

A PERSPECTIVE ON THE IEEE LANDSCAPE: RECENT CHANGES AND FUTURE DIRECTIONS

The official full name of ComSoc is “IEEE Communications Society.” ComSoc is one of 38 technical Societies and seven Councils that comprise IEEE Technical Activities and which, through the IEEE Technical Activities Board (TAB), are integral parts of the overall IEEE organization. For this month’s column, I have invited Roberto de Marca, the current Vice President of IEEE Technical Activities and TAB Chair, to share his insights with us on the IEEE landscape, especially recent changes and future directions that have the most relevance to the Communications Society. Roberto is in a unique position to do this for us, since he continues to be a long-time ComSoc volunteer leader, and had served as ComSoc President during 2000-2001.

Roberto de Marca was a Fulbright Scholar at the University of Southern California, where he earned a Ph.D. in Electrical Engineering. Since 1978, Roberto has been on the faculty of the Catholic University, Rio de Janeiro, having held several leadership and administrative positions including Associate Academic Vice President. He has held visiting assignments in several institutions in Asia, Europe, and North America, and twice on leave he served as Scientific Consultant with AT&T Bell Laboratories. As Scientific Director of the Brazilian National Research Council, managing a 300 million US dollars research funding program, Roberto authorized the startup money for the national research network that led the way to the widespread use of the Internet in Brazil. He also was a delegate to several ITU meetings where the wireless 3G specifications were developed. Recently, he was appointed member of the Advisory Committee of Finep, the largest funding agency/bank for research and innovation in Brazil. Dr. de Marca was the founding President of the Brazilian Telecommunications Society and is a full member of the Brazilian National Academy of Sciences. He received the 1998 IEEE Communications Society’s Donald McLellan Meritorious Service Award for his sustained contributions to the Society.

BACKGROUND

The Internet has been developed in large part due to technological advances that were published in conference proceedings and periodicals of the IEEE Communications Society. The Internet has certainly changed the way we live, and in particular has forced corporations throughout the world to change their business models. IEEE was also forced to adapt and take advantage of the opportunities offered by the new reality. It developed a new package product known as IEL (IEEE Electronic Library) to allow widespread and easy worldwide access to roughly 2 million articles in today’s IEEEExplore (or simply “Xplore”) database. The IEL turned out to be a very successful enterprise and the IEEE’s revenues



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from its electronic package products have grown in 10 years from 20 million US dollars to over 115 million dollars in 2008.

UNINTENDED CONSEQUENCES

This remarkable result has also led to some unintended consequences. One of them is that IEEE Societies and Councils have lost some of the control they once had over their products. IEL and other electronic packaged products offered by IEEE are centrally controlled. The prices of the packages are now determined by the IEEE Technical Activities Board (TAB), and the management of the distribution tool as well as several of the publication guidelines are set by IEEE’s Publications, Products and Services Board (PSPB). Revenue distribution algorithms are now needed to divide the money collected among the Societies and Councils (S/C) that produced the intellectual property (IP), i.e. the articles. Changes to these algorithms could seriously impact Society finances. The current algorithms are weighted more heavily toward the usage (downloads) observed in Xplore. ComSoc has been one of the Societies that fared well in this new world since its publications have proven to be very popular among its members and customers.

A second consequence of this evolution was the increased importance in participation by S/C leadership in the activities of TAB and its standing committees (Periodicals, Products & Services, Conferences, Finance, Society Review, etc.). Decisions taken by these bodies can considerably affect the operations of a given IEEE Operating Unit. (Examples include the Educational Activities Board, Member and Geographic Activities Board, and Publications Services and Products Board.) As in any political organization, it is necessary to caucus in corridor discussions, participate in meeting discussions, and be alert to issues that may impact one’s constituency.

A third, and very serious, consequence is the consistent decrease in Society membership that has been observed since the world financial crisis of 2001. Total membership across all Societies in IEEE achieved a peak of 410,000 in 2001 and since then has been decreasing steadily, currently standing at around 310,000 (~24% drop). In ComSoc, this membership loss was even more pronounced, reaching ~30%. This major loss can be attributed at least in part to the new way the S/C generated IP is distributed. Potential members can now access IEEE’s publications content through IEL subscriptions purchased by employers and government agencies of different countries. Furthermore, Society visibility and user loyalty get diluted in IEL since people accessing the data base do not really care about which Society published the paper they are looking for. Therefore, IEEE Societies are being challenged

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to develop new products and benefits that will stimulate increased membership and also remain financially viable.

CHALLENGES AND OPPORTUNITIES

For the most part, the Societies are in good financial health and therefore are able to invest in valuable new activities that may appeal to members and the wider professional community. ComSoc is also attempting to develop new services and revenue streams. One example is the new certification program on wireless technology (WCET) that is presently being launched. Other S/C's, such as the Power & Energy Society and the very new Biometrics Council, are also developing certification programs. Also, the IEEE Computer Society already has certification programs in place. Certification is a relatively new activity in IEEE's products and services portfolio, and appears to be of great interest in several countries (e.g., India). Other Societies are also developing new conferences and publications in new areas such as Electronic Health, Nanotechnology, and Gaming. Other efforts relate to extending the reach of existing member benefits, such as implementation of Video Distinguished Lectures and professional contests.

The overall IEEE has been showing marginal growth in recent years, varying throughout the year between 350,000 and 375,000 members (this is irrespective of whether a member belongs to one or more Societies or Councils). This modest growth has been possible mostly by a consistent increase in membership outside the US, while the number of US members has been decreasing. It is expected that in four or five years there will be an equal number of members in the US and outside the US. The current total membership is considered lower than what could be achieved considering the total number of worldwide professionals that work in areas related to the IEEE fields of interest. Because of this perception, there was a group formed a few years ago to consider alternative membership models. The current thinking is to develop a solution where the membership fee will be relatively low to attract new members, covering only basic services with additional services being priced separately. It is expected that this will bring additional members to IEEE and possibly to Societies since the total amount paid by a Society member could then be lowered.

Membership is not the only challenge ahead. About 45% of IEEE revenue comes from publications. Hence any change in the landscape in this area can affect IEEE and its S/C's significantly. As most of you know, there has been an increasing push for Open Access publishing in some countries. Although this pressure has been more noticeable in the health sciences, its development may force IEEE to change its business model and come up with other revenue streams. IEEE is monitoring the evolution of this process and starting some experiments that may lead to the adoption of specific open access models.

Another challenge that is constantly being mentioned is how IEEE can be more relevant to industry. Industry, in particular in communications, has suffered major transformations leading to a much reduced focus on long term R&D and an increased emphasis on services, service management, technology integration, and customer behavior. With some notable exceptions (e.g., ComSoc's Consumer Communications and Networking Conference, CCNC), it seems that IEEE publications and conferences do not address these areas properly. Furthermore, increased pressure on academia for "number of published papers" has led to a dominance by academic research content in conference technical programs and periodicals, including the magazines that were originally supposed to provide technical coverage to a broad engineering audience.

Recently, at an IEEE event a keynote speaker who happens to be the CTO of a communications operator said that he offered to pay IEEE membership dues for 800 of his engineers. Only four took the offer because the remaining 796 did not see enough value in belonging. This statement should be an eye opener. How can we attract these practitioners to IEEE Society ranks? This year, TAB established an Industry Advisory Committee that is trying to chart a path to achieve this goal. There have been recommendations that IEEE should not miss opportunities to address in a timely manner areas where there is a convergence of technologies, such as in "e-Health," "Smart Grid" and in automotive electronics. Another strategic effort being led by IEEE Technical Activities is the design of a Technology Roadmap using an advanced graphical interface so that users may add their interests, thus enabling IEEE to identify gaps between significant market interest and existing technical activities. This tool should also facilitate prospective members and volunteers to find the information/products they need in specific technical areas across all S/C's.

IEEE is a 330 million dollar organization with over 1,000 employees. It has extensive volunteer resources and presently enjoys a very healthy financial situation. This led the IEEE Board of Directors, which has responsibility for overall management of the Institute, to invest in expanding the scope of IEEE activities to include humanitarian projects as well as enhance the recognition of the IEEE brand and overall public visibility of IEEE. One particular humanitarian effort that is being managed by IEEE Technical Activities is the so called Humanitarian Technology Challenge that is being developed in partnership with the UN Foundation and the Vodafone Foundation. This project also has an objective to identify major society needs, and then deploy IEEE experts to develop cost effective, scalable solutions that will be implemented later on by non-government organizations (NGOs). Solutions to several of the challenges being considered include: data connectivity for rural health installations, incident tracking, management and tracking of supply distribution, and disaster recovery. These all depend heavily on communications techniques and expertise. Hence, I expect that ComSoc volunteers will play a very important role in the Humanitarian Technology Challenge.

DIFFERENT VIEWS

Finally, there is an internal IEEE challenge, in part related to the new business models, that can create difficulties for its Operating Units (such as TAB) and the overall organization to fulfill the IEEE's objectives. The IEEE Societies several years ago were able to function fairly independently from the parent organization. Today several IEEE Societies still think of themselves as semi-autonomous organizations that would feel much more comfortable if the governance and management structure of IEEE followed a federation model. The IEEE Board of Directors has in recent years asserted its legal responsibility over the overall organization, backed up by unequivocal recommendations by legal counsel and external auditors. They see the Societies as an integral part of the organization that must abide by all corporate policies and processes and follow the established corporate strategic directions. Hence, in my opinion there is a disconnect between how the IEEE and some Societies view how the overall organization should be managed.

At the IEEE corporate level there is a view that Societies should generate as much surplus as possible so that initiatives created and managed centrally can be appropriately funded. These corporate initiatives are usually funded through an infrastructure charge to OUs that produces revenue through package products or through a reserve spending rule. Of course this

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behavior was significantly facilitated once it was possible to provide ready electronic access to the IP generated by Societies. There is also a question of where the product management of those products that rely heavily on S/C IP should reside. The constant push is to move this away from Technical Activities and into other OUs or “corporate.” A concern often heard is that because the number of Societies is very large, their position is frequently fragmented, thus delaying decision making. In response, if the members of TAB (mostly S/C presidents) make decisions thinking of the common good it is possible to make timely and appropriate decisions, even though the group is indeed large. Of course, a reasonable balance is needed across “common good” and “S/C interests.”

SUMMARY

In summary, it is paramount that Societies work together to assure that the management of products and services is satisfactory to them, that decisions made at the corporate level enable them to be financially viable, and that their volunteers continue to be motivated. There is an urgent need for more volunteers who are willing to devote their time to work in partnership with those of other S/Cs to guarantee that IEEE's overall Technical Activities unit operates successfully from both professional and business perspectives, thus allowing the overall IEEE organization to continue to provide outstanding services to its members, the profession and to humanity.