</li> <li>• Allow for insight from disparate data sets at widely varying data velocity: algos, human traders, surveillance</li> <li>• Create automation workflow alerts for limits</li> <li>• The ability to pull data sources from multiple file types, data sources, and messaging buses with ease in scripting that can be handled by compliance and trading staff</li> <li>• Mitigate constantly, going to multiple dashboards for risk views</li> <li>• Unify views of risk and profit and loss by sectors and regions</li> <li>• Allowing real time compliance alerts, trader insight, risk alerts on trading limit breaches with same tools</li> <li>• Tools for managing all levels of data ingestion, orchestration, access, storage</li> <li>• Monitoring of key logs, alerts, network performance, access</li> </ul>
<b>D</b> Value	<ul style="list-style-type: none"> <li>• Minimize TCO</li> <li>• Maximize TTV</li> <li>• Move top programmers to mission-critical work</li> <li>• Manage core IP more carefully</li> </ul>

Source: Celent

Out-of-the-box functionality will get firms interested in low code, but the ability to create their own secure, fast applications will open check books.



# PATH FORWARD

There has never been a more compelling time for a rethinking of capital markets trading technology, application development, and the process for managing and creating technology solutions.

Many wonder if, with billions spent on IT and the rising proportion of a bank's revenue, what these costs represent is sustainable, but moreover, whether true value is being created. The problem needs to be considered from a business model, network, data, and technology perspective. As markets converge and become more electronic and more data driven, this becomes more profound.

Underpinning all the challenges is the importance of technology and data strategy, and how solutions have evolved over time. For someone in a senior role in the capital markets, it was never conceivable that the spend on technology would be in the hundreds of billions just to keep the lights on.

Low code/no code will become more and more important. Like cloud on the infrastructure side, or DevOps on the production side, it will become an important tool in easing the management, development, and organization of applications in the capital markets. It will bring, strengthen, and unify the needs of the business and align technology with those calls. Places where they cannot be leveraged are, perhaps, the best places to allocate the time of a firm's best software developers.

There will be challenges in adopting the right methodology for firms to best employ these platforms and to find the projects that demonstrate the highest value, but like so many other shifts that have occurred, it is important to recognize this opportunity.

Never let a good crisis go to waste: COVID-19 is an opportunity to avoid kicking the can down the road, with solutions that solve challenges today and create a more future-proof application stack on the challenging road to 2030.

# LEVERAGING CELENT'S EXPERTISE

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If you found this report valuable, you might consider engaging with Celent for custom analysis and research. Our collective experience and the knowledge we gained while working on this report can help you streamline the creation, refinement, or execution of your strategies.

## Support for Financial Institutions

Typical projects we support related to policy administration systems include:

**Vendor short listing and selection.** We perform discovery specific to you and your business to understand your unique needs better. We then create and administer a custom RFI to selected vendors to assist you in making rapid and accurate vendor choices.

**Business practice evaluations.** We spend time evaluating your business processes, particularly in policy administration, rating, and claims. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

**IT and business strategy creation.** We collect perspectives from your executive team, your front-line business and IT staff, and your customers. We then analyze your current position, institutional capabilities, and technology against your goals. If necessary, we help you reformulate your technology and business plans to address short-term and long-term needs.

## Support for Vendors

We provide services that help you refine your product and service offerings.

Examples include:

**Product and service strategy evaluation.** We help you assess your market position in terms of functionality, technology, and services. Our strategy workshops will help you target the right customers and map your offerings to their needs.

**Market messaging and collateral review.** Based on our extensive experience with your potential clients, we assess your marketing and sales materials—including your website and any collateral.

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