synED®

Agents of Change Volume 3:
SAN DIEGO CYBER CENTER OF EXCELLENCE:

Inspiring Community Vision and Cross-Sector Collaboration

FORWARD

Over the last ten years of assisting educators with the challenges of preparing students of all ages for careers, we have come to a single conclusion. IT IS PERSONAL! Every person is different, every community different and the needs of every business are unique. Investigations in Career Development seek out unique and highly successful efforts that look beyond generally accepted labor statistics on what jobs are available, to truly understand the connection points between trained individuals and the employers who want to meet them. This series examines the personal motivations and strategies implemented by public and private organizations and organizes their stories into key points that can be used by others. This effort is a celebration of the creative and innovative thought and action happening across the country.

SynED sits in a unique, "bird's eye", position to see the career and workforce development system and the employers who hire people across the country. The purpose of this series is to do real storytelling about people like you, who witness or experience the gaps in the system, daily, and do something about it. We tell these stories, not only to inspire others to think creatively but also to create a narrative of what must be done to create a better approach that works for everyone.

Scott Young
President and Executive Director
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A Call to Action

A decade ago, the San Diego region was preparing for the stark reality of impending congressional budget cuts for the U.S. Department of Defense. While many communities were concerned with these budget cuts, San Diego business leaders and elected officials were sounding the alarm that the region's economy would be severely impacted.

Dating back to the turn of the 20th century, the San Diego region has been an important hub for nearly every branch of the United States military, as well as the private sector defense industry that serves those branches. Well over half of all U.S. military assets in California are based in San Diego, and Department of Defense activity in the region accounts for approximately 25 percent of the local economy. According to the San Diego Military Advisory Council, San Diego is home to the largest concentration of military in the world, including more than half of the U.S. Pacific fleet and a quarter of the entire U.S. Navy fleet.

Coming out of the Great Recession, however, Congress set out to trim billions of dollars from the Defense budget, and San Diego would inevitably feel the effects. Beyond rallying leaders to fight the budget cuts, the San Diego Regional Economic Development Corporation (SDREDC) made an important decision to counteract the cuts by exploring the promotion of a new hub of employment and innovation in San Diego centered on cybersecurity and related services. Eventually, this idea would blossom into the San Diego Cyber Center of Excellence.

This issue of *Agents of Change* provides a historical lookback at how the San Diego region approached a looming threat to its economy and pivoted to mitigate the impact while laying the foundation for a new and robust industry sector. The lessons provided within are for any community dependent on one industry that is seeking to diversify within or beyond that industry so as to support entrepreneurs, attract new businesses and grow the local workforce.

A Foundation for the Future

San Diego is home to the United States Navy's Naval Information Warfare Systems Command, or NAVWAR. NAVWAR is truly an anchor of the region's cyber industry, driving talent attraction and spending several billion dollars annually on private sector industry partners, developing and securing critical Navy systems.

NAVWAR is the engineering and systems command for the United States Navy. "We're the Navy's IT acquisitions command," explained **Pat Sullivan**, an early champion of San Diego's cyber economy who was then Executive Director of NAVWAR. "When I say IT, that's a big IT, because it includes satellite communications as well as terrestrial networks, because it's not like we can pull a wire behind us. The Navy is the ultimate wireless user."

One major reason for NAVWAR's importance is that the Navy can only update or repair its ships every two years, because they deploy for months at sea, and the management of hardware and information technology systems on ships can get quite complicated.

NAVWAR currently employs more than 11,000 civilian and military personnel, with more than 5,000 in the San Diego area, representing a significant share of all cyber jobs in the region. About 60 percent of all cyber firms in the region work directly or indirectly for the Federal government, including the Department of Defense. About one-third work exclusively for the military.

As a first step, the SDREDC commissioned a local cyber economic impact study, bringing together not only Defense officials but also private sector companies in the region to assess the existing cyber assets and capabilities in the area and plot a course for

Pat Sullivan
NAVWAR Immediate Past Executive Director (Retired)

further developing the local cybersecurity workforce and industry. One of the largest cybersecurity companies in the region, Sentek Global, as well as Bank of America, provided funding for the study.

The March 2014 SDREDC-led economic impact and industry assessment was thorough and highly scientific. It found more than 6,600 cybersecurity workers in the San Diego region, almost half of whom worked at NAVWAR. More than half of the 102 private firms working on cybersecurity reported the Federal government being one of their primary customers. The report emphasized the need to diversify the customer base, reduce its reliance on the Federal government, and ensure more private businesses were a focus of cybersecurity firms. It also highlighted the biggest challenge for the burgeoning industry – finding an adequate supply of talent.

Eric Basu, founder of Sentek Global, described the challenges of finding and keeping cybersecurity workers. "We would hire people with no cyber skills at all, for $30,000 a year, and they would get job offers for $80,000 or $100,000 twelve months later, simply because they had that hands-on experience."

Another issue for local employers was keeping newly hired employees in San Diego when they came from outside the region. For many new hires the high cost

Eric Basu
CEO, Haiku (previously CEO of Sentek Global)

of living and lack of family and support systems meant they wound up leaving San Diego.

The data from the economic report was important for two reasons: it provided a high degree of confidence regarding where the challenges and opportunities lie, and it established a baseline for benchmark measurements going forward.

With data in hand, local cyber company leaders and the SDREDC made the decision to establish a new nonprofit that could independently take the lead on expanding the regional cyber sector. They launched the San Diego Cyber Center of Excellence on the same day they publicly released their economic impact study in March 2014.

WHAT IS A CYBER CENTER OF EXCELLENCE?

A Cyber Center of Excellence (CCOE) is a non-profit entity that focuses on regional planning and program implementation in order to address cybersecurity workforce, economic development and infrastructure challenges through collaboration with industry, academia and government agencies. The typical CCOE is either industry-led and funded, attached to an academic institution, or affiliated with a Federal or state government entity.

KEY TAKEAWAYS

- Start with verifiable, comprehensive, high-quality data – it will give you confidence in your path, and allow you to benchmark progress and update stakeholders periodically.

- Involvement and support from a local, regional or state Economic Development Corporation (EDC) is extremely helpful. They don't need to be the genesis of the effort, as in this case, but their expertise and connections to industry and government can make a difference. They'll also be your best advocate.

Building the Ship

The San Diego Cyber Center of Excellence chose a model of industry funding and leadership. One benefit of being industry-supported is that the organization stayed mission-focused and avoided 'mission creep' as can happen if an organization is too reliant on grant funding or must rely heavily on multiple partners representing different sectors of the economy.

The first Officers on the Board of Directors were Co-Chairman & President Rear Adm. (ret) Ken Slaght; ESET's Andrew Lee as Co-Chairman; Victor Ramsauer of LevitZacks as Treasurer & CFO; and Qualcomm's Kris Virtue as Secretary. The governance structure included an Advisory Board with a Navy representative being the first member (the Advisory Board was created because U.S. military personnel are not allowed to fund or make decisions for entities outside the U.S. military).

Critically, **Lisa Easterly**, then an employee of the San Diego Regional EDC, agreed to take on a new role as

Strategic Advisor and then Chief Operating Officer of the San Diego Cyber Center of Excellence. With a background in economic development and direct experience with a similar industry accelerator called Cleantech San Diego, she was a natural fit.

> *When starting a new regional consortium or industry accelerator, it is vital to have dedicated industry champions directly involved and to have an experienced leader of the nonprofit entity. Though the San Diego Regional EDC devoted staff time and other resources for the first year, these strong foundations allowed the San Diego CCOE to be self-sufficient and running smoothly once the EDC stepped back.*

"In a lot of ways, I would just say the early success was Lisa," **Mark Cafferty**, President & CEO of San Diego Regional EDC, shared. "When she was a part of EDC, Lisa was always a fantastic 'Point A

Lisa Easterly
CEO, San Diego Cyber Center of Excellence

to Point B' person. When she joined CCOE, she provided strategic and forward-thinking right out of the gate and was surrounded by industry leaders who had their eyes on the future of cybersecurity in San Diego and beyond."

Support networks and a highly engaged volunteer board have been hugely important for CCOE. The organization brought on pro-bono experts, including a general counsel, a public relations firm, and other experts in nonprofit governance to support the operation so that revenue could be spent on programs and not overhead.

A large part of the work of CCOE is still done by volunteers, with only two paid staff. Board members sometimes take on big projects, and often represent CCOE in various forums.

"I am very blessed to have a board of advisors and directors that, from the get-go, have leaned in and rolled up their sleeves, provided resources and guidance," Lisa Easterly said. "They've just been tremendous partners."

With CCOE established, the San Diego Regional EDC was happy to take on a supporting role and allow the new organization to set its own agenda. While there are still deep connections and continued collaborations between the two, the EDC does not dictate what success looks like for the members of CCOE.

CHOOSE THE RIGHT LEADER:

"Before joining CCOE, I cut my teeth in economic development as Vice President for the SDREDC, a nonprofit driving the growth of the local innovation, military and tourism economies. I learned valuable lessons about cultivating tech clusters as a Founding Board Member and Education & Outreach Chair for Cleantech San Diego, a nonprofit stimulating innovation and adoption of clean technologies and sustainable industry practices. Last but not least, I spent 10 years in business development at global corporate law and wealth management firms, honing my communications and marketing skills."

– Lisa Easterly

KEY TAKEAWAYS

- The dedication and active participation of major industry players is essential. So is pro-bono support from industry-adjacent service providers like legal, accounting, and marketing firms.

- Hire well – you may only have one employee, so make it count! Your board and advisors have the industry-specific knowledge – your organization needs administrative, communications and marketing skills.

- Identify segments of an industry that can help diversify your economic base.

- Identify a clear mission statement and identify leaders who are 100% aligned with the mission. Avoid mission creep.

- If an Economic Development Corporation or Chamber of Commerce is involved at the start, they should refrain from dictating what success looks like for members of the new organization.

- Identify early funding from mission-aligned sources.

- Identify a leader who has the relationships and experience to launch the initiative.

The Talent Pool Delta

"Almost every partner in CCOE, including myself as a founding member, the reason they're there is access to talent," explained Eric Basu, now the CEO of Haiku, a cloud-based cyber-range that helps users gain hands-on experience and cyber skills. "Almost every cybersecurity company I know, and other companies like Qualcomm and Sempra, they can't grow their cybersecurity departments because they just don't have enough talent available. Access to CCOE not only gives them access to talent, it gives them the ability to influence the kind of talent coming in."

To begin to address the labor shortcomings that many industry leaders cited, CCOE inventoried the number of cybersecurity-related graduates coming out each year in the region. They worked with 15 higher education entities in the region, as well as industry partners, to assess the talent pipeline and find ways to build it up. These findings were not publicly released, a decision made consciously so that CCOE could ensure they received a candid, accurate assessment.

While they found that community colleges and private institutions like National University in San Diego were providing cybersecurity education, more needed to be done. CCOE worked with local colleges and universities to stand up programs. The University of San Diego and California State University – San Marcos established formal programs in cybersecurity based on CCOE's efforts. CCOE also worked with San Diego State University and the University of California San Diego on their cyber education programs. National University has been a close partner of CCOE and has proven to be successful in retraining mid-career San Diegans and those with former military in particular.

"That really has started to produce the talent that we need," said Pat Sullivan, the former Executive Director of NAVWAR. "It's still in short supply. The growth in demand is like 15 to 20 percent per year in the cybersecurity business, but the talent is not yet growing at that rate. There's still a delta there."

At first CCOE's focus was on seeding the cyber talent pipeline, but lately they have shifted to focus on diversifying the pipeline. Women and minorities continue to make up a small percentage of cyber workers. Not only is the lack of diversity a problem for the industry's ability to fill roles, it is a vulnerability when it comes to cybersecurity. Diversity of thought and background among cybersecurity professionals makes it harder for cybercriminals to deploy social engineering tactics.

CyberHire San Diego, a CCOE partnership with San Diego Workforce Partnership, provides robust support for underrepresented populations in the San Diego region to gain entry into the cyber workforce. CCOE and industry partners helped identify early "feeder" roles in IT and cybersecurity, then worked with education leaders in the region to establish a pipeline of students for those roles. Nearly 200 underrepresented students are currently receiving assistance, from training and credentialing to job placement.

CCOE also partnered with the State of California, Journeys Map and cyber industry leaders to develop the Cyber Career Map, featuring customized career pathways based on the NICE Framework (National Initiative for Cybersecurity Education Workforce Framework for Cybersecurity). Similar to Google Maps, users can create free personalized journeys catering to their skills and interests including education, certifications and work-based learning resources.

Having a leader who herself represents a measure of diversity in a field dominated by men has helped CCOE stay ahead of the curve. "It's nice to see some diversity in our security field. And she's done a phenomenal job of raising the bar," ESET's **Brent McCarty** said. "It goes beyond the borders of San Diego as a mission intended for San Diego. We're having other cities, other regions within the United States reach out for best practices – other countries reaching out for best practices. Lisa's leadership has been outstanding."

Brent McCarty
CEO, ESET

Most recently, CCOE is exploring ways to better incorporate neurodiverse individuals in the cyber workforce. CCOE has partnered with the National Foundation for Autism Research (NFAR) on a new program geared toward individuals with autism. NFAR Cyber is a 9-month Integrated Technical Training Program based on industry standard curriculums; providing students with technical and soft-skills training, work experience, and job search preparation that primes them for careers as an entry level cybersecurity analyst.

Local cyber industry partners on both the commercial and defense side were quick to see

the benefits of adding more neurodiverse workers. Many people with autism share traits that make them uniquely suited to roles in technology or cybersecurity – attention to detail, the ability to hyper-focus, innovative or different thought processes, and the ability to see red flags that others would overlook. NFAR Cyber, based in San Diego County, is currently accepting applicants.

The makeup of the Board of Advisors reflects CCOE's emphasis on including educators in their work. About one-third of the advisors are from academia, with another quarter from government and the remainder from industry. CCOE continues to hold regular events with academia to discuss industry needs and share internship and job opportunities.

KEY TAKEAWAYS

- Members of the association need to see value in order to buy in. In this case, CCOE members appreciated the early focus and progress on workforce development and expanding their customer base.

- Build strong relationships with education partners in the region. The relationship should be built on trust and mutual benefit – education leaders appreciate the opportunity to work with industry to build pipelines to good jobs, just as much as industry appreciates the enhanced labor pool.

Expanded Horizons

Beyond their work on addressing the workforce pipeline, increasingly CCOE is focused on helping all types of businesses in the region become more cybersecure.

Rear Admiral Ken Slaght (USN Ret.), CCOE's first Chairman of the Board and President, was a fan of using an ocean-related analogy to describe one of the beneficial outcomes of CCOE – a rising tide lifts all boats.

Not only was the analogy apt, considering San Diego's deeply ingrained identification with the Pacific Ocean, the Navy, and the San Diego Bay, it also highlighted an unintended but nevertheless critical part of CCOE's success: an effective regional industry accelerator or consortium not only succeeds by addressing the acute problems identified by industry insiders, it creates new connections and an intertwining of the regional economy that benefits the entire economy.

"This isn't always the case for other trade organizations," the San Diego Regional EDC's Mark Cafferty explained. "While trade organizations are founded to support growth in a given industry, some forget to ask the ever-important question, 'In a connected innovation economy, how will this have impact across industries? How can San Diego disrupt this space?'"

"With CCOE, they set these standards from the jump, aiming to have San Diego positioned as 'the most secure city when it comes to cybersecurity.' And they did this with, and through, innovation

economy partners across the region, from defense to communications to nonprofit and education and everything in between," added Cafferty.

Every year, CCOE facilitates multiple briefings for executives in the San Diego region, across key sectors of the economy, about what they can do to become more cybersecure. The FBI conducts the briefing, while CCOE takes on the planning effort.

"CCOE has been about not just education of talent, but education of companies as to why they should pay attention to cybersecurity," Lisa Easterly, CCOE President & CEO, said. "And then if they should have a breach, it's about what they ought to do, not what they could do."

CCOE is now partnering with the City of Carlsbad and City of Vista, both in San Diego County, to provide basic cybersecurity training to small businesses that may be vulnerable to cyber threats at a time when they are also economically impacted by the pandemic. The initial one-year pilot program is targeting up to 500 small businesses and includes an FBI Executive Briefing, Mastercard RiskRecon Cybersecurity Snapshot Reports, ESET Cybersecurity Awareness Employee Training, CyberCatch Cyber Incident Simulator, and connectivity to San Diego's cyber industry at no cost to participants.

"We did have the focus of 'how can we help every sector of the economy secure their information,' from the beginning," Pat Sullivan remembered. "But we were really mostly focused on cyber companies

at the time. Although we had this notion that, if you think of a pie for example, with slices of the economy that we were all supporting, there was a cyber core in each sector. But I believe our thinking on that has evolved a little and I think you'll see that in the representation of the membership."

KEY TAKEAWAYS

- Be a community asset – make yourself useful to stakeholders and they'll support you.

- Building relationships with government partners, at all levels of government, pays dividends.

- Make sure you include all aspects of your community, from business to government to education to nonprofits and civic organizations, and everything in between.

No Longer Considered a 'Zero Sum Game'

When the workforce pipeline was limited and the need among growing cybersecurity firms for workers was great, companies were competing with one another for high-value talent. Today's culture is very different as CCOE members now feel more connected with one another and that they're all rowing in the same direction.

The strengthened connections within and between academia and industry is resulting in an

Design, Scale and Replicate

The San Diego CCOE has been such a standout, they actually worked with the National Institute for Standards and Technology (NIST) to help establish their NICE Framework.

"When they recognized that we were doing something that was unique, they came to us and said, 'hey we need some help with that,'" Pat Sullivan said. "We've hosted and participated in some of their conferences out here on the West Coast, we've red-teamed some of the development of some of their products and curriculum. We've done a career-mapping program where we've mapped the NICE Framework into workforce re-education to support goals like placing transitioning military members."

The San Diego CCOE was one of the first CCOE's in the country. Since their founding, they've helped newer CCOE's around the country with resources, knowledge and best practices to expand the reach of this model and improve cybersecurity across the United States.

San Diego is now home to more than 870 cybersecurity firms, an astonishing number considering the initial 2014 study's estimate of 102 companies. The cyber industry now accounts for more than 24,000 jobs—including 12,400 cybersecurity-specific roles—and has a total economic impact of $3.5 billion annually, up from $1.5 billion in 2014.

increase in the cybersecurity expertise of people and organizations in the region. The cybersecurity workforce, now numbering more than 10,000, benefits from a shared space of training and development, with workers often crossing over between commercial and Federal government entities.

"With respect to innovation, in recent years we ran a series of roundtables with NAVWAR engineers and engineers from commercial entities, and they spent a day brainstorming certain topics, like configuration management," Eric Basu explained. "For NAVWAR, it was exceptional because even though we're right next to each other in San Diego, NAVWAR staff don't get to talk to commercial people about what they're doing in configuration management because we're immersed in it all the time."

KEY TAKEAWAYS

- Mindset matters: with different, sometimes competing, interests all rowing in the same direction, new connections and synergy can be realized. A cross-sectoral feeling of support can result in an expansion of the economic base, lifting everyone up.

Why It Matters

When this effort began in 2014, the primary motivation was to mitigate the effects of impending Defense budget cuts on the local economy. With a clear focus of benefiting the community and building a scalable and sustainable economic engine, San Diego's community leaders were able to initiate a plan that let business take the lead in creating CCOE, an organization that not only supports the cybersecurity sector as a new economic engine but included local education partners, political leaders, and other business sectors.

Local industry, municipalities, government agencies, and individuals have benefited from the work of CCOE. As ransomware and other cyber-attacks become more common, the public is starting to learn of more and more cases where entities are either devastated by the attack or have prepared well enough that they can almost entirely limit the damage.

In 2018, the Port of San Diego was hit with a ransomware attack originating from Iran. As it turned out, the Port was in the middle of upgrades to its cybersecurity systems but had enough in place to limit the damage.

"The port had followed prior FBI guidance with the implementation of strong security practices, including a backup system for electronic information, which enabled us to recover data and not pay the ransom," **Tanya Castaneda**, the Port's former Public Information Officer, told the San Diego Reader in 2019.

The City of San Marcos, in northern San Diego County, was hit with a wide-ranging cyberattack in October 2019. Having invested heavily in cybersecurity awareness and systems, however, the city's internal systems were down for only one day and there was no loss of data or city funds.

That CCOE has achieved a far greater impact – establishing a powerful economic engine in San Diego County while strengthening the cybersecurity posture of business and government across the region – is a testament to the forward-thinking leaders involved and their commitment to cross-sectoral collaboration.

SynED is a non-profit organization that acts as a catalyst to help you help others to improve their lives through education and knowledge and skill acquisition, giving them rich career opportunities. Our team will help you explore the many possibilities and potential solutions available to achieve your desired outcomes.

We seek to facilitate collaboration and communication to find common ground in an increasingly complex and diverse educational ecosystem.

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