Building a Better IEEE CESoc—How to Reinvigorate the Consumer Electronics' Premier Professional Society

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■ **PROFESSIONAL ENGINEERING ORGANIZATIONS** exist to provide their members with services, benefits, networking, training, idea sharing, leadership, and career opportunities. The IEEE Consumer Electronics Society (CESoc) has been doing this since 1983. However, where membership peaked at more than 6,000 in the 1990s, recent years have seen a steady decline—even while the consumer electronics industry itself has expanded massively in size and scope.

That CESoc is not alone—the IEEE Computer Society, the IEEE's biggest professional society, saw even steeper declines over this period and total IEEE membership has also slumped—underscores outside forces at play. Global networking tools such as LinkedIn provide international reach that was once unique to professional societies while platforms that facilitate local meet-ups compete in terms of flexibility and specificity. "It used to be hard to find people in my field to meet with locally," says one US engineer. "That's not a problem today."

Our research team of MBA students led by Matt Swatzell, with MIT faculty advisement from Sharmila C. Chatterjee, and IEEE CESoc liaison support from L. Dennis Shapiro, was commissioned by CESoc leadership to investigate these trends (team pictured in Figure 1). We believe the Society has a value proposition greater than any of these alternatives for consumer electronics engineers—through its publications, conferences, standards-setting abilities, educational offerings, training expertise, and, most importantly, community. However, this is not communicated well; moreover, it needs a significant refresh to remain relevant. We conducted more than 150 in-depth interviews with members and nonmembers which support this conclusion, and which have helped

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Figure 1. Left to right: CESoc Liaison L. Dennis Shapiro, Bao Di, Matt Swatzell, Protik Kotangale, Richard Oxland, CESoc Board Member Narisa Nan Chu.

us to develop a plan for reinvigorating an organization that could be, and should be, a meeting place that matches the vitality of the field it represents (see Figure 2 for a summary of these findings).

WHO ARE WE, ANYWAY?

It used to be easy to identify devices that qualified as consumer electronics—the television, the answering machine, the video games console. But as a passion for HiFi became one for WiFi, the worlds of consumer electronics, computing, and communications began to overlap and merge. The definition of a consumer electronics device now encompasses everything from personal computers to watches, drones, smart washing machines, energy meters, and a good portion of your car's dashboard. Likewise, whereas it was once easy for a consumer-electronics engineer to determine why she would want to be a member of CESoc, today someone building mobile phones could just as reasonably join a communications or computing society. A handful will join all three, but our interviews suggest most people choose the organization most closely related to their granular, day-to-day work. And that organization is rarely CESoc.

Why should it be otherwise? We found even highly engaged CESoc members had trouble articulating an answer; moreover, ideas about mission and purpose varied significantly, suggesting there is little consensus across members of different longevity, from different geographies, or working in different parts of the field. Less engaged members were often unaware of key CESoc programs and benefits, and therefore saw little reason to maintain their membership. Others had only signed on because membership came free with conference registration.

One US interviewee captured a worryingly common sentiment when he told us, "I guess I just forgot to cancel." Over the course of 14 months of research, it became clear that the CESoc needs to find a niche in order to have any meaning at all. But how?

IVORY TOWER, US ZIP CODE

The question is complicated by interview partners who felt there are areas in which the Society needs to broaden its ambit rather than narrow it. Many people perceived CESoc as being overly scholarly, "just academics talking to academics—not at all relevant to my day-to-day work," in the words of an American engineer.

Nor was this grievance voiced only by those working in industry; academic researchers, particularly in Europe, craved a forum in which they could find industry partners interested in practical commercial implementations of their research. CESoc, they said, is not currently that forum. A lack of industry involvement degrades value across nearly all members. It also saps the organization of funding, since nonengaged companies

Summary of Key Findings	
Insufficient Awareness	1. Lack of brand awareness outside of CESoc membership 2. Uncertainty around society's purpose and mission 3. Insufficient knowledge of Senior Member and Fellows program
Missing Value	1. Active questioning of value in CESoc membership 2. Lack of relevant, applicable content and meeting topics 3. Unmet desire for access to collaborators and increased industry collaboration 4. Concern that benefits are concentrated on U.S. membership 5. Disappointment with impact of flagship conferences 6. Interest in increased professional certification capabilities 7. Price perception as overly high for value provided
Demographic Issues	1. Incorrect balance of industry and academic membership 2. Lack of female membership and representation in leadership 3. Lack of engagement among US academics 4. Differences in membership longevity by background 5. Small chapter size in smaller countries reducing effectiveness
Changing Preferences	1. Decreased interest in professional societies overall 2. Increased competition from other professional organizations 3. Decreasing student engagement 4. Perception of CESoc as overly academic

Figure 2. Observed rationale for declining membership.

are less likely to cover membership fees for their employees.

If academic was seen as the profession dominating CESoc, Americans—or rather, US -based members—were the nationality seen by many interviewees as the Society's priority, creating discontent in South and East Asian chapters. This sense of bias damps engagement outside the US, which turns the perception of an outsized role for US members into a reality. But, international feedback has been invaluable, suggesting practical ways in which CESoc can meet the needs of its global membership (including a re-structure of membership fees), underscoring the importance of tone (might CESoc consider translating some of its publications into local languages?), and demonstrating the benefits of encouraging change from the ground (or local chapter) up. "One important task for CESoc in Asia is to expand its member base," said an interviewee from China. "One effective way [would be] to bring industry leaders inside who are open and have many followers." This is true in China, but elsewhere, too—and could help counterbalance academia's influence.

While academics and Americans are seen as dominating CESoc, in fact, US academics are less likely than international peers to be members of the Society and, in particular, to submit papers to its conferences or journals. Rather than a frustrating paradox, we see this as a positive sign— that participation in CESoc is not a zero-sum game, where, say, greater US academic engagement depresses European industry participation, but rather a virtuous circle, where the more people involved, the better the experience for everyone.

A COMMON MISSION

In our interviews, a surprising number of people mentioned a pair of articles published in the IEEE Consumer Electronics Magazine (MCE) in 2013 tracing the history of color television, from engineering problem ("How do you fit 10 lbs of stuff in a 5-lb bag?") through to psychophysical, regulatory, and commercial challenges, and landing at the era-changing system that was the NTSC color TV standard.

The articles seem to have struck a chord as a reminder that consumer electronics are defined not by their components but by the roles they play in users' lives—and that working in consumer electronics is not just about applying knowledge from a wide range of fields to engineering problems, but about doing so in the context of politics, business, and social

Summary of Recommendations						
Category	Recommendation	Findings Addressed				
		Insufficient Awareness	Missing Value	Demographic Issues	Changing Preferences	
Branding	1. Follow multi-step process to develop a new mission and corresponding branding program	🔍	💰	●	♻	
Management Policies	1. Develop and actively manage online presence (Website, Twitter, Facebook, Instagram, etc)	🔍			♻	
	2. Cease providing membership as free benefit of conference registration		💰	●		
	3. Utilize IEEE developed society and chapter membership development tools	🔍		●		
	4. Provide localized translations of CESoc produced materials	🔍	💰	●	♻	
	5. Announce and promote CESoc events through non-IEEE avenues (meetup.com, etc.)	🔍		●	♻	
	6. Better promote key-performance metrics and goals for local chapter growth	🔍		●		
	7. Revise membership pricing structure to better match willingness to pay of market		💰			
New Programming	1. Introduce new industry partnership programs through Hackathons and related programming	🔍	💰	●	♻	
	2. Increase proportion of "hands-on" style workshops	🔍	💰	●	♻	
	3. Increase prevalence and promotion of Senior Member and Fellows Training programs	🔍		●		
	4. Introduce new career mentorship program		💰	●		
	5. Develop continuing professional development roadmap for members	🔍	💰	●		
	6. Differentiate online streaming content and functionality between members and non-members	🔍	💰			
	7. Facilitate and Develop Increased local and student leaders training	🔍		●		
	8. Develop increased collaboration tools for researchers working across countries		💰			
Region Specific	United States — Introduce new programming to increase prevalence of female membership leadership	🔍	💰	●		
	China/Japan — Increase engagement with non-IEEE consumer electronics conferences	🔍		●		
	China/Japan — Introduce localized social media campaigns	🔍		●	♻	
	India — Introduce fellow pre-assessment process	🔍	💰			
	India — Launch partnership with Flagship Universities	🔍		●		
	Europe — Seek to integrate and merge country based chapters to build critical membership mass	🔍	💰	●	♻	
	Europe — Expand size and scope of ICCE Berlin	🔍	💰			

Figure 3. Overview of recommended actions.

trends. This insight led us to a concept of CESoc that rises above the tangle of specialties currently feeding the consumer electronics field. We urged CESoc leadership to consider moving toward a mission statement that touches on how technologies can be integrated, produced, and brought to market effectively. As a starting point, we suggested "Bringing Consumer Electronics to Life." The concept pulls together many threads of CESoc that members find most enjoyable, including high-level information on cutting-edge technologies; best practices for integrating complex technologies; product, project, and engineering management; user-focused design; and basic business and management principles. While other societies focus on elements of this chain, only CESoc would run its entire length. Instead of the broadness of the consumer electronics industry being a barrier to the Society's success, it would become a key to its future.

The idea resonates with multiple stakeholders. Industry-based members like its emphasis on the way products are brought to market. Students preparing to cross the bridge from theory to practice appreciate a society that embraces both. And, researchers see how CESoc's flagship titles could become go-to destinations for work that probes the influence of the consumer market on technology.

VALUE IN ENGAGEMENT

CESoc's Board responded enthusiastically to these arguments but also wanted to ensure that any new direction for the organization would chime with the Society's mission. They arrived at a mission statement that expands the umbrella of CESoc and begins to define the organization as one focused on the exchange of ideas across disciplines. It reads: "*To be the leading forum for the exchange of engineering and scientific information on advancements in consumer technologies and the professional development of its members.*"

There are, of course, many steps from a new mission statement to a revitalized Society (See Figure 3 for a summary of these recommended steps). What each step should have in common, we believe, is a focus on engagement: our research showed that individuals who were most involved at the member level were less likely to be concerned about the value of the membership.

There are some relatively quick and straightforward ways to boost engagement. Maintaining an up-to-date and geographically tailored web and social media presence should engage potential new members, particularly from younger generations. Ending the coupling of conference registration and free membership should weed out disinterested parties (and has already been implemented). Adopting tested recruitment

tools should empower local chapters to grow, including adapting more relevant growth targets. Revising the membership fees structure, with cuts to student fees and fees in lower income geographies, should boost value perceptions. The Board is moving forward, but we emphasize the need for quick action.

Other changes require more time and consideration but are essential to any sustained turnaround. Where the quick fixes address the member pipeline, deeper adjustments would seek to incentivize members to stay. For example, introducing a mentorship program might help address an underrepresentation of women in senior positions and locally, and stem female flight to other engineering groups. The signature Fellows program and its precursor, the Senior Member program, are little understood by the average CESoc member, but once explained elicited excitement among interviewees. An additional leadership development program might serve the dual purpose of invigorating local chapters and engaging young and ambitious members. A professional development roadmap would help channel CESoc expertise into the career growth of members. Making benefits and courses exclusively available to members would underscore the logic of membership.

Two additional changes take a head-on approach to international and industry engagement. The first would be collaboration tools for researchers working across borders, and an online matching platform to connect researchers with industrial commercialization opportunities. The second stems directly from the new mission statement. CESoc training sessions, lectures, and online presentations were sometimes seen as out of touch with the needs and interests of members. Here, we suggest a shift from academic to more hands-on workshops, and even CESoc hackathons, in which teams work to solve interesting problems in a set place and in a set time. These events are popular in software development and would build bridges to both companies, which might choose the problems or sponsor the events, and students, who might help plan events or get involved for cash prizes and recognition.

CESoc's members and potential members lead busy lives, and the Society will only thrive if it can enrich those lives—by connecting people, inspiring ideas, and enabling learning and creation relevant in today's dynamic consumer electronics space.

NEXT STEPS—FOR LEADERSHIP AND MEMBERS

The consumer electronics field deserves a professional society that reflects its particular vitality. CESoc is well positioned to be that organization, but needs to refocus its resources, including the enthusiasm and expertise of members. To move ahead with sure footing, however, the leadership needs feedback from members. We invite you to offer this urgently by emailing to CESoc President.

What would a turnaround of CESoc look like? We envisage not only a bigger, more engaged member base, but expanded standards-setting responsibilities, a stronger thought leadership role, and more benefits for individuals. The extent to which our specific recommendations, and CESoc's adapted versions of these strategies, lead to such a vision merits careful observation: CESoc's efforts might also serve as a model for other professional societies.

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