blackbaud

SKY Developer

Empowering Developers Everywhere

Contents

Take a deep dive into Blackbaud SKY®, our cloud platform powering social good innovation. With a robust developer toolkit, an ever-growing community is now expanding and extending capabilities available through Blackbaud SKY, helping transform the future of good.

Introduction

A critical aspect of the technical vision for Blackbaud SKY, our cloud platform powering social good innovation, is to provide a powerful toolset that enables developers both inside and outside of Blackbaud to code for good.

SKY Developer delivers on that vision by providing a complete framework for developers to create and deploy self-contained services within the Blackbaud SKY platform. Blackbaud exposes internal tooling to third-party developers, and they can create offerings that are consistent with Blackbaud products and integrate seamlessly with our native offerings. This enables Blackbaud partners and other developers to augment and extend capabilities in Blackbaud SKY solutions. Ultimately, SKY Developer means Blackbaud customers benefit not just from the innovation of Blackbaud's own large team of developers but also from an exponentially larger community of partners and third-party developers.

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"And we do that by building contemporary REST APIs over the breadth and depth of Blackbaud capabilities. We provide user interface components to develop web applications that adhere to Blackbaud's design philosophy. And we produce and support add-ins that allow developers to complete experiences that our customers have by augmenting out-of-the-box capabilities with their own custom functionality."

SKY Developer provides several tools that are designed for ease of use and scalability, as well as to be extensible and work well with contemporary developer tools.

SKY Developer Tools

SKY API

Provides access to open, industry-standard REST APIs to enhance Blackbaud solutions

SKY UX

Delivers a user experience framework to create applications with a seamless user experience and a consistent, cohesive user interface

SKY ADD-INS

Enable developers to create contextual experiences in Blackbaud solutions that exhibit the same high fidelity of behavior, experience, and capability

STACHE

Is a SKY UX component library for technical documents that facilitates documentation consistent with Blackbaud's

In addition, the Blackbaud Partner Network provides a marketplace for customers to connect with third-party developers to find solutions that augment and extend Blackbaud functionality.

We provide external developers with access to most of the SKY Developer toolset so that they can use the same tools as Blackbaud developers to build, extend, and contribute to capabilities in Blackbaud SKY solutions. In turn, our customers can take advantage of this open ecosystem to access capabilities that complement their Blackbaud applications and make them more productive and successful in their missions.

"Ultimately, we want to enable a developer with a great idea to come in and participate and be an active contributor to the Blackbaud SKY developer community by building an application, publishing that application within our marketplace, and making that application available to the thousands and thousands of Blackbaud customers doing social good across the world," Lambert says. "It's a win-win for everyone, so we want to have a platform that represents that compelling story."

SKY API

SKY API provides access to open, industry-standard REST APIs built over Blackbaud SKY capabilities. This enables partners and other developers to augment and extend the functionality in Blackbaud SKY solutions with integrations, applications, and business intelligence.

For Blackbaud customers, SKY API provides a variety of options to extend the value of their Blackbaud SKY solutions. They can leverage pre-built apps in our partner marketplace, use SKY API to build integrations themselves, or engage with Blackbaud Professional Services, Blackbaud partners, or third parties to build integrations.

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API Reference

- Accounts Payable
- Communication Preference
- Constituent
- Fundraising
- General Ledger
- Gift
- Opportunity
- Payments
- School
- Statistical Unit
- Treasury

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API Reference

SKY API provides access to data and domain-level capabilities within Blackbaud solutions, using a consistent RESTful experience and common authentication mechanism.

Find in this list 🔍

Accounts Payable

This API is used to manage accounts payable, including vendors and invoices.

Communication Preference (Beta)

This API manages constituent communication preference information and related entities such as constituent consent.

Constituent

This API manages constituent information and related entities such as addresses, phones, emails, and notes.

Fundraising

This API manages information contained within the fundraising hierarchy and related entities such as campaigns, funds, and appeals.

General Ledger

This API is used to manage the general ledger, including accounts, projects, and journal entries.

Gift

This API manages gift information and related entities such as gift splits, gift fundraisers, and soft credits.

Opportunity

This API manages opportunity information and related entities such as opportunity fundraisers, opportunity attachments, and opportunity custom fields.

Payments (Beta)

This API enables users to accept and manage payments via Blackbaud Merchant Services.

The SKY API website provides technical documentation and tutorials to deliver a first-class developer experience.

We designed SKY API to address the need for systems to interface efficiently, and it supports data-level integrations between applications. This allows external developers to integrate with our application experience and embed rich interactive content within Blackbaud SKY solutions.

SKY API uses a standard open architecture and provides a best-in-class developer experience. We design API endpoints for straightforward yet powerful development, and our API management layer ensures security and performance. SKY API provides a modern Developer Portal and a community with documentation and tutorials.

"The SKY API Developer Portal, powered by the Azure API Management product, is excellent and probably the best portal I've ever seen in terms of how carefully it was built out."

—Vlad Vinogradsky, Principal Product Manager, Microsoft

The developer experience includes technical documentation, a developer profile to manage subscriptions, an API Console to explore and test endpoints, analytics with metrics on API usage, registration and management options for applications, a developer community, user authorization to access Blackbaud data, and code samples to accelerate development.

Blackbaud customers seeking to extend the functionality of their solutions also benefit from the standardization of the SKY API Developer Portal. "Since it's an industry-standard REST API with clear documentation, we can now speak confidently to stakeholders about integration options, timing, and budget," says James Truxon of the Corning Museum of Glass.

SKY API emphasizes modern and contemporary technology with standards-based REST APIs and authentication protocols. It provides predictable, resource-oriented URLs and HTTP response codes for

API errors. This allows developers to interact with SKY API using browsers and virtually any HTTP client in any programming language.

"Because we are building on these standards, as opposed to inventing our own standards, SKY API plugs nicely into other platforms that are able to speak this standard language," Lambert says. "For example, we can connect with Microsoft Flow, Power BI, and Logic apps. With things like Power BI connectors and the Alexa Skill SDK platform, it's been very natural and easy to plug SKY API capabilities into those systems because we build on standards like REST and JSON and OAuth."

SKY API's open, standard authentication protocol and familiar verbs can be understood by off-the-shelf HTTP clients, and all API responses return JSON, including errors. The Developer Portal enables users to test API calls, and it provides code samples in a variety of languages. Authorization is token-based and built on OAuth 2.0. The client application must send a request header with a valid OAuth 2.0 access token to prove that a user granted permission. The access token represents an authorization that Blackbaud issues to the client application in the form of a JSON web token.

Our goal is for SKY API to span the breadth and the depth of Blackbaud's comprehensive solutions for social good organizations. We already have multiple APIs, with several publicly visible and even more in development. It will take time to represent all Blackbaud SKY capabilities in APIs, so we are taking a pragmatic approach and tackling the most requested items first to maximize the potential customer impact. Eventually, we expect all Blackbaud capabilities to be represented in SKY API.

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—Ben Lambert, Laureate Software Engineer, Blackbaud

SKY UX

The SKY UX framework incorporates Blackbaud's expertise as a user experience-centered organization into our solutions. It enables a consistent, cohesive experience in Blackbaud SKY solutions and allows third-party developers to provide that same user experience seamlessly in their own applications. The framework also provides guidelines and tooling for the entire application life cycle.

As an open source tool, SKY UX embodies the openness of Blackbaud SKY. It brings to life our commitment to flexible solutions and engages the open source community by participating as both a consumer and a contributor. Blackbaud provides SKY UX as an open source tool, and we also build it on open source tools and contribute back to those technologies.

"We rely on open source tools because of the community around them and the stability you get when you use the same tool chain as other global leaders," says Senior Principal Software Engineer Bobby Earl. "On the other side, almost everything is contributed back as open source except a few small pieces, mostly for security or scalability reasons. So we are consuming and contributing to the open source community. We contribute back to many of the libraries that

we consume. It's the same process that we ask our contributors to follow."

We contribute to many of the open source projects that we consume, and those contributions range from bug fixes and documentation to entirely new functionality. And because SKY UX is part of the open source ecosystem, third-party developers can use the same toolset as Blackbaud developers to build solutions and then turn around and contribute back to SKY UX.

"Consumers of SKY UX benefit because they literally use the same tools that we use."

—Bobby Earl, Senior Principal Software Engineer, Blackbaud

At its heart, SKY UX is the manifestation of Blackbaud's design philosophy. The HTML, CSS, and JavaScript framework implements Blackbaud design patterns and provides guidance on how to handle visual design and interaction patterns. The design patterns underpin the entire framework, and their creation is a labor-intensive process. We invest significant time and effort on research and testing, including client on-sites, client feedback, community feedback, and a variety of other mechanisms.
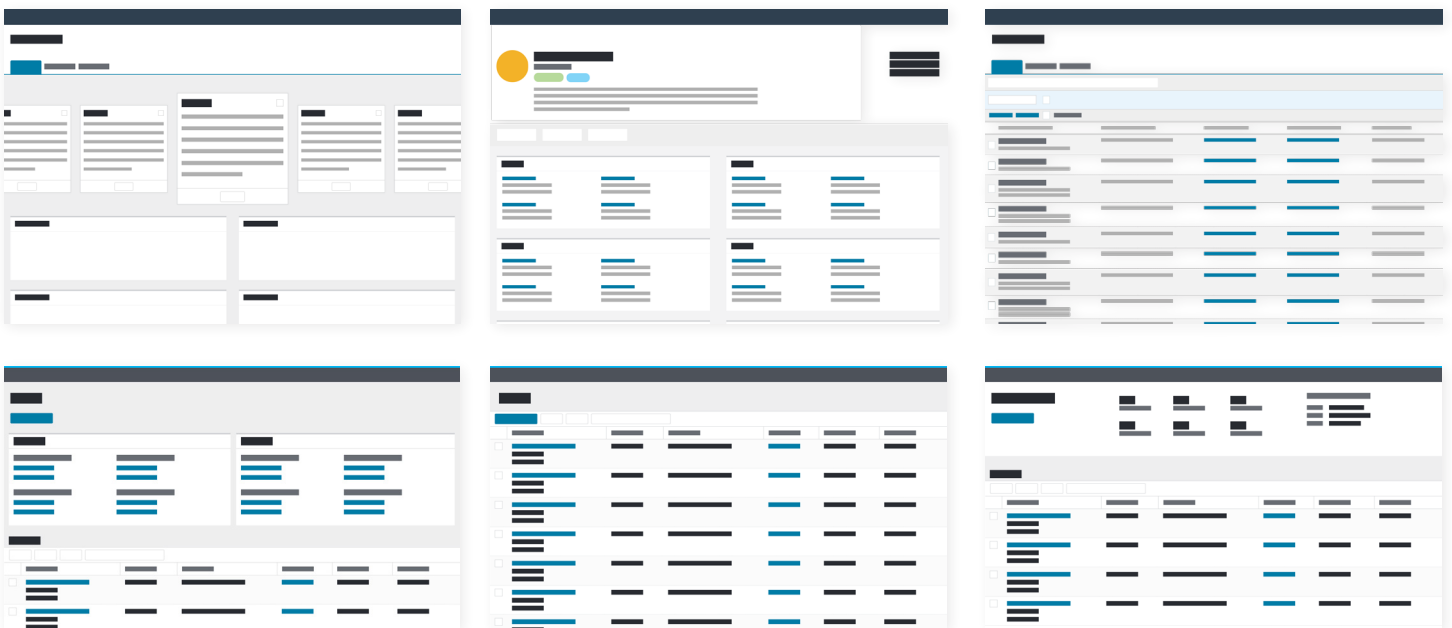
SKY UX patterns provide a cohesive experience across capabilities.

"We have an accepted pattern and philosophy for the interactions that should be available in our web applications, and we spend a lot of time vetting that philosophy before we move into an implementation," Lambert says. "All those philosophies are baked into this representation of how we expect our applications to look, and SKY UX is the implementation and the means by which we wrap up that logic into something that folks can actually consume—whether that's us or third parties."

SKY UX implements design patterns through an Angular component library and also takes advantage of Angular to provide tooling, testing, and performance. The choice of Angular for our component library was a business and technical decision to use the "paved road" that Angular provides. Angular is a popular client framework, and we chose to invest in that stack, train on it, and build a community around it. However, SKY UX is extensible, so developers can always opt out of our paved road and build components on a different framework.

The SKY UX team closely monitors the Angular team's thought process and philosophy, paying close attention to how they constantly iterate and factor their work. In addition to Angular, SKY UX components also rely heavily on other open source tools such as Sass, NPM, Travis CI, .NET Core, and GitHub.

GitHub

SKY UX is an open source tool that embodies the openness of Blackbaud SKY.

We set a high bar for components in the first version of SKY UX, and as we expand SKY UX capabilities in subsequent versions, that high bar is ingrained in everything we do. Starting with the second version of SKY UX, we extended the functionality to include tooling in the form of SDK and CLI libraries and to provide the capability to build and publish single-page applications (SPAs) as part of a platform that both internal and external developers can consume. This makes SKY UX more cohesive and increases its efficiency from start to finish. End users benefit from SKY UX's high standards regardless of whether they are using out-of-the-box components or creating SPAs with the SKY UX SDK.

For the build phase of development, SKY UX Builder serves as a cross-platform, command line developer tool to create, test, and run SPAs. It also builds output for SKY UX SPAs and handles configuration details. This provides a rapid development process with minimal setup for developers to create SPAs.

SKY UX Builder abstracts most of the tedious complexities of modern web development, including bundling configuration, unit test configuration, and routing/module configuration. This allows developers to focus on features, not infrastructure. The SKY UX CLI provides a command line interface for SKY UX Builder, and our CLI relies on Node.js as its tool chain. We don't use Node.js as a backend server, but it supplies critical tooling for our CLI.

SKY Add-ins

SKY Add-ins extend the Blackbaud user experience by embedding externally developed UI components such as tiles within Blackbaud solutions. External developers use the same tools as Blackbaud developers to insert content within Blackbaud's native applications.

"SKY Add-ins allow a developer to augment and enhance out-of-the-box capabilities with something custom that is built and owned and deployed by that developer," Lambert says.

"Our goal with add-ins is to enable contextually bound experiences within Blackbaud solutions that exhibit

the same high fidelity of behavior and experience and capability as Blackbaud's native solutions. We want to make it possible for developers to plug their offerings into this ecosystem and be as well received as anything that Blackbaud builds natively out of the box. And we want to allow this extensibility in a way that protects the integrity of our offering and does not sacrifice Blackbaud's ability to iterate and innovate."

We designed SKY Add-ins as web applications, so they are capable of almost anything that is possible in standard web applications. Blackbaud doesn't mandate a particular technology, so developers can use familiar web development technologies such as HTML, CSS, and JavaScript.

We promote and encourage SKY UX as an implementation detail to make add-ins aesthetically consistent with the rest of the system. But if developers prefer a different technology, we don't prohibit that. Add-ins are standard web applications, so developers can choose any framework, technology stack, or libraries that they want, including ASP.NET, PHP, Node.js, MVC, Angular, and React. These technologies are all valid choices for add-ins, and this flexibility benefits both external developers and end users.

Add-ins provide a superior user experience regardless of the platform, browser, or device. And when users switch devices, such as from desktops to phones, they get the exact same experience except that it is scoped and responsive to the form factor of the devices.

"Our goal with add-ins is to enable contextually bound experiences within Blackbaud solutions that exhibit the same high fidelity of behavior and experience and capability as Blackbaud's native solutions."

—Ben Lambert, Laureate Software Engineer, Blackbaud

In addition, add-ins facilitate easy deployment and integrate with third-party systems through single sign-on. Developers deploy add-ins to their cloud, and they control how and when to deploy them. To enable the single-sign-on experience, add-ins can obtain user identity tokens from the host application to securely correlate Blackbaud users with user accounts in the add-in's native system.

"One of the benefits of the way we've implemented add-ins is that we are able to achieve a cross-platform, cross-browser, and even cross-device experience, including single sign-on," Lambert says. "So that means whether you are using a Mac or a PC, whether you are using Edge or Chrome or Safari, and whether you're running our software on your desktop or PC or tablet, SKY Add-ins are a write-once, run-anywhere implementation."

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Developers create add-ins as web applications and ultimately build, test, deploy, own, and manage them on their own timeframe. They can deploy add-ins to whatever cloud they prefer, and they don't need to engage with Blackbaud because they build and run their own software. Add-ins integrate so well with Blackbaud offerings that customers don't even notice the difference between native functionality and the add-ins that external developers build, deploy, and iterate on.
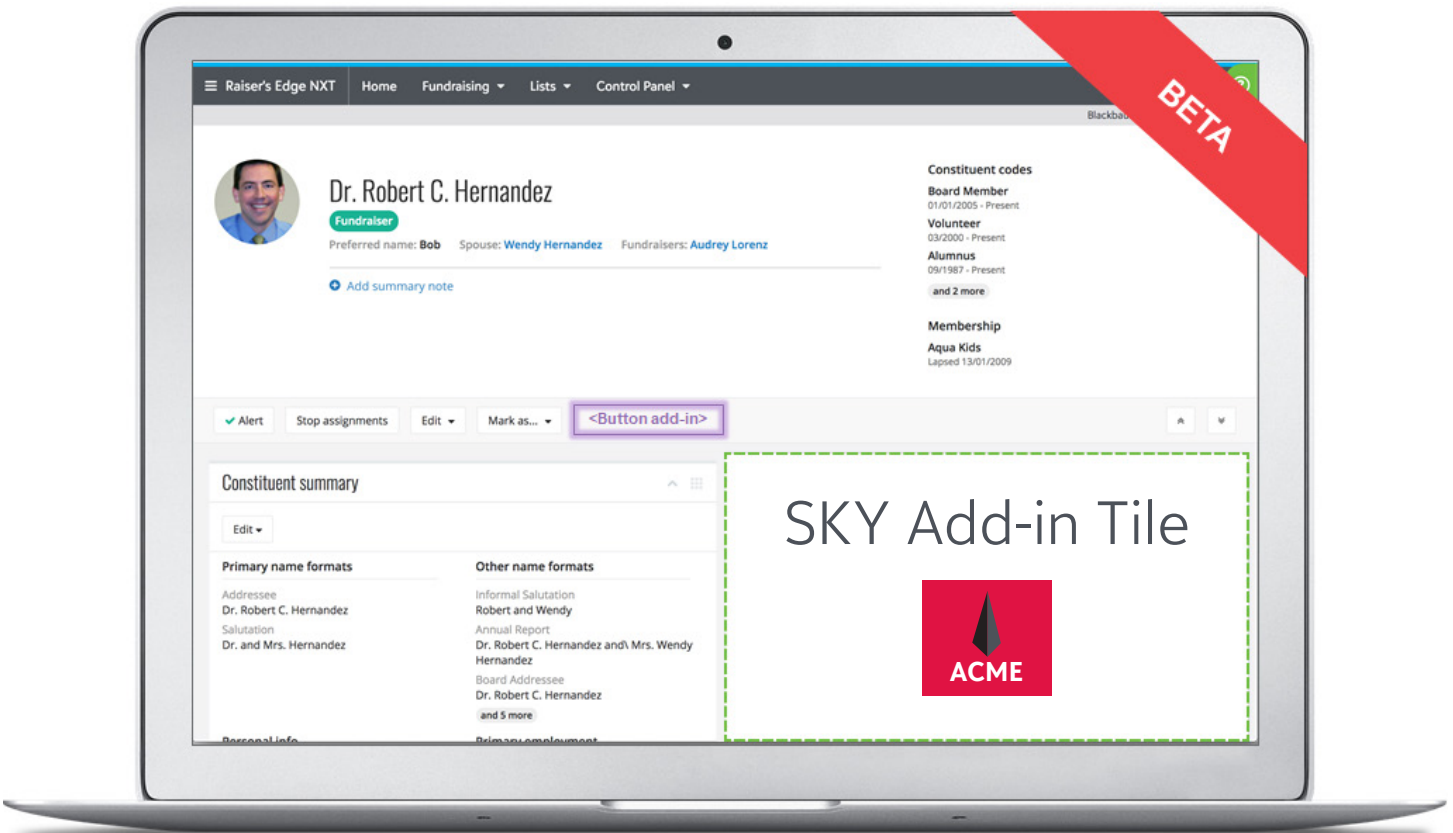
SKY Add-ins enable developers to build features that integrate with Blackbaud solutions.

Docs as Code

To enable the creation of well-designed technical documentation websites with a consistent user experience and strong information architecture, we created Stache. Stache is an open source component library built on SKY UX that allows users to write technical documentation with the same tools that they use to write code. Stache enables users to quickly produce technical documentation that is accessible from anywhere on any device.

As part of SKY Developer's open source ecosystem, anyone can leverage Stache, so customers and partners can create documentation SPAs using the same tools and techniques as Blackbaud. This enables customers to create technical documentation with the same look and feel as Blackbaud's documentation on sites such as SKY API and SKY UX.

Stache facilitates the creation of consistent, user-focused technical documentation sites using the same tools that developers use to write code.

Partner Network

The Blackbaud Partner Network brings together leading technology and service firms to provide the social good community with solutions, applications, and strategies that complement Blackbaud solutions and help social good organizations make a difference in their local communities and worldwide.

Our Partner Network helps social good organizations find technology partners who can provide applications and solutions that extend their Blackbaud solutions in ways that are tailored specifically to their needs. It also enables third-party developers to tap into a base of tens of thousands of potential customers for applications that integrate with Blackbaud solutions.

For Blackbaud SKY, the Partner Network provides a marketplace for applications built using the SKY Developer toolset. Customers can find new capabilities created by technology partners to extend and augment their Blackbaud solutions.

The guiding principle for the Blackbaud Partner Network is to serve as a marketplace of applications that enable the work of the social good community. Blackbaud enables external developers to create applications that extend our functionality, and we provide customers with access to that pool of developers and their innovations. And by highlighting approved applications built with the SKY Developer, we facilitate users in their search for applications that will help them achieve their goals.

Blog Posts

Changes To School API

As of May 8, 2019 we've added new endpoints to the School API . See our Changelog entry for more information.

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Posted by Bryna Gleich on 05/09/2019 12:04 PM

Changes To The Accounts Payable API

The Accounts Payable API was updated on 04/22/2019 to add the new Credit memo (PATCH) endpoint . See our Changelog entries for more information.

MORE

Posted by Betsy Unger on 04/22/2019 03:54 PM

Changes To The Fundraising API

The Fundraising API was updated on 04/19/2019. See our Changelog entries for more information. We added a fund_id parameter to the Fund list (Get) endpoint. The optional parameter, which can be specified multiple times to imply a logical OR, filters the results to only include information about specific funds. We increased the maximum record ...

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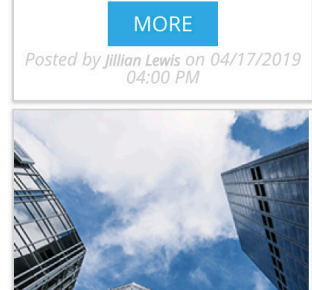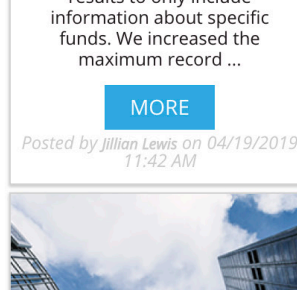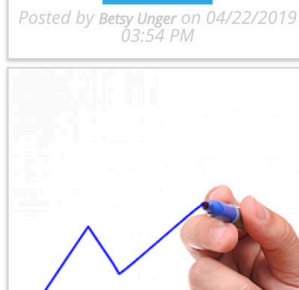*Posted by Jillian Lewis on 04/19/2019 11:42 AM*

Changes To The Opportunity API

The Opportunity API was updated on 4/17/2019. See our Changelog for more information. We increased the maximum record limit to 5000 on the Opportunity list (Get) endpoint. Previously, the limit parameter returned a maximum of 500 records.

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Posted by Jillian Lewis on 04/17/2019 04:00 PM

The SKY API Community keeps developers up to date and enables them to work together.

In Summary

SKY Developer provides a complete framework to create and deploy self-contained services so that developers can code for good, and the Partner Network provides a marketplace where customers can find applications that extend Blackbaud solutions to make them even more productive and successful in their missions.

Ultimately, SKY Developer means Blackbaud customers benefit not just from the innovation of Blackbaud's own large team of developers but also from an exponentially larger community of partners and third-party developers.

About Blackbaud
Leading uniquely at the intersection point of technology and social good, Blackbaud connects and empowers organizations to increase their impact through cloud software, services, expertise, and data intelligence. We serve the entire social good community, which includes nonprofits, foundations, companies, education institutions, healthcare organizations, and the individual change agents who support them.