CIO
APPLICATIONS

API EDITION
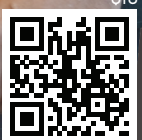
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COMBINING FORM BUILDING AND API CREATION INTO ONE STEP

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COMBINING FORM BUILDING AND API CREATION INTO ONE STEP

By Joe Phillip

One can define "Collaborative Leadership" as a voluntary partnership between two or more leaders with the unified goal of sharing responsibilities based upon their complementary skillsets. A Gartner research found that leaders who embrace this unorthodox style of leadership witness a 60 percent upturn in their teams' efficiency and a 40 percent surge in their own performance.

If there is an organization that can truly attest to the benefits of collaborative leadership, it is Form.io, a Dallas-based software platform company with a strong Open Source core that provides developers with a combined Form-building and API creation solution. Its three-headed team of Co-founders includes CEO Gary Wetzel, CTO Travis Tidwell, and CBDO Denise Kay, who contribute their respective strengths to foster a collaborative culture throughout

the organization. Wetzel points to the trio having a long history of working together, and to their equally balanced contributions to finance and administration, technology development, and sales and marketing to producing a well-oiled organizational machine. "We complement each other's skillsets, and have always leveraged our respective strengths to create clarity while serving our customers in the developer community," he says.

It is this "clarity" that spurred the conception of Form.io in 2015, to solve a glaring industry pain point that arose just a few years before at the start of the decade. 2010 brought the proliferation of a wide range of mobilized devices and the emergence new software development mandates that included enabling big data, IoT, microservices, and of course mobilized applications. The combination of these new mandates created what Tidwell calls a "disruptive web development chasm", and caused developers to re-architect their approach to building web applications, and forced

them to embrace API-first development processes. The early stages of what is now known as the "progressive web application movement" was underway and accelerating into high gear. This in turn gave rise to today's next-gen solutions, which leverage new javascript frameworks, cloud-based services, and data containerization technologies. However, developers continued to be hamstrung specifically with respect to building form-centric, data collection, business process applications. Existing platform solutions still required forms to be rendered as HTML from the server side, and then be delivered to the application level for rendering on each and every request. In the new age of mobilized web apps, with decentralized user interfaces and offline mode operation, this form rendering process proved to be increasingly non-performant and problematic.

Form.io began with a simple insight into the opportunity to help developers simplify the separate

time-consuming steps of building forms and creating the data management APIs that support them, by enabling them to build forms and APIs in one unified step by using a simple drag-and-drop form-building process to build both—even without the need of any coding. "Form.io was built specifically to be a fully-integrated low code form-building and API creation platform for developers who are building complex form-based, business process workflow applications for themselves or for their own clients," elaborates Wetzel.

> There has been a significant increase in Form.io customers who want to quickly build data collection applications surrounding COVID-19

Five years into its inception, Form.io has evidently succeeded in its mission: to be the industry standard combined Form building and API creation platform for software developers around the world and in every business vertical. Today, its platform solutions are used by customers ranging from disruptive startups, to SMBs, and large enterprises around the world, and across government, healthcare, banking and finance, insurance, education, industrial mfg, online retail, and many more, including the global technology consultancies and development agencies that serve them. These include two arms of the United Nations, the Federal Reserve Bank, the European Central Bank, numerous federal, provincial, state, and city-level government agencies, as well as many global technology companies such as Accenture, Deloitte, McKinsey, KPMG, and Booz Allen, and many others.

A Make versus Buy Decision
It's important to recognize that all of these clients choose Form.io in the context of a fundamental "make versus buy" decision. These customers are seeking a prebuilt combined form-building and API creation solution that can be fully integrated into their data collection applications on the frontend, and integrated into their own servers and databases on the backend, without compromising control or data security.

The result?
Besides providing significant increases in capabilities and reducing development time and cost, the Form.io platform

solution offers customers the benefits of a "make" solution, without them having to make it. This means the platform is delivered to them in a way that enables full integration, configuration flexibility, scalability, and extensibility, all while maintaining their data security and control within their own on-premise or private cloud environments. Wetzel adds, "What makes us unique is that our customers can use our platform as a fully integrated developer middleware solution running in their own environments and on their systems as though it was their own "make" solution.

So, how exactly does the Form.io app provide clients with such a powerful integration capability?
It boils down to Form.io's ability to deploy their API servers into their customer's on-premise or private cloud environments (AWS, MS Azure, Google, or on-premise). This unique capability provides customers 100 percent control of their JSON form definitions that are embedded directly within their own applications, and over their form submission data that also remains in their own environment(s) at all times.

Furthermore, Form.io is entirely a REST API platform, allowing customers to build fully-independent progressive web apps where the only communication between the app and the servers is through the REST API communication. "Such an architecture enables the decoupling of apps, and liberates the apps from the servers," emphasizes Denise Kay, while adding that it facilitates high availability of the platform, scalability, and allows Form.io to address some complex requirements such as functioning in offline mode.

Enabling "Offline Mode" Applications
Speaking of offline mode, Form.io understands the critical importance of today's web apps being able to serve decentralized mobile user interfaces. With the mobilization of these web apps comes the need for them to be able to operate with limited access, or no access, to the Internet, and hence, without having contact with the remote servers that support them.

This new "offline mode" operating mandate makes it particularly difficult to accommodate form-centric, data collection, and business process workflow applications. Forms almost never operate in isolation at the local application level, and are often highly integrated to data input sources and output endpoints that reside on one or more backend servers. "Forms function as the application level UI to the remote data sources and endpoints on the backend. These forms commonly require complex multi-page wizards, integrated user authentication, hierarchal roles and permissions, validations on the frontend and

backend, conditional logic, and workflow," informs Wetzel. As a result, form-centric, data collection, business process workflow applications are notoriously difficult to manage in a mobilized decentralized user world.

This is where the Form.io platform is a game-changer. The platform generates dynamic JSON driven forms that are rendered directly at the app level, without the need to access the server, and can operate easily within these challenging mobilized "offline mode" applications.

These offline apps have proven to be particularly useful for production or equipment compliance reporting applications across the globe where compliance reporting is still done with paper on a shift-by-shift basis. Through the Form.io platform, companies are able to build tablet-based compliance reporting apps with complex forms, roles and permissions, PDF printing, all with offline mode operation. Additionally, these form-centric applications can include approval process workflows without requiring additional BPM engine software.

Also, unlike its competitors, Form.io enables customers to integrate an unlimited number of third-party microservice API endpoints. This capability facilitates triggering notifications, enabling data inputs into the forms and data output to external databases, sending emails, and any other integrations—including API endpoints into a customer's own backend legacy database system.

Rather than building forms directly into the customer's app, Form.io's developer-centric platform enables developers to work collaboratively inside their own dedicated form building portal. As a result, developers can build the parameters and features around the forms, such as user authentications, roles/permissions, validations, notifications, and conditional logic.

Once developers complete this step, the Form.io platform produces a JSON Schema, which defines the form. "Why is that important? Because we render the JSON forms directly within the customer apps, using the Form.io embedded javascript renderer," emphasizes Travis Tidwell. This direct embedding of the form into the customer applications provides Form.io users with complete control of the design, CSS, HTML, mobiled behavior, and the app-level logic.

Furthermore, the JSON Schema is not used only to define and render the form in the app, but also to define the Submission API on the server that the app runs on. What does this entail? Tidwell calls them "JSON-driven dynamic forms that are directly embedded in customer apps, running on dynamic JSON-driven APIs residing within their own JSON driven databases anywhere they want."

software developers, IT managers, and non-developer business process owners—across the world—share a common goal, which is to extract the form-building process out of the IT department. "Business process owners want greater control, increased flexibility, and quicker turnaround times when building the forms they need to run their business," says Kay.

Although time-strapped developers and IT managers are more than happy to rid themselves of this responsibility, it is easier said than done. "It's not an easy task to provide non-developers their own form building and form management interfaces while, at the same time, maintaining the intrinsic requirement for these forms to function as being fully integrated to the technology environments they work within," explains Wetzel.

To tackle this pain point, Form.io offers the Form Manager Application

THE PLATFORM OF PLATFORMS
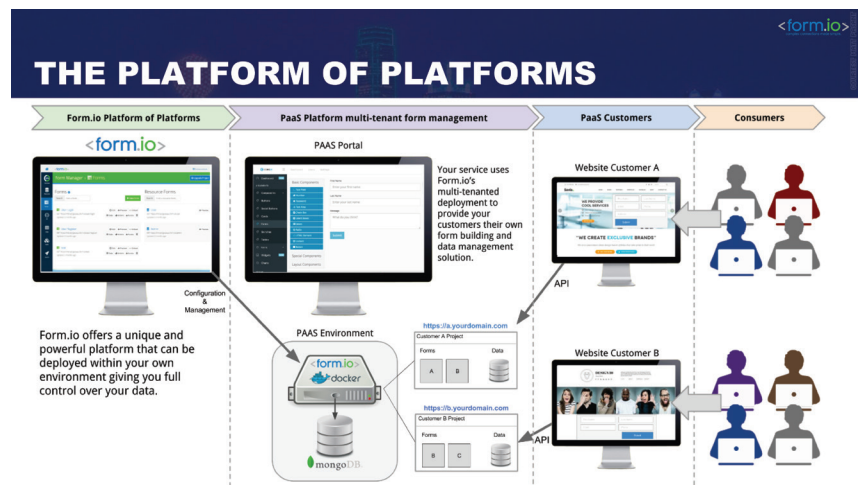
Enabling Non-Developers to Build Forms Too

Another boon of the Form.io platform is its ease-of-use, allowing even non-developer business process owners, and non-developer staff employees to build forms through its no-code form-building solution.

The importance of this feature cannot be understated, especially since

as part of its solution. The application is a fully white-labeled, customer-branded, configurable form building and data management application that runs within customer environments, serving non-developer user stories. This allows groups of non-developer business process owner and staff resources to build and maintain their own forms, and have access

to their own submission data, without having to write a single line of code. At the very same time, these forms are running behind these scenes on the developer-centric Form.io platform, enabling these forms to be controlled and integrated into the company technology architectures as desired.

Built to Address Data Security and Control Compliance Requirements

Form.io does not lag behind with regard to data security, control, and compliance, either. The company understands that regardless of the industry segment, business process applications across the globe have increasingly complex and critical requirements with respect to data security, control, and compliance. This presents developers with the need to implement technology solutions that operate entirely within their own control and environments, and to avoid introducing external third-party organizations and systems into their solutions.

Unlike a hosted SaaS solution, the Form.io platform is most commonly deployed directly within customer controlled environments, either on-premise or private cloud, and is therefore most commonly configured as a fully deployed software development middleware platform.

Since Form.io has no access to customer systems, their forms, or their submission data at any time, Form.io is entirely "out of scope" with respect to security compliance and audits. In addition, Form.io provides submission data encryption in transit and at rest. In other words, Form.io completely "integrates into a customer's environments," giving them absolute peace of mind as it pertains to their data security and control over their data submissions.

A Step-by-Step Approach to Adopt the Solution

During the first step of the onboarding process, the customer is encouraged to try the platform for free, following which Form.io provides them with an introductory call to underline its unique value proposition. The calls are followed up by a technical deep-dive discussion where Form.io addresses any specific requirements that the client might have. Thereafter, Form.io often supports clients with professional developer support services for training or to build a PoC app for the client.

As noted before, Form.io's global market footprint extends to several international government agencies. One such client is the State of Ohio that uses a Form.io-built central hub and shared services technology solution to serve hundreds of its agencies across the state. "They use Form.io to deliver these agencies their forms into their website apps," says Denise.
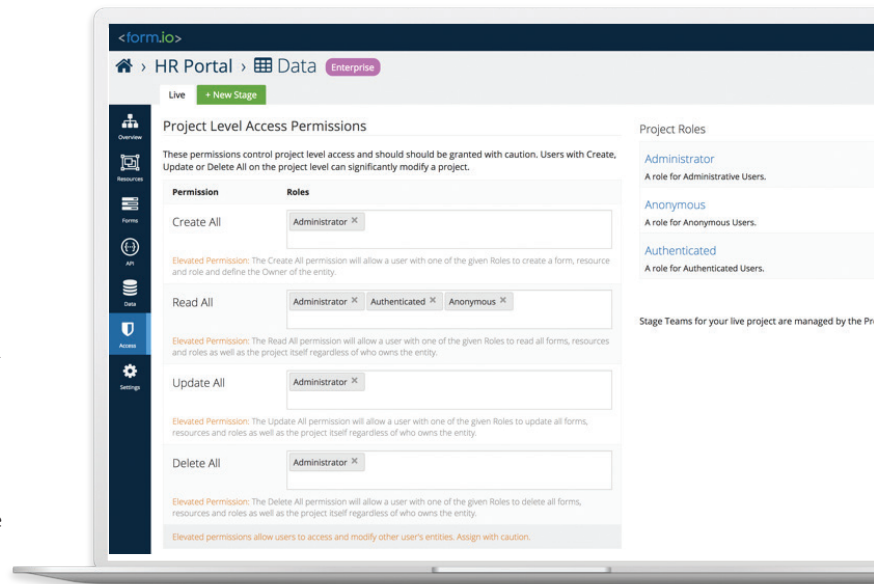
It is important to highlight that besides serving large enterprises, Form.io is also serving 70,000 individual developers in the open source community, who have formed a passionate and active rapidly-growing community on Github.

There is little doubt that an exceptionally bright future awaits Form.io, which recently introduced to the market a new PDF form solution to provide customers with a uniquely combined digital web-form and PDF form both with dynamic JSON-driven capabilities. In light of the ongoing COVID-19 pandemic, Form.io has also witnessed a number of its global clients—especially in the healthcare and government sectors—use the platform to build data collection apps. "There has been a significant increase in Form.io customers who want to quickly build data collection apps surrounding COVID-19," informs Denise.

Driving ahead, Form.io is particularly focused on extending its progressive web app offline capabilities, especially with the requirement for business process apps to operate in the cloud without the need for servers. Wetzel stresses that Form.io is uniquely positioned to cater to this requirement, by leveraging and while maintaining its commitment to its open source software (OSS) core platform.

Some of the other impending developments include Form.io investing heavily in complex, multiple database architectures, or distributed database architectures. The company also looks forward to expanding its PDF form replacement capabilities. "At the end of the day, we are in the trenches with the developers because of our unique perspective. We experienced the problems that our clients are facing today, and that's why we are able to relate to them," concludes Wetzel. CA

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The annual listing of 10 companies that are at the forefront of providing API solutions and transforming businesses