



Make w/ **MORE.**

Unleash citizen developers
while staying in control

<Executive Summary>

Make With More

Citizen development is the most promising way to overcome the talent gap in software development.

Software development talent remains scarce, only 1.9% of software developers are jobless¹. Fortunately, low-code application development platforms have simplified application development. In addition, the workforce is becoming increasingly more tech savvy. Enterprises should harness their previously untapped creative potential in the form of non-traditional developers to deliver operational efficiencies, new ways of engaging customers, and new products and services.

Citizen developers will need the support of professional developers.

While software development is getting easier, it would be unreasonable to claim that anyone can build anything. The reality is that some use cases, integrations, and complex requirements require deep technical expertise to deliver successfully. Citizen development tools that incorporate the ability to gain assistance from AI assistants and professional developers are key to enabling citizen developers to fully participate in software development.

Citizen development programs need governance that fits.

IT leaders often avoid encouraging business experts to start building their own software, for fear of losing control. Every enterprise has been burned by well-meaning folks in the business building apps or desktop databases that ultimately result in significant unplanned support costs. For citizen developer programs to be successful, seek tools that provide full visibility into what apps are being built, deployed, and used. Ideally, platforms should give citizen developers an accessible way to prototype and develop simple apps, while giving IT full control to manage approval, security, deployment, and reporting of citizen-developed applications using the same policies and flows they use for professionally-developed applications.

<More People Can and Should Build Software>

Make With More

It is no surprise that to stay competitive, enterprises need increasingly more and better software. However, analyst firm Gartner predicts that by 2021, market demand for apps will grow at least 5X faster than IT's capacity to deliver them. With the current software developer unemployment rate at 1.9% in the United States, talent scarcity is the key factor limiting application delivery capacity.

Most demand for software is driven by customer expectations. Today's consumers in both B2C and B2B spheres expect digital experiences, fast answers to questions, interactions on a variety of channels, and real-time information. Customers know what they want, and vote with their wallets accordingly.

These customers are people who have these experiences and expectations; and they bring these opinions to work with them as well. Today's workforce contains people like Rik (see maker profile), who see how business works today and how it could be better. When they see business problems, they think software solutions. They know your data, process, and customers best, but historically it has been hard to turn their knowledge into working applications. That's changing.

The workforce is more tech-savvy than ever, particularly as new graduates begin working. The person installing voice controlled light bulbs in their home is different from the person that needed a technician to hook up a DVD player. In the work sphere, technology plays an increasingly large part as well: today's jobs increasingly involve data, and many departments have individuals with sophisticated Excel skills. Most business schools have added coding (Python, SQL, R) to their curricula. People like Rik can make an impact on their business because they're comfortable with technology and acquired skills that help them solve today's problems effectively.

<More People Can and Should Build Software>

Make With More

Even that's not the entire story, though. Improved tools and online training academies have drastically reduced the barriers to entry to software development. Low-code application development platforms, which offer a visual style of programming, have substantially decreased the skills threshold to building software. In short, it has never been easier for more people to build, deploy, and maintain a custom application.

This combination of a tech-savvy workforce and far more accessible software development tools is a potent one. It is enterprises' best opportunity to address the gap between software demand and software development supply.

<Citizen Developer Profile>

Make With More



Rik Bos
Citizen Developer

Rik Bos studied financial law and economics at university, and now works at his family's elevator maintenance business. Growing up, he always dabbled in technology; in his teens, he was building websites and playing with SQL and PHP. His family's business has struggled to find the right way to incorporate software: off-the-shelf software didn't fit their requirements and their experiences with custom software development projects using consultants were a time and money sink. Rik believed he could do a better job than either of these options, and used a low-code platform to build a custom ERP system. He followed this up by deploying a predictive maintenance solution. These applications made his family's business more efficient and reduced maintenance costs by 30% - major improvements for this industry's typical benchmarks. Rik is very talented, but he is not alone - he's an example of an individual that understands business first and technology second to deliver solutions that move his business forward. A citizen developer.

<Taking the Right Governance Approach>

Make With More

We've seen how applying the capabilities of tech-savvy employees to the software development process can offer substantial business value, but many organizations rightly identify that this also represents risk. What happens if sensitive data is accidentally made available to the wrong audience? Or if a small app built by someone in Finance gains broad adoption, but the data is not protected? Or if an application relies on a version of a database that requires a critical upgrade? IT governance exists to solve problems like these, yet citizen developers tend to operate outside of it.

At the same time, just bolting traditional IT governance onto citizen development, and expecting these non-professional developers to understand and comply with these requirements, is not practical. The strong focus on prevention and access restriction can make it too cumbersome - or outright impossible - to get started, which means great ideas to improve the business ultimately never materialize. It is time to find a more appropriate balance between unleashing the creative energy of people like Rik, with the real need for IT governance.

Instead of blanket preventative governance, enterprises should consider detective and corrective governance models combined with appropriate guardrails in citizen development tools. When large numbers of individuals start building applications it is crucial to see who is building what, which applications are actually used, and how many people use those applications. It is also crucial to have AI-assisted development and automated error checking, to reduce the need for human intervention from highly-paid professional development resource. Finally, when applications reach certain usage or complexity thresholds, IT needs visibility into this to determine when the application needs additional IT stewardship. Ultimately, clear communication and a collaborative partnership between business and IT will produce the best results.

<The Limits of Citizen Developers>

Make With More

While the potential value of enabling business users to develop applications is higher than ever, many use cases still require the involvement of professional developers. This is particularly true in the domains of integrations, performance at scale, and technical complexity. In some cases its not the citizen developer's skills, but the tools available to citizen developers, that create a limitation. For many citizen development tools that aren't part of a larger development platform, these limitations require a professional developer to use the tool's software development kit (SDK) to code around a limitation. Depending on the availability of coders and their familiarity with the platform's SDK, even small hiccups can take significant time to overcome.

Recognizing the limits of citizen developers is important; similarly, recognizing the limits of various citizen development tools is equally important. Tools that enable citizen and professional developers to seamlessly hand off work to each other, and tools that enable professional developers to create reusable modules for citizen developers, are the keys to seeing application ROI with citizen developers.

<Citizen development the Mendix way>

Make With More

Mendix Studio

Mendix Studio is a no-code application development environment. People without coding experience can build simple and straightforward business applications themselves by dragging and dropping elements. Studio is designed with non-programmers in mind, with appropriate tools, abstractions, and guardrails.

Visual development in itself is far more accessible than written code. Mendix Studio builds on that with even more support for business users building their first ever apps: Mendix Assist is an AI-assisted development coach, that is trained on millions of apps. Today, 60% of Studio developers take advantage of the suggestions provided by Mendix Assist. Other guardrails such as automated consistency checking and a library of building blocks further help citizen developers stay on track.

Security and visibility

In Mendix, citizen developers are prevented from exposing data by accident. All apps built with Mendix Studio have security “on” by default. This means that the developer needs to actively invite users to access the app. For further security, users can be synced with Active Directory or various other single sign-on providers.

Mendix offers full visibility into what apps are being built and used by whom. Organizations concerned with “Shadow IT” should appreciate the visibility available in the Mendix administrative suite. Administrators can answer questions such as ‘How many apps do we have with more than X users?’, “How many apps are under active development?”, and “Is at least one person on this team professionally trained?” With this capability, organizations can implement policies like

<Citizen development the Mendix way>

Make With More

“Applications with under 10 users are managed by citizen developers, and once they are larger than that, IT takes over.”

One reminder: platform features can only model policies. Ultimately, a culture of collaboration will do more to alleviate governance concerns than any technology could do.

Mendix Studio Pro and collaboration

Complementing Mendix Studio is an IDE designed for professional developers, known as Studio Pro. Many of the 200,000+ applications that have been built on Mendix since 2004 have been created in Mendix Studio Pro, such as a parcel delivery system serving 17 million people², the #1 health insurance app in the Netherlands³, and a collection of micro-services running the fastest growing real estate brokerage in the US⁴.

Mendix Studio and Mendix Studio Pro sync bidirectionally, which means applications started in Studio can be opened and enhanced in Studio Pro and vice-versa. This allows for several types of collaboration, starting with professional developers helping citizen developers overcome obstacles. Further, Studio and Studio Pro together enable professional developers to involve the business during development to better understand requirements and deliver the right solution sooner. Finally, business users can use Studio to build prototypes for later completion by professional developers in Studio Pro.

<Conclusion>

Make With More

Citizen Development represents the best opportunity for enterprises to address the shortage of software development resources. With low-code vendors, software development is more accessible than ever, yet loose implementations represent a real risk.

Mendix Studio helps citizen developers build high-quality apps with AI-assistance and consistency checks, under the loose oversight of IT. Mendix combines no-code and low-code in a single platform, enabling citizen developers to build on the same enterprise-grade platform as professional developers, allowing them to collaborate when needed.

With Mendix, your enterprise can strike the right balance between enabling the business to contribute to software development and ensuring the compliance and security that IT requires.

Referenced sources:

¹Bloomberg - Demand for Programmers Hits Full Boil as U.S. Job Market Simmers

²PostNL - High Volume, Massive Scale, Mission Critical: Canada Post and Post NL Share How They Operate and Innovate in Environments with No Room for Error

³VGZ - How VGZ is Combining Radical Digital Transformation with Superior CX at Lower Costs

⁴eXp Realty - The Aha! Moment: How eXp Realty Reached the Decision to Build a Microservices Architecture