

Chair's Corner

BY MOHAMMED BILLOO



I am honored to serve as Chair of the IEEE-USA Consultants Committee. Although I have been practicing professionally for 15 years in embedded software and systems, I am new to consulting. I started my practice as a side hustle five years ago, transitioning to a full-time consulting role a year later. Soon after, I joined the IEEE-USA Consultants Committee and learned how the committee strives to be a resource for new and experienced consultants. I observed the committee members are genuinely interested in serving consultants. The committee held webinars to help consultants navigate challenges during the COVID-19 pandemic, the California AB 5 bill, and subsequent national efforts. Personally, I was able to lean on committee members to help me navigate challenging times in my practice.

My recent experience in starting a consulting business, especially in tumultuous times during the COVID-19 pandemic, can help newer consultants navigate the fears and challenges of starting a business. I also hope to improve the existing community.

On that note, the committee has three main objectives. First, as we have done in the past, we will continue to help

new and experienced consultants. For newer consultants, we are planning webinars to help them navigate the challenges of starting and running a business. For experienced consultants, we will hold webinars to discuss the nuances of running a consulting business, from legal structures to contract negotiations. We also plan to hold webinars on how consultants can effectively use modern tools, such as AI, to streamline their business -- and some associated pitfalls.

Second, we're making a concerted effort to heavily market the IEEE-USA Consultant Finder. The IEEE-USA Consultant Finder is a great tool to help consultants provide their services to prospective clients. We will use LinkedIn and other social media platforms to advertise the IEEE Consultants Finder to help consultants gain more business.

Finally, in the same vein of helping consultants secure opportunities, we are going to hold webinars targeted to prospective clients. We will discuss the advantages of hiring a consultant over securing full-time employees. We will also educate them on working with a consultant at all stages of the process, so they know what to expect. ■

2025 IEEE-USA Consultants Fee Survey Coming Your Way in April 2025

The IEEE-USA Consultants Committee is alerting readers we will be emailing the 2025 IEEE-USA Consultants Fee Survey to IEEE members in April. This important survey allows us to gather data to determine median hourly fees for independent consultants. In addition, the survey allows us to create profiles of typical engineering and technology consultants. Consultants, when you receive this email, please participate in the survey. For those IEEE members who are full-time consultants, but have never received the survey and want to participate, contact Daryll Griffin d.r.griffin@ieee.org, so he can include you on the survey distribution list. ■



Spotlight On: Jacob Beningo, CEO & Founder, Beningo Embedded Group

BY GEORGIA C. STELLUTO

Each quarter, [IEEE-USA InSight](#) will profile a consultant listed in the IEEE-USA Consultant Finder, so you can become familiar with some of the excellent technical experts our database has to offer, who can tend to your technological needs. Our first Spotlight is on [Jacob Beningo, CEO & Founder, Beningo Embedded Group](#).

Jacob Beningo is an embedded software consultant, educator and entrepreneur. He specializes in helping companies modernize their embedded software development processes, focusing on areas like build systems, software architecture, DevOps, Simulation, and AI/ML techniques. Beningo is originally from Michigan; and his passion lies in improving the way embedded systems are designed, developed and maintained.

Beningo has always been fascinated by how things work. As a kid, he loved taking things apart. Initially, little Jacob started putting toys in places they shouldn't be — like VCRs — so his parents had to help him take them apart to find his toys. Over time, he progressed to radios, remote controls, TVs, etc. That curiosity led him to study electronics and software, then leading him to embedded systems. That combination of hardware and software engineering has kept Beningo engaged ever since.

After working in the industry for several years, Beningo saw a recurring challenge: companies struggling to develop high-quality, maintainable and scalable embedded software. He wanted to have a bigger impact by helping multiple companies solve these issues, rather than being limited to just one company at a time, through the normal employment process. Consulting allows him to share best practices across different industries; work on a variety of exciting projects; and help companies succeed by optimizing their development processes.

Enter the IEEE-USA Consultant Finder. Beningo joined the IEEE-USA Consultant Finder as a way to connect with companies and individuals looking for embedded software expertise. “One of the best things about it is that it provides a direct way for companies to find specialized consultants who can address their unique challenges,” he said. In addition, he offered, “It also helps build credibility and visibility in the engineering community. I've also found

it useful for networking with colleagues, and finding other consultants to help cover skill gaps in projects that I'm working on.”

Beningo's specialty is embedded software development, with a strong focus on real-time systems, software architecture, and modernizing embedded development practices. What he enjoys most is the problem-solving aspect — finding elegant, efficient and scalable solutions for complex systems. Beningo also loves teaching and helping engineers upskill to become more effective in their roles. “I've found that a lot of teams struggle to integrate moderate techniques — slowing them down, and causing them to deliver late — and over budget,” he said.

The variety of projects and the ability to make a meaningful impact are what Beningo enjoys most about consulting. He gets to work with different teams, industries and technologies — keeping things fresh and challenging for him. For those considering consulting, Beningo's advice is to start by identifying what problem(s) you like to and can solve, and who your ideal client is. He says once you understand your focus, it's easier to build your expertise and personal brand. “Then you can establish yourself as a thought leader through blogging, speaking, or open-source contributions,” Beningo noted.

He counsels that if you aren't sure who you want to help, starting out as a contractor, or moonlighting on projects, can help you get a wide variety of experiences. In turn, those experiences will help you decide where you can provide the most value.

Beningo also says it is important to ensure you have strong business fundamentals — understanding contracts, pricing and client relationships is just as important as having good technical skills.

Lately, Beningo has been exploring AI-driven software development, and its implications for embedded systems. He believes that while AI-generated code can speed up development, it also introduces new challenges, such as ensuring reliability and security in real-time applications. Beningo finds it a fascinating area that will continue to



evolve. “There’s a lot that can be done with AI that I believe a lot of developers and teams are currently overlooking,” Beningo said.

Recently, Beningo launched a new [Embedded Software Academy initiative](#), one focused on modernizing embedded development practices. It provides structured training and resources for engineers looking to improve their skills in areas like RTOS, Rust, and DevOps. He says seeing the impact it has had on engineers and companies has been incredibly rewarding.

Another initiative always near and dear to Beningo’s heart is the [Embedded Online Conference](#) (taking place in mid-May). Beningo gets some of the world’s best experts on embedded systems together — and they spend a week sharing their vast knowledge with attendees.

Beningo says consultants enjoy a lot of variety in their workdays. His typical day is broken up into work periods, allowing him to do his best work, at his best. Beningo gets his most important work done first thing in the morning when he is fresh; then, he pushes meetings, or other less creative activities (like coding) to the afternoon. Beningo outlines a typical day as perhaps looking something like:

- Working on technical projects — writing code, reviewing architecture, or debugging embedded systems
- Meeting with clients to discuss project progress, challenges and solutions
- Developing training materials, or conducting workshops for engineering teams
- Writing articles, blog posts, or preparing presentations on best practices in embedded software development

“It’s a balance of hands-on technical work, mentoring and business development,” Beningo said.

Beningo stays up-to-date in his area of expertise, through a combination of:

- Reading industry blogs, white papers and technical publications
- Attending and speaking at conferences — like Embedded World, and the Embedded Online Conference
- Engaging with other engineers and thought leaders on LinkedIn and professional networks

- Experimenting with new tools and technologies through hands-on projects

In a competitive world such as ours, Beningo says continuous learning is essential in his field.

As CEO and Founder of Beningo Embedded Group, Beningo says: “I make it a priority to stay ahead of emerging trends.”

Being listed in IEEE-USA’s Consultant Finder has helped Beningo increase his career visibility, and connect him with companies looking for embedded expertise. While much of Beningo’s work comes through referrals, being listed in the Consultant Finder has provided him another avenue for companies to find and reach out to him. It also reinforces his professional credibility in the field.

If you are a company looking for an embedded software consultant, you can find Beningo’s IEEE-USA Consultant Finder profile [here](#). You may also search the Consultant Finder for relevant keywords like “embedded systems,” “RTOS,” or “firmware architecture.”

Put joining the IEEE-USA Consultant Finder at the top of your priority list! With this excellent career tool from IEEE-USA, you can:

- Find Consultants: Use the powerful search features to locate your next technological consultant. Easily find experts by technical specialty, geographic location or licensure/certification requirements.
- Post Assignments: Posting an assignment, project or task allows consultants to review the job specifications and contact you, if they fit your needs.
- Get Noticed: Make it easy for clients/companies to find you by uploading your profile and making it visible to organizations seeking your expertise.
- Join IEEE: Join a community of more than 400,000 technology and engineering professionals united by a common desire to continuously learn, interact, collaborate and network with other professionals in your local area, or within a specific technical interest.

You can contact the IEEE-USA Consultant Finder Team by going to: <https://iee-collabratec.ieee.org/ieee-usa-consultants/contact-us>.

Go to <https://iee-collabratec.ieee.org/ieee-usa-consultants> — and get listed, or find your next consultant today! ■

This article originally appeared in [IEEE-USA InSight](#).

Your Professional Liability Risk Management Refresher

BY COLLEEN M. PALMER, ESQ. - THE BEAZLEY GROUP



It's time to get your risk management house in order and ensure your firm is embracing sound risk management practices. With that in mind, we offer some key tips to help you manage risk on projects.

Stress the importance of risk management in your firm culture: Successful engineering firms that consistently have superior claims history as compared to their peers have robust risk management programs that are embraced by all employees. An effective program is embedded into corporate culture and emphasizes risk management as a priority. Successful firms are not necessarily completely risk averse, but they carefully assess the risk vs. reward balance for each project and client.

Evaluate clients and projects carefully: Despite the excitement and potential fee associated with a new project, it is critical to objectively assess the client and project. Some project types and some clients are inherently risky or difficult. Use a formalized “go/no-go” process to evaluate the potential risk and reward for each project.

Assure your firm is prepared: Before you proceed with any project, confirm you have the proper skill set and necessary workforce. Problems may arise if your staff is stretched too thin to devote the appropriate resources or if inexperienced staff takes on services without the necessary knowledge and experience. Insufficient time to dedicate to a project and/or lack of knowledge increases the chance of technical errors, which in turn, increases the chance of claims. If you anticipate the need to retain consultants, discuss the plan with your client and ensure your contract allows you to retain them as necessary.

State your scope of services with detail and clarity: Your scope of services should be well defined and clearly detail what services constitute basic, additional, and (to the extent known) excluded services. Do not incorporate the client's request for proposal, or your proposal, to avoid the possibility of conflicting language which could lead to disagreement regarding your required scope.

Offer and seek mentoring opportunities: Have a formalized process to ensure junior staff receive guidance from senior practitioners. Mentoring reinforces firm processes and culture, and helps new professionals develop the “soft skills” necessary to communicate with clients and construction team members.

Negotiate your contract: Have a written, executed agreement prior to performing services on every project. In addition to defining the parties' responsibilities and rights, the negotiation process lets you assess and manage the client's expectations and educate the client regarding your customary role and value of services.

Give news to the client timely: Keep the client informed of the progress of the project and, at a minimum, comply with contractual obligations to provide status reports. If you must deliver a disappointing update, offer recommendations and discuss client concerns. A proactive engineering technologist armed with a possible solution can help avoid client disappointment and manage client expectations going forward.

Establish and follow a document retention policy: Have a formal, written policy that addresses how long to keep each type of document, including electronic documents.

A well-documented project file may help avoid claims and provide legal defenses in the event of a claim situation. Generally, documents not kept permanently should be retained for the longer period of 10 years after substantial completion of the project or the applicable Statute of Repose, or any longer period specified in your professional services agreement.

Examine your insurance policy: Have the types and limits of insurance required by law and your professional services agreement. Pay careful attention to how long your contract requires you to maintain the policies and if you are required to maintain the full limits of insurance, even if a claim impacts the amount of insurance available. Professional liability insurance is a depleting limits policy; therefore, if a claim unrelated to the project diminishes the available insurance, but your contract requires you to maintain full limits, you would be required to purchase additional insurance to satisfy your contract. Require any consultants you retain to have appropriate insurance policies in place, including professional liability insurance.

Trust your instincts: Far too often, design professionals involved in a claim “knew they shouldn’t have taken the project,” but they decided to proceed despite their reservations. Don’t ignore your instincts: if your research of a potential project or client gives you a bad “gut feeling,” carefully consider whether to proceed or walk away. If you take the project, ensure your contract is appropriately negotiated with protections (such as limitation of liability and waiver of consequential damages provisions) and that you vigorously document the project.

Investigate your jurisdiction: Have an understanding of the jurisdictions in which you practice since states vary as to how they treat various contract provisions (e.g., the enforceability of limitation of liability provisions and indemnity obligations). In addition to contractual issues, the location may present unique issues with respect to sub-surface conditions or climate that may be regulated by applicable codes and regulations of which you must be aware.

Never admit liability to your client: Even if it’s obvious you made a mistake on a project, do not admit liability since mistakes do not necessarily equate to legal liability and admissions may resurface in litigation as evidence against you. Under common law (and hopefully in an appropriately drafted standard of care provision in your contract), you are required only to perform in a manner consistent with the generally accepted professional standard of care ordinarily exercised by reasonably prudent professionals. Since you are not required to perform perfectly, the existence of an error or omission in your services does not necessarily mean you breached the standard of care. Rather than conceding liability, tell the client you will investigate the issue, report the matter to the appropriate person in your firm, and contact your professional liability insurance broker to develop a plan to further handle the matter.

Stay out of jobsite safety issues: Engineering Technologists are not responsible for jobsite safety and should delete any contract language suggesting otherwise and add language explicitly disclaiming responsibility for jobsite safety programs and precautions since such responsibility lies solely with the contractor. If you see an obvious and dangerous condition that threatens life safety, alert the person in charge of the jobsite of the condition, but stick to the facts and do not provide any recommendation regarding remedying the condition. Follow up with written communication reporting your observation, but do not make any recommendations and do not check to see if the condition has been corrected.

IEEE consulting members and those considering the opportunity to become self-employed...or even those considering undertaking a single consulting project, can learn more about their exposure to risk and ways to mitigate exposures with contracts and insurance, in addition to prudent business practices. These resources can be found in the [IEEE Risk Management Hub](#). Information about the professional liability insurance and related policies as well as the online application for coverage are at [IEEEinsurance.com](#). ■

Local IEEE Consultants Network News



In February, at the request of the [Boston Consultants Network](#), we shared with all IEEE local Consultants Network Chairs an invitation for their members to attend the Boston Consultants Network webinar on “*Consultants Panel: Applications of Using a Consultant- Hiring a Consultant - Being a Consultant.*”

On 8 March, the [IEEE Consultants Network of Long Island \(LICN\)](#) held a presentation on Enterprise Resource Planning (ERP) systems. The session offered a comprehensive overview of the evolution of ERP systems -- beginning with their origins

in the 1960s as basic inventory management tools, and following their transformation into integrated solutions that manage nearly every function within modern organizations. [LICN](#) is a very active local network, so if you're in the area and want to learn about independent consulting, check them out.

On 19 March, the [Ottawa Section Consultants Network](#) asked our IEEE-USA Consultants Committee Chair Mohammed Billoo to give a virtual presentation to university students in Ottawa, about how he got into consulting. Billoo provided

inspiration to young IEEE members, who may select consulting, as a future career option.

In March 2025, the [IEEE Twin Cities Consultant Network](#) surveyed their members to find out what topics, events and resources would be most helpful to their consultant members.

On 8 April IEEE Consultants Network of Silicon Valley will be offering a free webinar titled, “*Agentic AI: The Next Evolution of Generative AI.*” The webinar portion of the presentation is free to IEEE members. Please review their rules for participation.

NCEES Seeks Licensed Control Systems Engineers' Professional Expertise and Advice

NCEES is currently seeking licensed control systems engineers to participate in a Professional Activities and Knowledge Study (PAKS) for the PE Control Systems exam. The results of this online survey will be used to update specifications for the exam, used throughout the United States for licensing purposes.

NCEES requires a cross section of licensed professional engineers practicing control systems engineering — including those working in industry, consulting, the public sector and academia — to complete an online survey about the tasks and knowledge required of a licensed control systems engineer, with four to six years of experience; to practice in a manner that safeguards the health, safety and welfare of the public. The survey can be completed in approximately 30–40 minutes.

“These studies help NCEES ensure its licensing exams remain relevant to current professional practice,” explained Chief Officer of Examinations J. Lehmon Dekle, P.E. “The value of this PAKS depends on the number of people who participate, so NCEES is eager to get a large response from professional engineers across all areas of control systems engineering.”

For access to the online survey, visit <https://www.ncees.org/CSPAks>.

The survey opened 13 January and will remain open until 22 May. For more information please contact: William Bowen, wbowen@ncees.org. ■



AROUND THE WEB

Consulting Could Be an Option for You

INDEPENDENT CONSULTANT NUMBERS ON THE RISE

According to the Bureau of Labor Statistics, approximately 11.9 million people in the United States work as independent consultants/contractors as their primary job. This statistic means that independent consultants/contractors and freelance workers represent 7.4% of total employment in the United States. The website, Consultport, has outlined "[Why the Number of Independent Consultants is on the Rise](#)" -- why more people are turning to consulting as way to earn a living.

IEEE OFFERS AI TRAINING COURSES AND A MINI MBA PROGRAM

For businesses wanting to train their staff about AI technology, IEEE offers a comprehensive education program designed to enhance knowledge and skills in this rapidly evolving field. This [IEEE Spectrum article](#) provides comprehensive list resources members can access to educate themselves and their staffs.

ALABAMA IS TRYING TO PASS LEGISLATION TO ALLOW FOR PORTABLE BENEFITS FOR INDEPENDENT WORKERS

Alabama is looking to become the 2nd state to allow for portable benefits for independent workers. Their [Senate Bill \(SB 86\)](#) facilitates the creation of portable benefit accounts for independent contractors, including gig economy workers.

UPWORK PROVIDES 15 REASONS WHY COMPANIES SHOULD HIRE FREELANCERS

Consultants looking to provide added incentives to have new clients bring them onboard might find this article of interest. [Upwork](#) provides a few reasons consultants can include in their pitch about why they are the answer to their potential clients' problems.

BECOME A BETTER MULTITASKER

Studies show that [58% of freelancers](#) find it challenging to manage their time. The [Freelance Union provides Six Best Practices](#) that will help consultants manage their time, including tasks to improve your efficiency.

Have You Posted Your Profile to the IEEE-USA Consultant Finder?

<https://ieee-collabratec.ieee.org/ieee-usa-consultants>



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Micro-Volunteering: Small Actions, Big Impact

BY LARRY G. NELSON, SR.

In today's fast-paced world, many people want to give back, but struggle to find the time for traditional volunteer commitments. Micro-volunteering offers a flexible, accessible solution — allowing individuals to contribute in small, yet meaningful, ways. Whether it's writing letters, sharing social media posts, making a few short phone calls, or finding a speaker for an event, micro-volunteering enables people to make a difference in just minutes.

Micro-volunteering involves short, task-based activities that can often be completed remotely. This approach is especially good for a consulting network, because it allows busy professionals to provide much needed help and skills, without requiring long-term commitments; and those who prefer virtual opportunities can also participate. Micro-volunteering pulls in those that do not want a leadership role or commitment but are willing to help with one-shot assistance.

These simple steps will help you to successfully use micro-volunteering in your consulting network or other organizations:

1. Identify Micro-Tasks – Break larger projects into smaller, independent activities that volunteers can complete quickly. Brainstorm with your group to

identify things to help your group grow and achieve success in its mission

- 2. Use Digital Platforms** – Leverage websites, newsletters and social media to promote and coordinate micro-volunteering opportunities. Ask for help with single, specific, finite tasks
- 3. Make It Easy** – Provide clear instructions, and ensure tasks are simple, to complete without extensive training or work
- 4. Recognize Contributions** – Show appreciation through your website, newsletter, social media, and even at an annual meeting / dinner to keep volunteers motivated
- 5. Track Impact** – Monitor participation and outcomes to assess effectiveness and improve future initiatives

Micro-volunteering empowers individuals to support causes they care about in ways that fit their schedules. Organizations embracing this model can maximize their impact, engage a broader audience, and create a culture of giving that thrives on small, meaningful actions. Start implementing micro-volunteering today. Watch how small efforts lead to significant change. ■