



Special Technical Communities: A 10-Year Retrospective

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Computer hosts a virtual roundtable with four past IEEE Computer Society presidents to discuss the original rationale for creating special technical communities and their future.

Approximately 10 years ago, the four authors of this article (see “Roundtable Panelists”) realized the need to improve the way how the IEEE Computer Society (CS) members organize. Incidentally or as a consequence, this was just prior to the four of them becoming consecutive presidents of the CS (2011–2014). Working closely together, they conceived what are today known as *special technical communities* (STCs). During their presidencies, they formalized the STCs and recruited the first instances. You can read the rest of the story in this virtual roundtable panel session.

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COMPUTER: Professional societies are well known for publications and conferences. What is the importance of membership in societies and in IEEE as a whole?

DAVID ALAN GRIER: In the grand picture, of course, you are helping to sustain a body of knowledge. Professional societies define and sustain bodies of knowledge. They are the organizations that say what is true about a body of knowledge and what is not. In computer science (and

computer engineering), that has been a little problematic. First, almost anything related to computing falls under “computer science,” and, second, the body of computing professionals is very broad.

For me, the big benefit of belonging to the CS has always been the periodicals. I read them as a student. I read them as a young professional. I joined IEEE to be able to volunteer to work for them. They have been at the core of my career.

DEJAN MILOJICIC: There are two views of membership. One is external; the other is internal to running the CS. From an external standpoint, membership is important, as it provides benefits to members as well as a sense of

ROUNDTABLE PANELISTS

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belonging to an organization—for personal growth and networking. A lot of benefits might be achieved without membership, but those are amplified with membership and a sense of belonging and growth, often through attaining leadership positions.

In terms of my internal perspective, as the 2014 president of the CS, I spent most of the time and effort on publications and conferences. They brought the most value to members and also revenue to run the Society (staff, IT, legal, and so on). I noticed a similar pattern during other years of my tenure on the CS Board of Governors (BoG) (2012–2018). Membership and geographical activities never got as much attention as publications and conferences, which had tangible outcomes around which volunteers (active members) gathered.

Publications were organized mostly around editorial boards, and they had a very strong link to IEEE's “mother” organizations. Conferences were very impactful in terms of the value they created and revenues they generated, but they were much less organized because of the more transient nature of their steering and program committees. The exceptions to this were some of the largest conferences, such as the ACM/IEEE SC Conference (originally called Supercomputing), IEEE/Computer Vision Foundation Computer Vision and Pattern Recognition, and the IEEE International Conference on Computer Vision.

Membership itself was always important, and we tracked how many members the CS had. However, membership brought very little revenue

despite our concerted efforts because of the dominant cost of the IEEE portion of the membership compared to the CS part. In retrospect, that probably has to do with their multitier membership model [IEEE membership, Society membership, and technical committee (TC) membership], lack of tangible products, and dual reporting of Chapters into Societies and Sections, which are governed by the IEEE Membership and Geographic Activities (MGA) Board and Regions. (See also the answer to the next question.)

SOREL REISMAN: Membership in IEEE and the Societies enables members to participate in communities of practice specific to their fields of interest, both locally and with folks from around the world. Most people who don't belong to

a professional society mainly interact with colleagues at their own place of work. Participation in local IEEE Chapters provides members with an even broader network of colleagues in their local geographic area. IEEE, being an international organization, exposes members to colleagues in international locations—people and places that would normally be inaccessible to them.

JOHN WALZ: Technologies have a lifecycle, from concept; to research; to deployment, with patents, standards, and public policy; and, finally, to either being repurposed or sunset. Societies can learn from members who work in these lifecycle phases—to change the course of the lifecycle by discovering “pain points,” leading to novelty and effective solutions; setting priorities for “road maps”; and working synergies with related technologies.

Heathy professional societies attract diverse technical people interested and engaged in different parts of the technology lifecycle, allowing the society to provide value to its members, resulting in member contributions back to the professional society. Even the elite Mensa, the high-IQ society, seeks new members.

COMPUTER: What are the key organizational entities in the CS? Can you compare them to other professional organizations?

WALZ: Let me go first on this one. There are five program boards in the CS: the Publications (Pubs), Technical and Conference Activities, Standards Activities, Professional and Educational Activities (PEAB), and MGA. There are also a number of standing committees, such as Awards, Fellows, and History, and operational ones, such as Audit, Constitution and By-laws, Finance, Nominations, and so on. This is somewhat similar to IEEE's.

IEEE itself has activities called *New Initiatives* that create communities across their own equivalent boards—Standards, Education, Technical, and Geographic membership. Within

Technical Activities, there is something called *Future Directions*, whose initiatives are created and sponsored by multiple Societies. Government funders grant awards for difficult problems requiring multiple technologies for solutions. The CS has organization strengths compared to other technical professional organizations, which include our corporate connections and their involvement in our standards-related activities as well as professional and continuing education. In some ways, the creation and now existence of our STCs serve the same purpose for the CS as IEEE's *Future Directions* initiatives (FDIs) and road maps do for all Societies.

GRIER: I find it useful to compare the CS with the different computer societies around the world. If you look at organizations such as the Association for Computing Machinery (ACM), British Computing Society, Indian Computer Society (ICS), and Chinese Computing Federation (CCF), you find that they all have a lot in common. All have a membership committee—a group that can decide who is acceptable and who is not. Most have a conference committee, though many, such as ICS or CCF, host only one conference a year. Many have a publications committee, with the CS, ACM, and ICS publications committees being academic/research based. Most have a strong educational committee, though these are usually more focused on professional than on academic education.

It's interesting to note that when UNESCO started promoting the idea of computer societies in the late 1950s, it argued that the education of the workforce was the principal task of a computer society. The CS is one of the very few professional computer societies that has a standards committee, though in most countries, standard making is more closely tied to the government than it is in the United States.

MILOJICIC: As John noted, IEEE has equivalent major boards to those of

the CS, but it also has IEEE-USA, which represents the six U.S. geographic regions. (Note that IEEE has “divided the world” into a total of 10 regions.) In many ways, IEEE's organization is one level higher than the CS's. An interesting relationship is with Chapters, which have “dual reporting.” On one hand, they report to Societies, and, on the other hand, they report to Sections, which roll up into IEEE-level regions.

ACM has a similar organization to ours, although it's flatter. ACM's collection of special interest groups (SIGs) is similar to the CS committees. Another related major professional organization is USENIX, which has limited itself to organizing conferences, having exited its publications business. USENIX is an entirely flat organization with its board of directors and officers. There are other professional organizations, such as the American Association for Artificial Intelligence (AI) or The Optical Society, but a comparison with them is beyond the scope of this roundtable. Internationally, there are corresponding national professional organizations that include the Information Processing Society of Japan, CCF (China), the Computer Security Institute (India), the Korean Institute of Information Scientists and Engineers, and so on.

In summary, organizational entities that dealt with smaller numbers of focused products were always better organized and more effective. For example, there are a few hundred journals at the IEEE level versus 2,000 conferences. In addition, a simpler organizational structure without dual reporting was always more effective.

REISMAN: Aside from the formal CS and IEEE committee and board structures, we have informal categories of membership focus and programs to address them. It's like a matrix support structure. The verticals are our various boards and committees, and the horizontals are our membership types. Primarily, we have academic members looking to advance their

research programs and practitioner members wishing to advance their careers. Of course, we address other industry segments as well, such as government, but significant program emphasis focuses on academics and practitioners. We also have programs targeting our students, such as Eta Kappa Nu—the student honor society.

For the academic side, we have board- and committee-driven publications, conferences, STCs, and so on, which provide forums for members to share/learn about the research of their academic colleagues. Young professionals tend to be “practitioners,” and we have many local Section and Chapter activities where they can meet other professional colleagues and learn about local career and other business opportunities. Unlike the “real world,” in IEEE, there is a lot of crossover among these “categories,” and this benefits everybody.

COMPUTER: What has led to formation of STCs?

GRIER: I cannot claim to be the instigator, though I believe that I was in the room when the idea was developed. There were a number of us who felt that the CS was getting too rigid and fixed in its ways. It was missing important trends (such as the cloud and mobile cloud) and was suffering from having too many groups that were able to block new developments.

MILOJICIC: There were several factors that led a few of us at that time to decide to form a new entity, which we eventually called STCs. The first factor was the stagnation of TCs, which were performing a role similar to that which STCs were introduced to do. There existed a few dozen TCs, but a lot of them were not active, and there were very few newly formed ones. In fact, to form a new one required a lengthy process of forming a task force and eventually transitioning into a TC—provided that the TC governance team approved.

We (the STC organizers) all felt that there was a need for more agile and nimble entities that could be quickly formed, evaluated, and grown (or dissolved), subject to their progress. TCs took much more time to create and years to dissolve. (See also our answers to the question about how STCs relate to other entities.) At the same time, social media was becoming popular, but the TCs did not embrace this. Our intent was to have new STCs fostered from their creation to fully embrace social media.

Finally, we felt that siloed organizational units within the CS and some of the entrenched TCs’ governance processes could not be easily changed to create new entities. STCs were created to cross these boundaries.

REISMAN: This is an interesting question, at least for me. In my mind, over the years, I’ve felt that I invented the concept in the CS, but this question has forced me to consider the details of that claim. Probably all of my colleagues on this panel who came together to create STCs have their own similar background story on this question. That’s also probably why, all of us being of one mind, we were able together to pull off the creation of STCs. But I will answer this from my own perspective.

Many years ago, when I was chair of the CS Pubs Board’s Magazines Operations Committee, I was exposed, for the first time, to all of the different CS-published magazines. Until then, I, like most members, only saw the ones I subscribed to—*Computer* of course, *IEEE Software*, and the two I helped launch—*IT Professional* and *IEEE MultiMedia*. It was then that I saw that there were many articles in the other magazines that interested me—for example, articles about education, information systems, and multimedia. It chagrined me that I or other members wouldn’t know about those kinds of articles without paying for full subscriptions to those magazines.

Later, when I was a member and eventually vice president of the now-

defunct Electronic Products and Services Board (EPSB—an acronym that almost everyone misspelled!)—I proposed that we create an online subscription-based product based on a matrix structure of content, with magazine titles as rows and themes common to those titles as columns. All of our magazines had articles from time to time and even regularly, for example, about education, security, networking, storage, and so on. Why not create and “sell” subscriptions to the columns in the matrix?

While I was a member of that board, I was also on one of its committees responsible for redesigning a new CS website. This was also the time when we wrung our hands over how to present customized CS websites based on members’ specific interests as well as on data captured in their membership profiles. This personalized website concept was very in vogue at the time.

I thought it would be great if we could somehow operationalize the content-matrix concept in a personalized website construct. The idea was that, when you opened <https://www.computer.org>, it would recognize you and present you with content specific to your interests, including access to magazine content from the columns of that matrix. In some ways, it was meant to extend the CS online news service, *Computing Now*, concept that was originated and implemented by Dejan but taking it to the next level. However, for many reasons, mostly related to the inaccessibility of differing data types located in varying places, not to mention implementation costs, the idea of personalized renditions of <https://www.computer.org> was dropped, and the CS focused simply on the never-ending activity of web redesign.

However, the challenge remained regarding how to address more informal, technology-specific requirements outside of the TC framework. With so much emphasis, at the time, on online stuff, we thought, “How about inventing online groups for

each of those columns in the matrix”? Well, one thing led to the next. Why stop with providing a community with published magazine content? Why not give them a voice with online discussion tools? Why not try to use these structures to solicit new members? Why not use the structures to provide their supporters with opportunities to create new intellectual property (IP)—with new online publications, conferences, and so on. The possibilities were truly endless. All of that led to the invention of STCs.

By the way, I think it’s interesting to note that the matrix concept morphed into something a bit different from what I had proposed. During a period of volunteer and staff turmoil, the CS decided to produce the publication *IEEE Computing Edge*. In some ways, *IEEE Computing Edge* does address the matrix-column concept—not very well, but well enough, it seems. Also, *IEEE Computing Edge* fulfills some other needs of the Society, especially as an employment advertisement revenue source.

WALZ: As 2012 president of the CS, I recognized the CS had too much underserved “white space” in its “field of interest” across the technology lifecycle phases. Our 30-plus TCs were active in only a portion of the Society’s potential fields of interest. Our large profession had many current and potential members working in these “white space” holes and were not being served by the CS. We wanted to create a structure into which we could recruit those

potential members—hence, the invention of STCs!

IEEE is rich with sales of IP products, and it shares some of its net proceeds from those products with the committees that organize the IP creation. This has resulted in little sharing of funds among committees that claim ownership of broad stripes of technology domains. The “pie of technologies” had been set, and there was no more room at the table for future “slices.” As technologies changed or were bypassed by new technologies, these strict technology domains were withering away.

STCs are formed without the constraints of strict technology domain ownership and with no threat to existing IP funding structures and practices. These STCs could grow in the “white space” not “owned” by existing IEEE or CS entities, and they could expand with new members who can govern as they see fit.

COMPUTER: In your own words, how do you define STCs?

GRIER: They are flexible groups that could collaborate to develop a new technical topic or body of knowledge that would be of interest to the CS. From my perspective, there were two factors important to me. First, we defined *technical* very broadly. We wanted committees that might look at topics related to computing (such as economic or social impact), and we wanted committees that might be defined by geographic or institutional factors—a regional group looking at pattern recognition, for example, or a group of computer engineers in the automotive or aerospace industry.

One of the elements for which I advocated was the “no scope monopoly” policy. No STC (or TC for that matter) could block the formation of a new STC because its scope overlapped with that of another entity. “By their fruits ye shall know them,” to quote the prophet. I felt that any group should succeed or fail because of what it did. We shouldn’t block a new group

because it was looking at a problem that was in the domain of some other group. This was a hard-fought battle with the typical lines in bureaucratic debates. I feel that I won the battle (with plenty of scars for all) but may have lost the war.

MILOJICIC: We spent a lot of time deciding on the name, as the name already defines the entity on the first encounter—the first time someone hears about STCs. We were addressing communities of people, so we started from this element in the name: “Community.” We wanted to be sure that everyone understands that STCs deal with technical problems; therefore, “Technical” is in the name. Finally, their missions are very focused in nature; hence, “Special.” “Special” is related to the knowledge “created.”

We strongly believed that these three aspects are closely intertwined, and, therefore, we drew a picture to represent STCs (see Figure 1) to be very explicit that they are about knowledge, technology, and people. Furthermore, our intent was to support gradual growth of the STCs by providing resources to them, proportional to the impact they might be making (see Figure 2). This had been described in detail by Milojicic and Laplante,¹ who led the Electronic Products and Services Committee, under which STCs were governed initially before transitioning to MGA in 2014.

REISMAN: An STC is an online-only “SIG”—a community of like-minded individuals who share an interest, personal or professional, especially in the context of the CS, in some aspect of computer technology. In fact, I had originally proposed calling them SIGs, like ACM does. However, my colleagues on this panel objected, especially because that’s what ACM calls their “equivalent.”

Aside from being online, a critical difference between STCs and SIGs is that SIGs are much more “formal” in their structure, governance, and operation. Within the CS, by comparison, STC governance is “semi-formal.” SIGs are the basic governance



FIGURE 1. The three aspects of STCs: special—focused knowledge, technical—IEEE mission and purpose, and community—people within and outside the larger CS and IEEE.

infrastructure of ACM. STCs aren't—nor were they meant to be—so critical to the governance infrastructure of the CS. Also, STCs, once formed, don't have to exist forever. In fact, an STC should only continue to exist if its members want to continue to support it. This is unlike IEEE or CS entities that, once formed, seem to be impossible to terminate, regardless of how obvious it is that they should be. Also, STCs are free to join, and participants don't have to be IEEE or CS members.

WALZ: By design, an STC has a lightweight governance for easy start-up and sunset. STC attributes include

- › an informal technical community with scope, goals, and executive officers
- › a “franchise” within the CS infrastructure
- › the fact that no one could have vetoed their scope when they were created
- › founders who recruit their members, contributors, and experts
- › members who discover unmet needs that can be defined and prioritized for the design and deployment of future products and services to benefit the STC and larger Society
- › a growth strategy
- › achievable goals to make progress and determine whether to continue or be sunset.

COMPUTER: From your perspective, have they justified their introduction? Does the need for STCs still exist today?

GRIER: I would think so. If you look at how computer science has developed, it settled on a fixed set of topics by the early 1970s. Graphics, AI, computer architecture, software engineering, and so on were all in place by 1975. However, all of these fields have changed radically over time as well as developed new techniques and questions for research.

AI is the most obvious example. The AI of the 1970s was rule based.

Our current approach is dominated by deep learning. To move from one approach to the other requires a flexible organization, one that can look to the future without worrying about how it will offend current practices. STCs give the CS that kind of capability.

MILOJICIC: Having directly defined and led the formation of the concept of STCs, I am in a position to be biased, so I will try to be as objective as possible. When I look at the list of STCs versus the list of TCs on <https://www.computer.org>, the CS's webpage, I see 21 STCs and 30 TCs. TCs existed for many more decades than STCs and STCs for under one decade. Therefore, from a pure numbers standpoint, they have justified their creation. They have also shaken the dormant organization of TCs, and that helped revitalize the whole CS Technical and Conferences Activities Board. In addition, they heavily relied on social media, which has helped spread that strategy across the rest of the CS.

However, they have not yet achieved our full vision (see Figure 2), and that may take more time, if ever. They have also not achieved the levels of revenue and the value generation we had planned. At the same time, at the IEEE level, a similar approach has been taken

with the IEEE Future Direction initiatives, lightweight entities compared to heavyweight IEEE Societies and councils, which are similar to the CS's TCs across multiple Societies.

Like any other organizational structure, STCs must be periodically re-evaluated. Circumstances change all the time. There are some massive tectonic shifts that influence professional organizations. For example, the open access model has heavily influenced journals by switching IEEE's emphasis from subscription to author-prepay models. Similarly, COVID-19 has influenced IEEE's conferences, turning them exclusively virtual instead of in person. In the transition to post-COVID-19, a hybrid model may reappear, but we envision that virtual events are here to stay, together with the traditional, in-person events.

Over the course of time, many changes have taken place in the CS. For example, the Electronic Products and Services Committee (and, prior to that, the board with the same name) was not necessary anymore, and it was terminated. Also, the CS merged the Professional and Education Boards into a single one. The same is true in external organizations, such as USENIX, which exited publications and only retained conferences as its primary focus.

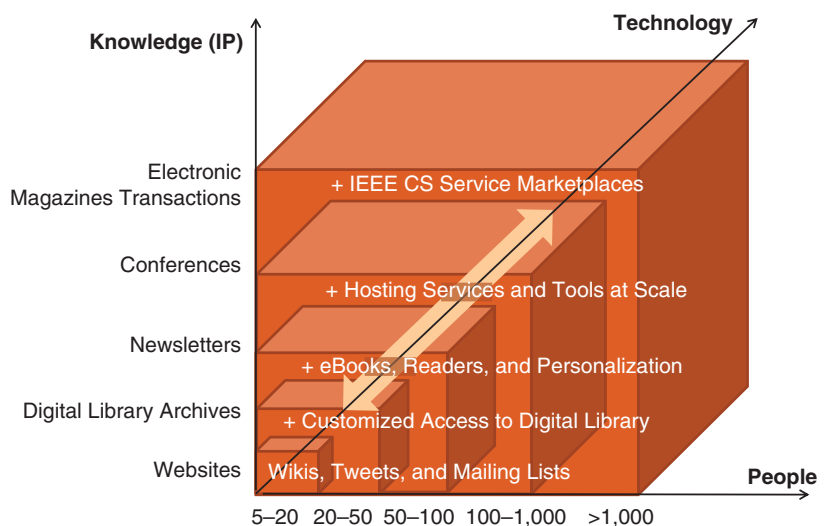


FIGURE 2. The intended growth of STCs.

Therefore, we expected future leaders of the CS to continuously evaluate the relevance of all of its entities and act accordingly. However, I truly believe that the need for the support that STCs provide and are expected to provide will continue to exist for a long time.

REISMAN: There is no question about their need. When the CS was first formed, the science of computing was very specialized and could be “centralized” in a single entity, such as the CS. As computing broadened, CS TCs were created to address the expansion of the field. Today, the equivalents of CS TCs can be found in most of IEEE’s other Societies because computing is so pervasive to almost all IEEE fields of interest. This phenomenon continues to increase; STCs enable smaller computing interest groups to seed, grow, and become whatever they become—either more mature STCs, new CS STCs, or even core groups in other IEEE Societies. They are a place to germinate new professional and technical communities of collaboration.

WALZ: Yes, as computing has engaged so many formal technologies over time, many technical professionals, educators, researchers, and experts need to partner with the CS. Other IEEE Societies have created their own TCs on various computing topics, either because those topics don’t already exist as fields of interest in IEEE or because they don’t know that the CS already has a structure to address them. This confuses new and potential members about whether to join the CS or another Society that either also addresses that technical topic or intends to create its own structure to do that. Partnerships between those “overlapping” Societies and the CS make more sense than creating new TCs. We have done that with the Systems Engineering STC, which works together with the IEEE Systems Council.

COMPUTER: What was the impact of STCs on the CS? Was there any impact broader than the CS?

GRIER: I think that the biggest impact was that it prepared the leadership for what was to come. It taught the leadership that we would need to be flexible in the future. When the budget crisis finally came, the leadership was at least slightly prepared.

MILOJICIC: STCs enabled the quick creation of groups of like-minded people in a narrow technical area. These groups are lightweight in the process, enabling rapid evaluation of how an area is important and whether a community is ready to embark on developing it as a CS entity. It enabled an independent experiment in the organization of volunteers without much overhead to its leadership. It also effectively elevated the introduction of social media into the CS, which was then embraced by the staff and other volunteers.

At the IEEE level, we have shared our experience with the Future Directions Committee, which had, in parallel, started creating similar entities, called FDIs; these have been quite successful. Some of these initiatives transitioned to STCs, such as cloud computing. More recently, there is an attempt between two major IEEE boards, the MGA Board and Technical Activities Board (TAB), to form local groups, similar in concept to STCs.

REISMAN: Probably the most notable thing has been enabling the quick creation of technical communities in areas not already covered by the CS TCs. This enabled Future Directions, as others have mentioned, to find STC homes for some of its initiatives once those initiatives’ funding from IEEE was terminated. Cloud computing is the most obvious example. That initiative became a CS STC online community with publications and conferences.

WALZ: The CS has become nimbler about “setting up shop” to consider emerging ideas. For example, there appears to be less conflict between the TCs regarding cosponsored conferences. STCs have attracted new leaders, contributors, and website visitors. Some STCs have partnered with other associations, such as

ACM, and have gone outside of IEEE to “publish” their work.

As some of the other panelists have mentioned, in the broader picture, CS leaders have guided the formation of the IEEE FDIs, which have graduated to Future Directions TCs, sponsored by several Societies, including the CS. Now it’s time, I think, to encourage all of the CS program boards to experiment with creating STCs across two or more program boards.

The CS should work with other Societies and major IEEE boards on future directions or new initiatives to organize our own members into “shadow” STCs. With our access to our own strong assets and leadership, CS “shadow” STCs should have a strong influence on such IEEE communities.

COMPUTER: If you would do them all over, what would you do differently?

GRIER: If I had the opportunity and political skills? Integrate them more closely with TCs—in effect, make it harder to distinguish between the two. Too many TCs were no longer engaged in interesting topics and would have benefited from the sunshine provisions of STCs. That goal was beyond me and perhaps anyone.

MILOJICIC: If I would do STCs all over again, I would do three things differently. First, I would make STCs financially sustainable up front. As an IEEE president in 2014 I did not do it immediately because I was almost totally focused on the overall finances of the CS. The ability to generate revenue is critical for any entity’s survival. This is one of the reasons why one of the STCs requested turning into TC—to share or generate its own sustaining revenue.

Second, I would make sure that they have the products and services necessary for their operation. This is much easier now than it was in the past, as free or low-cost services are available from Google, WordPress, and so on.

Third, I would integrate STCs more closely with TCs and boards outside

of the MGA Board—such as the TAB, Standards Board, and Professional and Educational Activities Board. This increased cross-organization collaboration could be mutually beneficial. Finally, more engagement with IEEE's Future Directions Committee could help both STCs and Future Directions Committee. This was one of the reasons why I moved STCs to report to the MGA Board when I was CS president in 2014.

REISMAN: One thing I would do, which I sometimes wish I had done at the time, is retain leadership of the STCs until I felt they were ready for “prime time.” Because of my other personal commitments—work, family, and new CS president-elect—I simply couldn't do it all and, at the same time, oversee the launch of STCs. Therefore, I had to leave that to others. (Also, as a James Bond fan, I subscribe to the philosophy that “nobody does it better.”)

Another thing I would do is select and declare a standard, common community-building tool be used by all STCs. I don't think we had enough knowledge at the time to realize that we needed such a standard; I am not sure that there were that many good ones to select from back then. Therefore, we wound up letting each new STC choose whatever system it wanted; the CS itself chose Liferay, which, at the end of the day, was an expensive, convoluted system that really didn't facilitate the process of going online for STCs that really didn't know how to do it.

In any case, STCs were meant to be a temporary haven for nonperforming TCs and for TCs that felt burdened by what some perceived as irrelevant CS policy. Unfortunately, there now seems to be a tendency for successful STCs to want to become TCs. When or if that happens, STCs lose the flexibility they need to be innovative with respect to their governance and supporting programs. I had hoped that STCs would flourish at the expense of TCs.

WALZ: The presidents should have seeded some STCs to start working among various program boards, such as

- › the Software Architecture Description Standard Committee with the TC on Software Engineering (TCSE)
- › the IT in Practice Symposium with *IT Professional*
- › the International Conference on Learning and Teaching in Computing and Engineering organizers with the CS PEAB
- › the PEAB cybercurriculum with the TCSE
- › the Life Sciences Technical Community with the TC on Computational Life Sciences
- › using long-standing conferences to create their STCs for authors and attendees for a “365-day” community.

Finally, STCs should have to provide an annual report to the BoG, where future STC leaders can be recruited. This would also give STCs more visibility in the CS.

COMPUTER: How do STCs relate to other entities (task forces, TCs, and technical councils)?

GRIER: Task forces are a form of ad hoc committee and are dependent on the immediate leadership. STCs can survive the current leadership. TCs are a much larger, much more formal organizational structure. They also have more permanent relationships with things like conferences. Technical councils are an IEEE concept, not a CS concept (unless things have changed) and generally regarded as a stepping stone toward creating a Society or a means for cooperation among Societies.

MILOJICIC: There is an old saying that a picture is worth a thousand words. Something similar is true for tables. I have created a table (see Table 1) and a figure (see Figure 3) to compare the various approaches to organizing technical activities within the CS.

While both Table 1 and Figure 3 are self-explanatory, it is worth mentioning that there were examples of transitions of STCs to TCs and vice versa. The TC on Operating Systems became an STC, and

the STC on Cloud Computing, which was transitioned from the Future Directions Committee initiative, became a TC. Similarly, there is one instance of the Technical Consortium on High-Performance Computing, which was formed out of multiple TCs (the Parallel Processing, Distributed Processing, Computer Architecture, Microprogramming, and Microarchitecture TCs). The technical consortium was introduced by Tom Conte, the CS president in 2015.

REISMAN: Someone else can answer this better than I can.

WALZ: The TCs are graded on their vitality, mainly of their sponsored conferences, whereas STCs are “graded” on the vitality of their communities. Thus, STCs are a committee of the Membership Program.

COMPUTER: Do you consider STCs an innovative entity in the CS, and why?

GRIER: When we started all of this, we were trying to institutionalize change, which is always a tough thing to do. When combined with special projects funding, we had a pretty unusual and aggressive means for changing the direction of the Society. The problem that we were fighting was the age-old issue of status. A position in a hierarchy can bestow a certain status on the occupant. Our academic members (as well as a few of our practitioners) are notoriously sensitive to issues of status. That means that some of the policies that we defined to put market pressures on the STC (pressures to innovate and be successful) were not as effective as they might have otherwise been.

MILOJICIC: I do consider STCs innovative at the time of their formation. Over time, circumstances change, and it is necessary to continuously innovate. More importantly, innovation needs to have a purpose stemming from a real need. The need to organize groups of people in the areas of their technical interests with new technology support will be with us for a long time to come.

TABLE 1. A comparison of approaches to organize technical activities within the CS.

Comparison	Approach				
	Task force	TC	Technical council	Technical consortium	STC
Focus	Technology	Stable technology	Very stable technology and participation of multiple Societies	Intersection of multiple technologies (container)	Community (technology, locality, career, standards, and so on)
Goal	Proving new technology can grow into a TC	Covering a technology area and have a traditional committee nurture it	Overseeing mature technology	Enabling multiple areas to overlap without losing the original committee structure	Creating new products and services as well as filling white space
Maturity	Immature	Mature	Very mature	Multiple very mature areas	From immature to very mature
Dynamics	Growing	Stable	Outgrown	Dynamic	Flexible
Size	Small (dozens)	Medium to large (a few hundred to a few thousand)	Tens of thousands	Multiple TCs, that is, many thousands	Starting with small to a few thousand
Approach	Traditional	Traditional	Traditional	Traditional	Social networking (community building)
Products	Workshops	Conferences (and, in the past, newsletters)	Conferences (and, in the past, newsletters)	Conferences	Conferences, newsletters, virtual teams, and so on

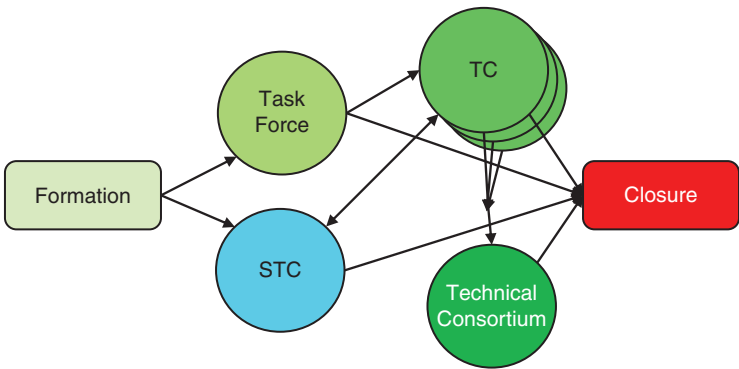


FIGURE 3. The lifecycles of different entities.

I consider STCs innovative at the time, as they changed the way people think about organizational entities, from those that took a long time to form and even longer to disband. This includes those that were inactive or dysfunctional for a long time as well as those that were easy and quick to form but equally difficult to stop, or sunset, as some of my colleagues said. Even more important is the missed opportunity to address new technologies

without an agile and instant reaction. STCs also enabled the rapid adoption of social media, which was quite innovative at that time.

REISMAN: Absolutely. As I mentioned earlier, the structure was disruptive to the stovepiping that is so common in IEEE. STCs allow members who are interested in a new computing technology or other common matter to get together quickly and collaborate without being

hindered by the various IEEE and CS policies and stovepipes. (Note that STCs weren't originally intended to only be technology oriented. We foresaw them forming based on different kinds of themes of interest to the members—for example, common geographies, industries of employment, and so on.)

WALZ: The Society's "tent" is larger than its sponsored conferences and publications and the volunteers who organize and manage them. STCs did blossom in many of the unattended "white spaces" in our very large field of interest. Future CS leaders will encourage the IEEE major boards to work together, starting with temporary, ad hoc structures like STCs and then moving to formalize them into standing committees or structures. TAB followed this approach with Standards and, with the Standards Association's involvement and blessing, formed the TAB Committee on Standards. Another example is Dejan's successful, multiyear effort to create the IEEE Industry Engagement

Committee Similarly, there are needs for technical activities committees on education and technical policies.

COMPUTER: What future do you foresee for membership organization in the CS, and what role do STCs have in that future?

GRIER: We'll know more in about 18 months. My feeling is that the Society needs to be smaller and more unified. (This is a common issue with professional societies. They often cast their nets too broadly.) Do you build a small, tight society with common interests, or do you build a larger group with many different interests? The CS has chosen the latter. As there are more ways to build small organizations with common ideas on the web, we could easily see a retreat from large groups. Now, one of the main things that keeps conferences within the Society is that IEEE guarantees the credit of these organizations. (There are a few other things, such as brand recognition, of course). I think that the general trend of professional societies has been away from large monolithic organizations, such as the CS, but the pandemic may change things. We shall see.

MILOJICIC: COVID-19 has posed new and unique challenges to all professional organizations. Switching to virtual meetings has broken all distance barriers for gathering people. However, cultural barriers remain and are even more obvious, with social injustice and unrest across the world. Forming effective and impactful groups, communities, and committees of CS members and nonmembers continues to be priority. It will never go away.

However, the whole notion of professional organizations undergoes substantial changes. Joining or leaving a virtual community, in most cases, became only a click away, with joining usually being free, depending on continuous changes in an individual's preferences. Therefore, membership in the CS has to become as nimble as ever to be able to attract 18 million

engineers, 28 million programmers, and many more physicists, mathematicians, chemists, economists, lawyers, doctors, and so on. All of them practice computer science and can benefit from the CS. They represent a huge missed opportunity for us.

To serve this ever-growing potential membership base requires a completely new IEEE and CS. Unfortunately, professional organizations are very slow to change, and some become distinct in their insistence on not changing (for example, the American Institute of Electrical Engineers, which eventually merged with IRE to become IEEE). Entering new fields that are continually changing is necessary to maintaining relevance and serving its base.

Communities and groups are essential in this transition. Some of the envisioned—but not reached—goals of STCs are still very promising. Addressing the needs for geographical and cultural membership, facilitating the education of members, and, most importantly, supporting members and corporations from industry could be a major differentiator. STCs could continue to evolve the CS toward a bright future. I see a focus on the Region/Section/Chapter and their products, for example, regional conferences as the largest opportunity and serving industry in these Regions as the largest opportunity for STCs.

REISMAN: This is a really tough question, especially during this pandemic time. No one knows how long this will last or what its lasting effects will be. Even if it turns out that we somehow manage COVID-19, it's a certainty that COVID-20 (or whatever it'll be called) is just around the corner. History shows us that we never learn from past mistakes. What we do know is that our traditional membership and activity participation are down and, I think, are unlikely to recover significantly in the foreseeable future. On the other hand, for good or bad, online everything is up. STCs have an edge in this respect since their existence is based on being

online. Therefore, I think that, pandemics aside, we should try to build out STCs, add function and purpose to them, and use them as a driving force for the future of the CS and IEEE.

However, having said that, I think it's imperative for CS leadership to have a serious look at STCs to see how to capitalize on them to help build that future. I'm concerned that STCs are perceived as just another entity among all of the entities over which the BoG has jurisdiction.

Unfortunately, the current structure of the CS BoG is a major limitation toward building on STCs. Often, new BoG members are elected to the board with an insufficient knowledge base and experience set on what's possible, what might be done, and how to adapt the CS to our newly emerging future. Just take STCs as an example. It took the four of us, all experienced leaders in the CS, to create and launch STCs. How likely is it that such a cabal of volunteers might form in the future? Looking ahead, I hate to be a naysayer, but I just don't see it.

WALZ: Just like the TAB FDIs, STCs do not charge a membership fee (they can charge for their services, for example, a newsletter subscription), so their contributing and consuming members can learn more about the Society and the larger Institute to decide to "join." In the future, IEEE strives to have an affinity with 10 times its current paid membership. Society STCs and TAB FDIs will be part of this large "membership" fabric. To achieve this 2019 goal, everyone affiliated with IEEE could use the IEEE tablet/phone app to engage in their own groups, such as technical communities, Chapters, conferences, TCs, standard working groups, public policy groups, and so on. This approach could change IEEE inside out, from top down to bottom up.

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