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Engine

Tools to Compete

Lower Costs, More Resources, and the Symbiosis of the Tech Ecosystem



A Report By
Engine and CCIA Research Center

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Introduction

The startup ecosystem is an interdependent system of startups, support organizations, investors, service providers, and others working to support startup growth and success through the provision of guidance, capital, and other critical resources. Each of these components is critical to the success of individual startup ecosystems all across the country and the growth of the overall U.S. startup ecosystem.

Advancements in how startups build their companies—through the services provided by other startups and technology companies—have played an outside role in this success. Startups no longer need to build every basic part of their business and instead can focus on developing their innovative ideas. Startups rely on dozens of services and tools—many times for free or at low-cost—to perform those basic business functions, like payment processing, web hosting, or customer service. These tools help startups compete and have reduced the cost of launching a startup by at least three orders of magnitude in just the past two decades.¹

Research from the Computer & Communications Industry Association (CCIA) Research Center and NERA Economic Consulting has demonstrated the value of these services for startups and small businesses, and underscored the threats of legislation to their availability and price. Startups could face increased costs as customers of the companies covered by the legislation because the legislation may increase costs for covered companies and limit covered companies’ ability to offer free and valued services to startups.² Those incremental costs to startups could amount to \$3,000 per employee per year, according to the research.³

Moreover, regulatory compliance–induced cost increases disproportionately harm startups more than other businesses because they are small, have limited funds, and often don’t yet have positive free cash flow. As a result, startups have less room to maneuver in response to cost increases than established firms. In addition, regulation-induced cost increases for key tools create barriers to entry for new startups, as a startup needs more funding sooner in order to pay for such tools and bring its product to market.

In this report, Engine and CCIA seek to unpack the tools that startups are using to build, launch, and scale their companies. Through a survey of startup founders and startup support organizations, and reviewing the tech stacks of a sample of companies in Engine’s network, we outline the services startups are using and their impact on the ecosystem. For startups, this report provides a helpful cheat sheet to the tech tools available (often for free or reduced prices) by laying out the tools other startups are leveraging to build and compete. For policymakers, this report demonstrates the interconnected, interdependent nature of the startup ecosystem, and underscores how policy changes can reverberate through the ecosystem even if they don’t directly cover startups.



Methodology

To understand the tech tools that startups are using, we conducted two surveys—one of startups, and one of startup support organizations, like incubators, accelerators, and coworking spaces—and conducted our own review of the tools used by a robust sample of startups in Engine’s network. For ease and clarity, the resulting data is presented in aggregate unless otherwise noted. The research identified categories of services used by startups as well as examples of services in those categories. The examples used by startups are relayed for helpful context, but are not exhaustive, and may additionally overlap categories, even if only listed once.

Startup survey respondents are companies 3-14 years old, seed to series B-stage, with headcounts ranging from fewer than five to as many as 100 employees, located across the U.S., and operate in a range of industry subsectors—from education, to finance, to health. Some of the companies offer enterprise services and are themselves part of the tech stacks of other startups and organizations.

Startup support organization survey respondents are located throughout the country, serving between 50 and 3,000 startup entrepreneurs annually.

Sampled startups from Engine’s network operate in nearly every industry subsector and are located throughout the U.S. The companies sampled are as young as one year, pre-seed, bootstrapped, with no employees outside of the founders, and as old as 10 years, with over a hundred employees and tens of millions raised across several venture rounds. To review the tech stack of the sampled companies, we combine our existing knowledge of the companies with insights from the Internet technology intelligence service BuiltWith.

Overview

Startups leverage dozens of technology services and tools to build and run their companies—often for free or low-cost. And their use is ubiquitous—100% of surveyed startups utilize three or more tools. For sampled startups, 98% use five or more. But these are not necessarily the same tools; startups assemble the tech stack that works for them. Still, several companies use similar basic infrastructure. The three most popular categories of services used by startups are cloud hosting and computing services, like AWS, Azure, Google Cloud, or others; code repositories like GitHub or others; and communication and collaboration tools like those offered by the Google Suite, Slack, Microsoft, Zoom, or others.

“There’s a rich ecosystem of tools that act as building blocks so you can launch and build faster, and it’s so much richer than even 10 years ago.”

~Founder of enterprise services startup

These tools enable startups to launch faster and focus more of their limited resources on developing their innovative ideas. That’s critical for helping startups to compete, because they have more time and money to spend on what differentiates them in the marketplace, rather than rebuilding infrastructure that already exists. In fact, “these tools and resources are the only way you can launch efficiently,” and that you “have to use” for success, according to one founder, because “you can’t afford to run slow or expensive in any business, let alone a startup.”

Most startups launch with very little capital—usually with the founders’ personal savings until formal funding opportunities that come later.⁴ Companies in the tech stack used by startups know this and offer their services at a discount or for free to startups—sometimes depending on their size or how they’ve been backed. In this way, startups are the beneficiaries of what is known as “price discrimination”—when companies tailor their prices to customers’ ability to pay. By doing so, companies hope that startups will be successful and become long-time customers in the future.

These cost savings are critical for startups and lower barriers to entrepreneurship. Innovations in the infrastructure to build companies has brought the cost of starting a company to below \$5,000, down from \$5 million in 2000.⁵ And a serial entrepreneur in Engine’s network relayed that the costs of

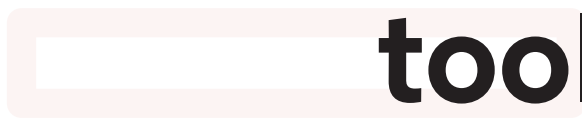
launching a startup have come down from the tens of thousands when he started his first company to just a few thousand when he started his latest company. This reduction in cost helps more people, from more backgrounds, in more parts of the country to pursue technology entrepreneurship.

“As a startup, you have limited resources. It would be impossible for one startup to build every single system from scratch. [...] It’s much more efficient—from both a time and financial perspective—to take advantage of products that are already available in the market and focus on building the pieces of your platform that will provide you with your competitive advantage. For us, that is the automation in routing we are building. That’s how we are able to provide affordable prices to the client, but at the same time, make the work so efficient that the drivers can get paid three times more than working for any other delivery apps. [...] Plus, many companies offer special pricing for startups for a certain period of time, which is really helpful to reduce expenses and keep our cash that we can invest in what will provide our customers with the best product. We also get credits, as a startup, from companies like Airtable—that’s how we build our product—and Google ads that help us to get our first customers. All of the programs like these have been very helpful to our work and were important to getting us to where we are today.”⁶

~Joshe Ordonez, Founder & CEO, Airpals – Brooklyn, New York



The Startup Stack:



**What are
the services,
tools, and
resources
startups use?**



Web Hosting

Usage: **100%**

STARTUP STACK

As startups are Internet-based, largely software companies—and almost always companies with a software component—it makes sense that 100% of companies captured here use web hosting services. This speaks to the reduction in barriers to launching startups brought by the cloud. No startups are building their own hosting infrastructure. Instead they can leverage one of several services and can usually get started for free. With AWS free tier, for example, companies can host their sites for a year at no cost. Most of these services offer free service levels or free trial periods. Even paid hosting services for most sites are available at very low cost.

AWS

Hubspot

Flywheel

Google Cloud

Fastly

Unified Layer

Digital Ocean

Cloudflare

JustHost

Microsoft Azure

Atlassian Cloud

OVHCloud



“There’s no way we would be where we are without the ability to use [cloud] service[s]. We would have had to spend years just to build the hardware infrastructure to host our product. AWS, Google Cloud, and Azure-type services are what allow so many tech startups to flourish and build cool things without having to worry about the hardware and infrastructure.”⁷

Patrick Utz
Co-Founder & CEO, Abstract
Sacramento, California



Code Repositories, Open Source and Developer Support

Usage: **93%**

STARTUP STACK

Code repositories provide a place to host source code, and enable startups to collaborate and develop their software. Startups also pull open source from code repositories and other places to build and innovate on top of. And many code repositories have community platforms that startups and their teams can use to find solutions to common problems or get input from a wider developer community. Most code repositories and developer support tools are free for startups to use, ensuring that startups can collaborate freely. Several also offer additional paid features, which qualifying startups can receive for free or discounted prices.

GitHub

cdnjs

Bitbucket

React

Stackoverflow

LaunchPad

Polyfill.io

GitLab



Productivity, Collaboration and Communications Tools

Usage: **93%**

STARTUP STACK

Startups are nimble by nature and use several tools to communicate and collaborate with their teams and others as they build their products. Some startups even build initial versions of their product or the backend of their product in these tools, which are often available to startups for free for the basic versions and at low cost for business versions.

Calendly

Office 365

Loom

G Suite

Skype

Slack

Zoom

“Almost all of our content is written in, and then made available through, Google Docs. This works well for us. We’ve found that as a team it’s easier for us to draft, comment, and finish content.”⁸

Max Tendero

Co-Founder & CEO, Civil

Ada, Michigan



HR, Payroll and Accounting Tools

Usage: **92%**

STARTUP STACK

Startup founders want to focus their time on running their businesses and building their core products, not administrative tasks. It's no surprise that 92% of startups leverage business software and services to help them do that by automating or streamlining payroll and accounting processes. Some small startups are merely the founders themselves and may not need payroll services, but they might still use tax preparation software to ease tax compliance. Larger startups might be in a position where they'd like to offer their employees benefits but aren't positioned to arrange or negotiate those offerings themselves. Instead, many utilize what is known as a professional employer organization to streamline and handle benefits, payroll, and other HR functions for them and their employees.

Quickbooks

Gusto

Turbotax for Business

Professional Employer Organizations like TriNet

*"I knew when starting BadVR that I wanted to be a remote employer. I think that remote work is great, but going through the process of having employees in different states is really complicated. We use a third-party HR administrative service, which helps us with paperwork that needs to be filed."*⁹

Suzanne Borders

Founder & CEO, BadVR
Manhattan Beach, California



Website Builders

Usage: **90%**

STARTUP STACK

Website builders make it easy for startups to quickly create attractive interfaces to interact with their customers at low or no cost, often without the need for coding knowledge. Not only do website building tools lower cost barriers, they also dramatically reduce the technical knowledge needed to initially get off the ground.

WordPress	Webflow	Ghost
Hubspot	Fastly	Netlify
Squarespace	Elementor	Aloa
Wix	Unstack	



Legal and Compliance

Usage: **86%**

STARTUP STACK

Startups turn to legal and compliance tools because they can help lower cost compared to the analog alternatives, even when primarily used to streamline basic business functions. For example, some startups use Termly to create their terms of service rather than consulting an attorney to write them. And some startups use various compliance tools to ease burdens of compliance with e.g., privacy regulations. These tools can be more accessible and cost efficient than specialized consultants or attorneys that larger companies use, but compliance and RegTech tools can still be expensive for startups. In this way, many of these tools are helpful but not a panacea, and policymakers still need to be wary of imposing onerous regulatory requirements on low-resource entities like startups.

DocuSign	Drata	Silktide
Termly	Osana	TCF v2.0



Marketing and Digital Advertising

Usage: **85%**

STARTUP STACK

Startups utilize dozens of services to find, engage, and communicate with their customers and potential customers—from digital advertising infrastructure to social media to email to chat widgets and beyond. Startups also sell advertising space on their sites to generate revenue, enabling startups to offer their services to their users for free. The sheer volume of tools used for these functions demonstrates their importance to startups.

Advertising Tools:

Google Ads	LinkedIn	Wistia	Rapleaf	Simpli.fi	Pubmatic
Google AdSense	InMail	Hubspot	Zoominfo	Viglink	Criteo
DoubleClick	TikTok	Hotjar	Fullstory	BlueKai	Amplitude
Facebook	Toutiao	Yoast	Heap	Tapad	Segment
Instagram	Reddit	OwnerIQ	Lucky Orange	Eyeota	
Twitter	Youtube	LiveRamp	Shareaholic	Gumgum	

Customer Service, Experience, and Engagement tools:

HelpScout	Rocket Chat	Mailgun	Mailchimp	Pabbly	Google Forms
UserVoice	Freshdesk	Mailtrack	Facebook	Pipedrive	ortto
MailJet	Tidio	Livechat	Whatsapp	Trustpilot	Algolia
Emma Inc.	Drift	Mandrill	Intercom	Yelp	
Zoho Mail	Salesforce	Flodesk	sendgrid	Google Reviews	
Zendesk	Plumb5	goAffPro	Snov.io	Survey Monkey	



“We’re building our core technology from scratch—we have an amazing team of engineers that works hard to build a great platform—but we leverage integrations with other platforms to maximize value. [...] For example, if you need customer support technology, it’s much more efficient—from both a time and financial perspective—to take advantage of products that are already available in the market[. ...] Integrations with platforms like Intercom and Zendesk to get what we need out of our website are super helpful.”¹⁰

Joshe Ordóñez
 Founder & CEO, Airpals
 Brooklyn, New York



Hiring and Recruitment Tools

Usage: **84%**

STARTUP STACK

Startups need the best teams to help them grow and build the best products for their customers. Many startups use hiring and recruitment tools to help them find the right people—some general, some specific to the startup ecosystem. Many startups also leverage their local incubator or accelerator to help with hiring and recruitment of critical early talent.

LinkedIn	Angellist Talent	Hireology
Indeed	Lever	
Glassdoor	Greenhouse	



Cybersecurity

Usage: **79%**

STARTUP STACK

While most of the hosting and other cloud services that startups rely upon come with security features built in, startups identified other services they use above and beyond those standard mechanisms. Several startups, for example, utilize two-factor authentication plugins or CAPTCHAs to avoid malicious actors and spam.

Cloudflare	reCAPTCHA	Drata
2FA	Let'sEncrypt	



Cloud Computing and Database Services

Usage: **69%**

STARTUP STACK

Cloud computing services have lowered barriers for startups by enabling them to innovate without needing to worry about building the hardware physical infrastructure themselves. Cloud companies offer services and solutions across several of the categories here—from hosting to computing to security tools to marketplaces, which can ease and streamline startup development. And collaboration and database services like Airtable are low-code—lowering the technical skill needed to build innovative products.

- AWS
- MongoDB
- IBM
- Airtable
- Azure
- Google Cloud
- Oracle



“We’re using MongoDB Atlas as a service for the database [...] Instead of using one of the many other services out there, we went with MongoDB because it allows us to be more flexible from the product perspective, and lets us move from different servers as long as we use MongoDB as a database. So it has helped streamline costs quite a bit.”¹¹

Max Echeverria
 Founder & CEO, Eskuad
 Portland, Maine



Payment Facilitation and Processing Tools

Usage: **57%**

STARTUP STACK

Less than two decades ago financial technology enabling commerce over the Internet was nascent and little trusted. Today, startups can leverage one (or more) of several services to facilitate sales and process transactions best suited to their product offering and customer base.

Stripe	Venmo	LaunchPass
Square	PayPal	Click and Pledge
Mercury	ApplePay	Thrinacia
ShopPay	Pabbly	

“It used to take months to get a merchant account and get payments set up. Now it’s simple with a combo of Mercury and Stripe.”

Founder of enterprise services startup





Platforms and Marketplaces

Usage: **56%**

STARTUP STACK

Startups use platforms, marketplaces, and app stores across dozens of mediums to reach customers and deliver their products. While startups drive people to find their apps, plugins or storefronts, these platforms also enable potential customers to discover startups as well. Marketplaces and app stores help to increase user trust, especially for startups that generally have little name recognition. And depending on how they are structured, certain marketplaces, like the AWS Marketplace, for example, can help startups to access dedicated procurement resources of governments and enterprises, shorten timelines, and reduce transaction costs.

Google Play Store	Shopify App Store	Buzzsprout
Apple App Store	Shopify	Magic Leap World
Chrome Web Store	wooCommerce	Amazon
AWS Marketplace	Wix eCommerce	Kickstarter
FedRAMP	Kajabi	



Funding, Workshops, and Incubators

Usage: **20%**

STARTUP STACK

To be sure, startups attend dozens of workshops, earn funding from many sources, and are incubated in many places, but these are the handful from for-profit companies that startups told us about. These programs vary, but each generally provides companies with capital or credits (for example, Google for Startups Founders Funds give non-equity grants to companies, and AWS Activate gives startups up to \$100,000 in AWS credits, depending on how they've been backed), training, mentorship, and networking opportunities designed to give participants a boost and better position them for success.

Google for Startups

AWS EdStart

Google for Startups Latino Founders Fund

AWS GovTechStart

Google for Startups Black Founders Fund

AWS SmartCities Accelerator

AWS Activate

MongoDB for Startups



“We were [...] awarded a grant from the inaugural Google for Startups Latino Founders Fund. Our experience there was great—Google offers network building and founder-to-founder support.”¹²

Eric Alvarez

Founder & CEO, Grapefruit Health
Chicago, Illinois



Resources From Local Organizations—Accelerators, Incubators, and Coworking Spaces

Usage: **57%**

STARTUP STACK

Perhaps one of the most important resources for startups are the people and organizations that make up their local startup ecosystem. Accelerators, incubators, and coworking spaces are at the heart of that—offering numerous critical services to startups and founders—mentorship, training, networks, and funding opportunities. Their role in the ecosystem merits a report of its own and could not possibly be adequately captured here, but many also often offer group access to or discounts on several of the services highlighted throughout this report.

There are also nationwide companies that aggregate where to find free and low cost services, like Growth Supply’s “400 Awesome Free Tools & Resources for Entrepreneurs and Startups” or offer access to discounts, like joinsecret. And some of these companies, like joinsecret or Builtfirst provide their discount marketplace infrastructure to economic development organizations and startup support organizations to offer their communities.

Startup Spotlight



Sedale Turbovsky
Founder & CEO, OpenGrants
 Folsom, California

We founded OpenGrants to establish a single source for government funding and to increase accessibility, equity, and transparency in the public funding space. Public funding has historically been difficult to access, and companies—especially small businesses and startups—have found it really difficult to engage with agencies because they’re so big, and timelines might not work for them. And despite their best efforts, agencies have not had the tools or wherewithal to engage startups, nonprofits, and underrepresented groups in a meaningful way. The idea behind OpenGrants is not only to give startups, underrepresented groups, and nonprofits the tools they need to engage these agencies and quickly and efficiently locate opportunities, but to also give governments, agencies, and foundations the tools they need to efficiently and effectively engage those constituencies.

As part of our products for governments and other grant funders we offer a plugin on the AWS marketplace. The cloud marketplace offering was a strategic choice that has been really helpful for us from a government customer standpoint. For our government clients, AWS is a trusted provider where they already have established procurement channels—so it both adds legitimacy and streamlines the process from services delivery to billing to procurement, and beyond. The sales cycle with government organizations is typically pretty long, so it’s a great tool to help shorten that—with the AWS plugin we can get them set up and running in less than three months instead of six or a year.

For startups—depending on what they’re doing—cloud marketplaces can be strategic tools to leverage to deliver their products. There are a lot of marketplaces outside of AWS, and which ones companies use depends on who their target clients are. Those selling to the federal government might use FedRAMP, for example. It’s not a panacea and you still have to drive customers to find you in the marketplace, but cloud marketplaces can be a really good way to streamline processes and access organizations’ dedicated procurement resources.

Beyond channels for going to market, there are lots of great tools that companies can leverage as they launch and grow, available to them for free or at reduced prices. You can get everything you need to get started for very little, and that amounts to a huge reduction in barriers to entrepreneurship. The barrier for most people is capital, and these tools reduce the outlays of starting a business from roughly \$10,000 or \$20,000 not all that long ago, to about \$3,000 today. In addition to the individual companies offering special pricing for startups, there are many marketplaces, like Secret or BuiltFirst that aggregate them, and it’s so important for founders to know about. We’re working on building a convening solution as well. Moreover, policymakers should be aware of and support these sorts of critical tools entrepreneurs use.

About OpenGrants:

OpenGrants is a grant search engine that helps foundations, governments, and other organizations deploy capital and offer grant funding, and aids startups, nonprofits, and other organizations in accessing grant funding.



Implications For Public Policy

The vast array of tools, services, and resources that startups rely upon demonstrates the interconnectedness of the tech ecosystem and underscores how policy can impact startups even when they are not the targets of such policies or policy changes. These impacts are often unintended but lead to business disruptions and increased costs for startups and can be seen across a range of issues—from data privacy, to digital taxes, to competition policy, and beyond.

For example, consumer data privacy laws (which can and do impact startups directly) impact key services that startups rely upon to reach customers and generate revenue, like advertising services. Startups both sell ads space and leverage ads for customer acquisition—and even if not the stated intent of the laws, they can result in increased costs and decreased quality of those ads.¹³

Likewise, digital taxes that have been proposed in various jurisdictions in the U.S. and around the world can result in increased costs for startups, even though startups are rarely directly subject to the taxes themselves. This is because the ecosystem is connected through symbiotic relationships—startups are customers of the taxed firms, who have historically responded to such taxes by increasing prices for their services.¹⁴

And competition proposals aimed at large technology companies could impact their ability to offer many services used by startups for free or low-cost as they do at present. As CCIA has examined, the legislation could increase operating costs for digital service providers, resulting in startups and small businesses facing estimated cost increases of \$3000 per employee per year.¹⁵ That could amount to around 6-8% of a small, established startup’s budget,¹⁶ and would reverse the trend of ever-lowering barriers to entrepreneurship over the past decades.

Regulatory compliance–induced cost increases disproportionately harm startups more than other businesses because they are small, have limited funds, and often don’t yet have positive free cash flow. As a result, startups have less room to maneuver in response to cost increases than established firms.

To avoid harmful unintended consequences as they legislate in the technology sector, policymakers must keep in mind the interconnected and interdependent nature of the startup ecosystem.

Endnotes

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