



# WE'RE ALL SOFTWARE DEVELOPERS NOW

Why The Next Programmer  
Joining Your Company Is You

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kintone



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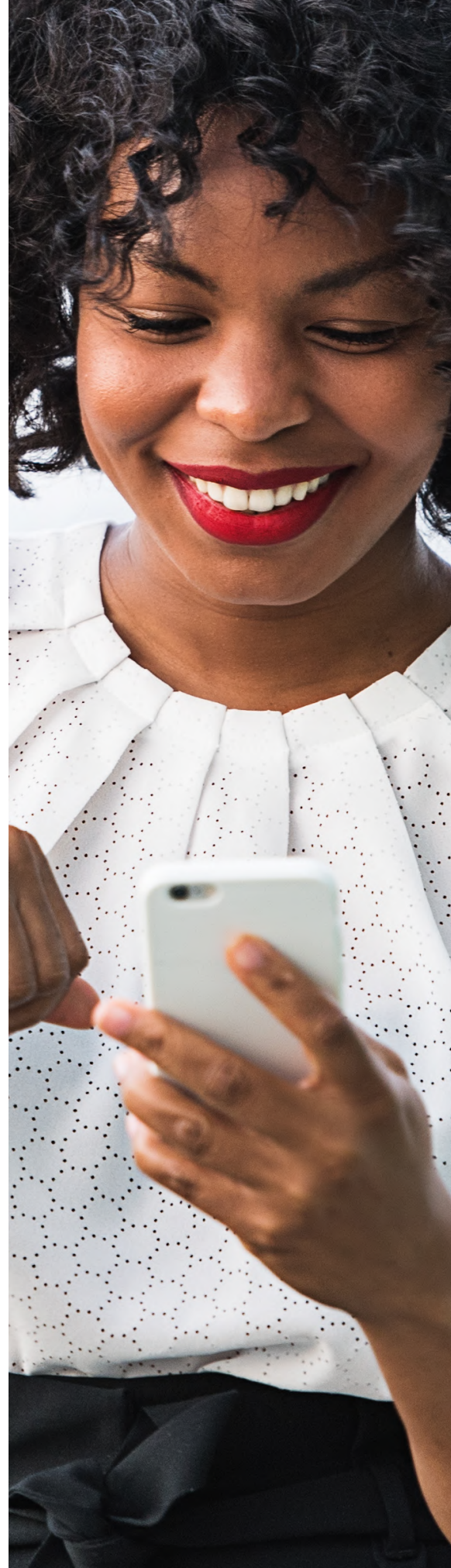
# ZERO.

## Technology Isn't Just Changing, It's Changing Us

**Times change. Technology advances. Work evolves. For most of us, these changes have been gradual.**

Maybe you bought an Alexa. Maybe you started storing files in the cloud. Maybe your office switched from hard drives to Google Drive. However mundane they may seem, these small changes aren't inconsequential—they're symptoms of massive technological shifts. And they're not slowing down. Regardless of how much attention you're paying—or how little it feels your life is changing—one fact remains: technology is central to the way we work. And if technology is changing, we have to change with it.

Luckily, reskilling for the new digital world of work isn't as painful as it's cut out to be. Turns out, you don't have to throw out your prior skills and toss yourself into a coding bootcamp. If you're into that stuff, then more power to you. But if you're not, there's a way to survive in a world consumed by software and automation while remaining exactly who you are, professionally speaking. In fact, being exactly who you are is going to be what makes you most valuable. You just have to adapt.





**“In the future, every company will become a software company.”**

*-Marc Andreessen, American Entrepreneur & Investor*

It's been said that in the near future, every company is going to become a software company. And that means every employee is going to have to become a software developer. “Adapting” doesn't mean just getting more comfortable with technology—it means rethinking your relationship with software.

For a long time, businesses have relied on programmers and other IT professionals to develop the software that helps us get things done. But as the demand of technological growth has increased, IT has struggled to keep up—and this isn't slowing down either. As IT demand continues to increase—and existing teams become increasingly challenged to meet it—the gap will only continue to grow.

So what does all this mean for you? It means you need to become part of the solution. This brief ebook will help you understand this game-changing shift—how we got here, why it matters, what it means for you—and how a new set of intuitive visual programming tools is transforming the future of work by putting the power to build software in anyone's hands.

# ONE.

## Why You Aren't a Programmer...Yet.

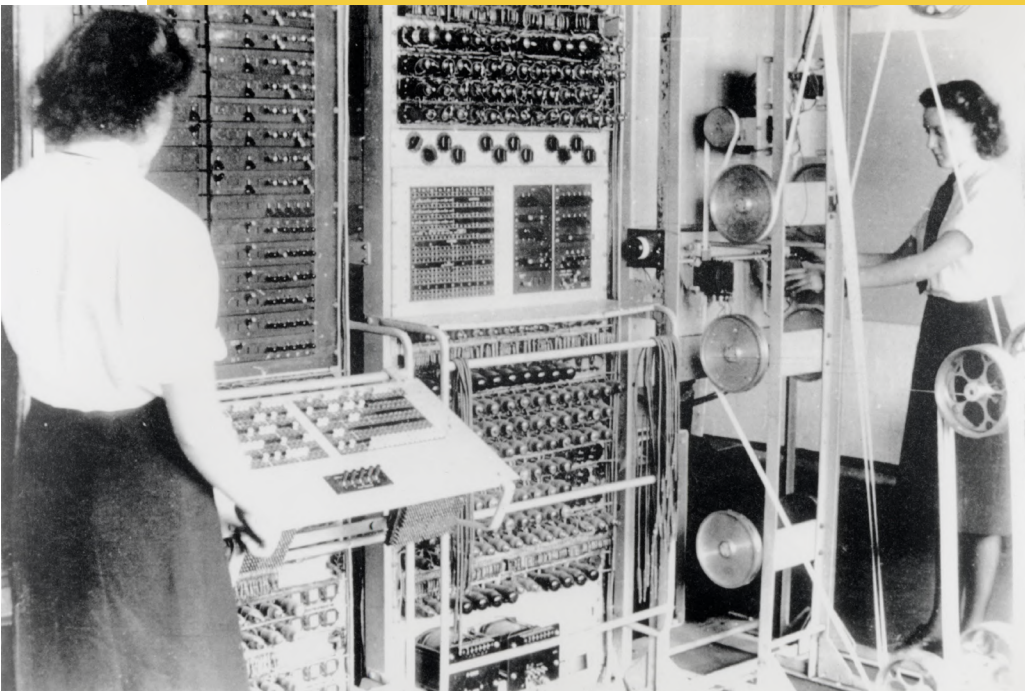
You may not know much about the early days of the computer aside from the basics. Computers were huge, there were just a few in existence, and only a handful of people were skilled enough to operate them. Programming looked very different than it does today. The main thing to understand is this: in the days of vacuum tubes and punch cards, we were certainly not all software developers.

What's interesting is that **the history of computer programming isn't just an indication of how far we've come—it's also an indication of where we're headed.** As computer technology has evolved, it has also become increasingly accessible. Room-sized computers gave way to build-it-yourself home kits, which eventually led to off-the-shelf personal computers in homes everywhere. But it's not just that more and more people gained access to computing technology—they

### **Innovation is Impacting Accessibility**

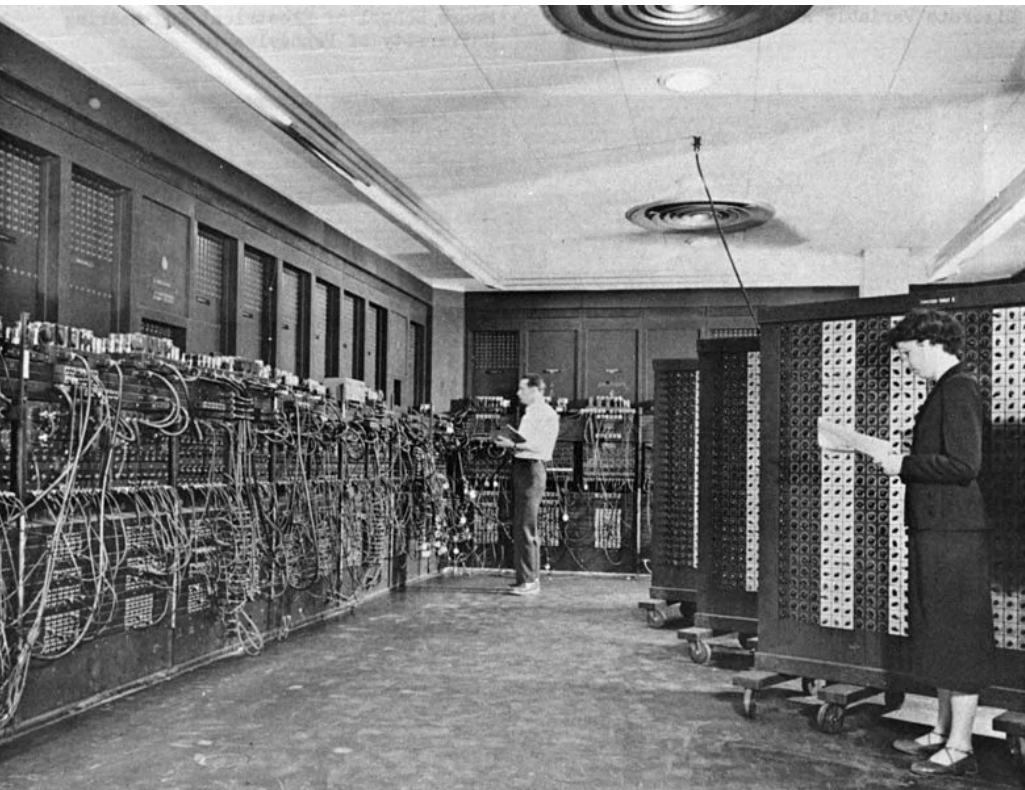
Innovation continues to make technology more and more accessible. In the early days of the computer, a single computer filled an entire room, and only a select few knew how to operate it.

Even the first personal computers for sale were extravagantly priced at \$750 back in 1971, which if adjusted for inflation is equal to \$4,659 today. Now, any non-engineer can not only purchase a computer for a few hundred dollars, but also slip it into their back pocket.



*(Top) The first electronic digital programmable machine was used by British codebreakers to decipher German cipher during World War II.*

*(Bottom) The ENIAC, completed in 1946, required 1,800 square feet of floor space and used over 18,000 vacuum tubes to operate.*



gained the ability to program it, too. Software development used to require extensive education and qualification, but each major technological innovation has broken down some of these barriers—so many barriers that at this point, they’ve almost disappeared entirely.

So, while you may not be a programmer yet, history has set you up to become one—just not in the same way as in the past. **The original vacuum tube programmers were mathematicians.**

Programming meant operating 1000+ various switches, plug panels, and circuits in order to solve linear equations. Punch card programmers could be mathematicians or engineers. They had to manually write their code on coding sheets, and then plug them into the computer using keypunches. There was no room for error, as a simple typing error would necessitate re-punching the entire card.

Today's textual programmers don't necessarily need to be mathematicians or engineers—many of them are just hobbyists.

**This slow but sure shift from exclusivity to inclusivity in the field of software development is the democratization of the industry in action—and it's happening faster than ever.**

Today, there are approximately 25 million programmers worldwide. You don't need the sophisticated education that the original vacuum tube programmers needed to do their jobs, and you don't even need the intensive training that today's programmers have. **While it's true that 25 million is a lot compared to the original handful of jobs, it's nothing compared to where we're headed next.** The latest major paradigm shift breaks down the last remaining barriers to access, and is bringing the ability to develop software to everyone. It's called visual programming.

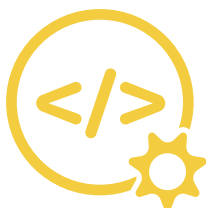


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# TWO.

## Why It's Time to Start Thinking of Yourself as a Programmer

The democratization of software development isn't just a cool perk of technological advancement. It's a necessity. As software increasingly takes over every industry, the demand for developers continues to grow. Software demand is outpacing the speed at which we are producing developers, and there's a widening gap between the supply and demand of digital skills. Despite the cute names the media gives it—ie. the developer drought, the programmer shortage, the battle for tech talent—this is a serious problem. **By 2020, there will be one million developer job listings and only 400,000 computer science graduates to fill them. That's one million unfilled developer jobs.**



*The average enterprise has 464 custom applications deployed today.*



*Business spend on software grew an average of 7% a year over the last 25 years.*



*In 2018, the average enterprise was projected to develop & deploy 37 new applications every year.*



**“By 2020, a third of successful attacks experienced by enterprises will be on their shadow IT resources.”**

*-Gartner’s Top 10 Security Predictions 2016*

There’s already a lack of IT resources available to the majority of our businesses, and whether we realize it or not, many of our teams are resorting to unsustainable off-the-shelf solutions—or “shadow IT apps.”

Shadow IT consists of any application, program, or system that a company builds or buys without IT oversight. It can be a monthly subscription to applications, like Slack or Dropbox, or department-specific apps like Salesforce or Zendesk.

Apps like these—or ones built in internally—are largely ungoverned, rarely officially approved by the company, and significantly increase technology spend.



## **What is Shadow IT Costing You?**

While Shadow IT may help increase productivity and problem-solving capabilities, it also comes with a higher risk of security and compliance complications because the tools are not properly vetted. *The Everest Group* found that **Shadow IT takes up an astounding 50% or more of overall IT spending for large enterprises.**

*Originally, Shadow IT referred to unauthorized Excel macros. Now, it includes items like USB drives, camera cards, and even many cloud-based services like Gmail & Dropbox.*

**While this may not be impacting you directly, Shadow IT accounts for 50% of IT spending in large enterprises.** And that’s a tremendous amount of money being drained—money that could be better directed elsewhere.

The majority of these apps aren't even making your job easier. In fact, they're making it more difficult—causing you to constantly toggle from multiple platforms, databases, and applications over the course of each day. Like many others, your business may not see any alternatives or a way out, so you eat the costs for these apps—apps that, in many cases, are wildly inefficient.

We all need software—now more than ever—but we have to face the reality that we're not going to get it from fresh graduates with computer science degrees. There just aren't enough to go around. We have to stop relying on programmers, and instead change our definition of who programmers are. **If you want to survive, it's time for you to become a programmer—or risk becoming about as relevant as a switchboard operator or pinsetter (the guy who sets up the pins in a bowling alley).** He didn't have the privilege of seeing what was coming, but you do. You might be scared about a machine taking over your job, but there is a way to change with the times. The technology is here. And it's here to meet you where you're at.



# THREE.

## Your Biggest Asset As a Programmer Isn't Writing Code

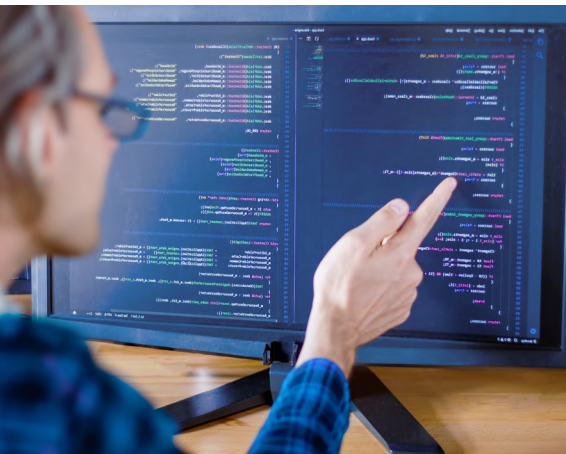
When you think of software development, you probably picture coding interfaces filled with lines of text. And unless you actually want to be a programmer, odds are diving into that Matrix-like world is the last thing you want to do. It's understandable: Coding programs require extensive education, skills-development, and practice. Many programmers argue that coding also requires completely rewriting the way you think—not merely acquiring skills, but also restructuring your brain to accommodate them.

**Luckily, change is happening on both sides of this equation: While you're being pushed to become more comfortable working with software, programming technology is changing to accommodate you where you are.**

That's the technological advancement and accessibility parallel again—and it's finally reaching you.



But this time, you don't need to learn an entirely new skill set. And contrary to what you may be hearing, your prior skills are actually really valuable. **The fact is, it's not knowledge of text editors that's going to make you an effective programmer, it's knowledge of your specific field.** Only you know what will make your job easier—and the knowledge you have about what would make your workflow faster and more effective is knowledge that no “regular” programmer has.



Think about it this way: you're not just gaining programming skills to help your company with random IT needs that it can't fill, you're gaining programming skills to help fill your own IT needs—to solve the problems that get in the way of you and your team's ability to do your jobs as efficiently and effectively as possible, every single day. Now, with the advent of visual programming, you have the capability to rebuild, restructure, and reorganize all of those processes yourself.

*(Top) A recent study found jobs of the future are becoming more multi-disciplinary. These “hybrid” jobs are often require wider set of skills from various fields, but as a result they are 20-40% higher paying than their traditional counterparts and mostly immune to automation.*

*(Bottom) Half of jobs in the top income quartile (>\$57,000 per year) are in professions that commonly require coding skills from job applicants. But while coding skills may be in high demand, the way in which code is written and delivered is currently undergoing a shift.*

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# FOUR.

## Believe It or Not, You Already Use Visual Programming Tools

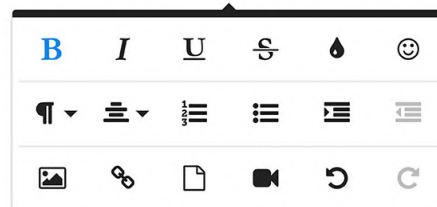
When every company becomes a software company, every employee will need to become a software developer. And visual programming is how that's going to happen. Even if you don't realize it, you've probably done some visual programming before. Visual programming tools don't fill your screen with lines of code text. Instead, the user interface is, as the name suggests, visual.

The act of programming consists of dragging and dropping graphics, just like you do in many of your favorite consumer websites, social media tools, and apps.

While WYSIWYG editors and similar tools are a form of visual programming, **in this case the technology is being reapplied.** You're no longer using those tools to add cute lines and colors to text—you're using them to build powerful, customizable databases and workflows optimized to meet your

*(Below) Inline editors are commonplace in the office; we often use them without thinking about their broader application to software development.*

Inline text editors, also called WYSIWYG editors, are *bite-sized visual interfaces* that allow users to **modify code-based elements like color and text alignment** without needing to code or interact with the text editor themselves.





*(Top) Build-it-yourself websites are a widely-recognized example of visual programming tools and code-free development.*

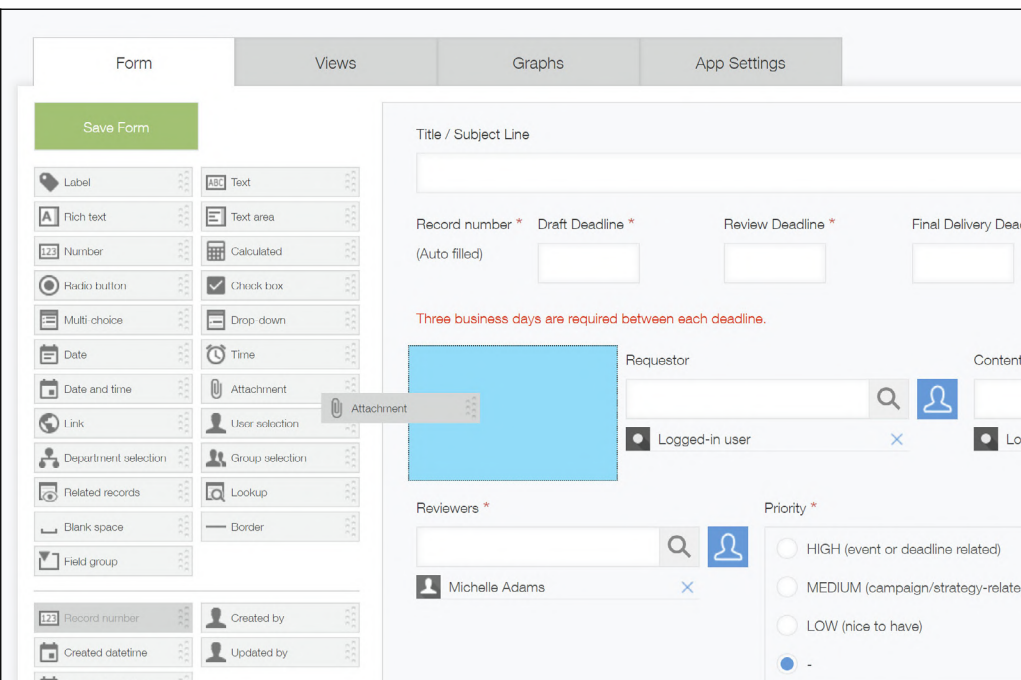
*(Bottom) Visual programming tools are designed to be widely accessible, meaning employees of all technical levels can use it.*

specific needs. And, you can start using them the second you're done building them.

By manipulating graphics with drag and drop features, you'll customize your own applications and build your own software displays. You'll build your own database tables, reports, and graphs to uniquely fit your business data. Visual programming won't just make your life easier, it'll make your work better. And it'll turn you into a software developer at the same time.

**Forrester estimates that visual programming methods can develop software up to 10 times faster than traditional methods, and that doesn't even take into account the sheer number of people who will be able to do it.** When you and your team begin to build and customize the technology that you need to get your jobs done, your entire company will run smoother, faster, and smarter. Your company will increase its software development throughput dramatically, and you'll cut the costs of Shadow IT apps. Your coworkers in IT will finally be able to catch up on backlogs—and they'll finally have lives.

The transition will be collaborative. Visual programming tools like Kintone's operate across one, completely integrated platform, so business data collection and communication across the company will become seamless.



*(Right) This screenshot of the Kintone application builder shows how individuals can quickly build enterprise applications specific to their needs without writing a line of code.*

# FIVE.

## Why Your Company Needs Your New Programming Skills To Survive

Visual programming gives you and everyone you work with a chance to fundamentally reimagine the way you do work—and the way you use technology to do it. You can design a system that works for your role, for your company, and for your field, rather than struggle within systems made by developers with no knowledge of your day-to-day tasks and responsibilities. For the first time in history, we're all getting the opportunity to create software from scratch, and optimize it to fit our jobs.

**Employees switch apps approximately 1,100 times a day when working.**

Many of the platforms that provide visual programming tools are fully integrated. This means you're no longer toggling between multiple apps and databases and spreadsheets every day. People talk about the inefficiency of traditional software solutions like email and spreadsheets—but when has there been a viable alternative? Now, you're able to build software that not only solves these problems, but bypasses them completely: Customizing, centralizing, and streamlining your workflows in ways that were previously unimaginable.





**The average employee spends eight hours of their work week searching for information.**

*-McKinsey Global Institute*

Integrating data and communication onto a single platform will drive up productivity, knowledge capture, and satisfaction. You'll be able to spend more time on the aspects of your job that you enjoy. You'll rebuild your old systems to fit your current needs. And you'll communicate more efficiently with your coworkers and clients.



*One study found most people average only 3 minutes on any given task before switching to something else (and only 2 minutes on a digital tool before moving on).*

# SIX.

## How to Become a Visual Programmer: Taking Control of Your Future

By now you're wondering—how do I get started on my journey to become a visual programmer? **The answer is simple: get your hands dirty.** The great thing about visual programming is you can begin experimenting right away. So try building your first app. It may seem daunting at first, but once you begin, you'll be amazed at what you can accomplish.

Choosing the right idea for your first app is key. Try to focus on a small, contained problem you can solve within a couple weeks. Maybe there's a spreadsheet process that's been annoying you that you want to improve. Maybe there's a simple team dashboard you've been wanting to build. Starting with small ideas will help you build confidence as you work your way towards solving bigger problems—and building more complex apps.

## How Ouray Uses Kintone to Give Customers What Other Vendors Can't

Ouray Environmental Services is a Colorado-based environmental services company that provides emergency response support to companies with chemical spills or environmental cleanup needs around the world.

Ouray's founder Aaron Montgomery realized he would need to upgrade his business workflow as his company's workload grew. **One of the challenges he faced was finding a platform that he could control and maintain.** Most of the platforms he researched needed someone to build everything for him.

"It was important to find a platform I could maintain internally," said Aaron. "I wanted to avoid a situation where, if a colleague needed a change in permissions to export something, I'd have to email a vendor and then wait for them to see the email, login, and do it. I wanted to be able to go in and change things myself in 30 seconds."

**"It was easy to build exactly what I wanted using Kintone's drag-and-drop features. I could do it all myself."**

Aaron turned to Kintone after he realized he could quickly build custom applications in the visual application builder during the free 30-day trial.

Ouray's workflow saw immediate benefits. The company not only streamlined its invoice workflow process, they also made it paperless. As for maintenance? Aaron got exactly what he wanted: "If there's an issue with any of our applications, or if we need to make a change, we can do it immediately rather than sift through files or wait on some third-party vendor."

When it comes to market advantage, Aaron is secure in his decision to use Kintone. "I'm confident the level of analytics we can provide with Kintone is unique to Ouray within the industry. From what I hear, no one is doing anything as advanced."

**Read more customer stories [here](#) or use the QR code on the right.** You can use your camera phone to scan the code.



*A leader in the environmental emergency response industry, Ouray maintains a network of contractors in over 2,000 locations, with capabilities in over 160 countries.*

*These images showcase a series of environmental cleanups Ouray provided service for.*





Next, it's time to start prototyping. Visual programming tools like Kintone are great for rapid prototyping because they let you experiment freely, without fear of breaking anything. Simply create a trial and start playing around. Using Kintone's visual programming tools, you can quickly put together a data model, interface, dashboards, and custom processes—all without having to write code.



Luckily, there are tons of online resources to help you learn. Kintone has a wide range of training videos on YouTube, an online developer community, and annual events where you can learn new skills and become a better visual programmer.

Be sure to watch these training videos as you build out your first app—they'll be a huge help. And when you have questions, hop into the Kintone community to get answers. One of the most important tools for a new visual programmer is being able to connect with other visual programmers—and Kintone's community is full of companies, nonprofits, and individuals who have built amazing applications using these awesome tools. So don't hesitate to get in the mix.

Above all, go easy on yourself and enjoy the process. Building an application is a process of trial and error. Build a prototype, show it to users, and then improve it bit by bit. Mastering these tools takes time—but the best way to start is simply to start. And pretty soon? You'll be saying, "I'm a software developer now." Just like the rest of us.

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# START NOW.

## Build Your Own Business Apps with a Free Trial of Kintone

### Free 30-Day Trial

Start a free 30-day trial with Kintone and learn how to build your own business applications. Kintone's free trial requires no credit card to use. Visit the link below or scan the QR code.

[www.kintone.com/trial](http://www.kintone.com/trial)



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### Video Tutorials:

Watch our tutorial videos to quickly get set up in Kintone:

[www.youtube.com/user/kintoneglobal](http://www.youtube.com/user/kintoneglobal)

### Kintone Help Center

The Kintone Help Center features step-by-step guides, how-to articles, and other developer resources to help answer any questions you have about the Kintone platform.

<https://get.kintone.help/hc/en-us>

## RESOURCES

Burning Glass | Beyond Point and Click

[https://www.burning-glass.com/wp-content/uploads/Beyond\\_Point\\_Click\\_final.pdf](https://www.burning-glass.com/wp-content/uploads/Beyond_Point_Click_final.pdf)

Burning Glass | They Hybrid Job Economy

[https://www.burning-glass.com/wp-content/uploads/hybrid\\_jobs\\_2019\\_final.pdf](https://www.burning-glass.com/wp-content/uploads/hybrid_jobs_2019_final.pdf)

Burning Glass | “The Hybrid Job Economy: How New Skills are Rewriting the DNA of the Job Market”

<https://www.burning-glass.com/research-project/hybrid-jobs/>

Forrester | “The Future Of The Enterprise Software Industry”

<https://www.forrester.com/report/The+Future+Of+The+Enterprise+Software+Industry/-/E-RES154975#>

Full Scale | “Talent Shortage of Software Developers”

<https://fullscale.io/talent-shortage-software-developers/>

Gartner | “Gartner’s Top 10 Security Predictions 2016”

<https://www.gartner.com/smarterwithgartner/top-10-security-predictions-2016/>

McAfee | Custom Application and IaaS Trends 2017

<https://www.mcafee.com/enterprise/en-us/assets/skyhigh/white-papers/wp-csa-survey-custom-apps-iaas-survey-report.pdf>

McAfee | “Every Company is a Software Company”

<https://www.skyhighnetworks.com/cloud-security-blog/every-company-is-a-software-company-today/>

McAfee | “What Is Shadow IT?”

<https://www.skyhighnetworks.com/cloud-security-university/what-is-shadow-it/>

McKinsey Global Institute | “The social economy: Unlocking value and productivity through social technologies”

<https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-social-economy>

Pega | “Research Reveals Employees Switch Apps Over 1,100 Times a Day”

<https://www.pegacom/about/news/press-releases/research-reveals-employees-switch-apps-over-1100-times-day>

RescueTime: blog | “Context switching can kill up to 80% of your productive time (here’s what to do about it)”

<https://blog.rescuetime.com/context-switching/>

Valamis | “Why Do We Spend All That Time Searching for Information at Work?”

<https://www.valamis.com/blog/why-do-we-spend-all-that-time-searching-for-information-at-work>

Wikipedia | Colossus Computer

[https://en.wikipedia.org/wiki/Colossus\\_computer](https://en.wikipedia.org/wiki/Colossus_computer)



[www.kintone.com](http://www.kintone.com)

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