

## Two ideas for strengthening SSIT and IEEE

### *Background:*

Leah Jamieson --2007 IEEE President & Dean of Engineering at Purdue University-- spoke at the 2007 Frontiers in Education (FIE) Plenary Session on the topic "Passion for Engineering: Who Will Become Engineers?" This talk was a mix of "the engineer of 2020" blended with EPICS (Engineering Projects in Community Service), diversity, globalization, and women & minorities in engineering.

Ms. Jamieson argued that engineering in the future (2020) would no longer be a narrow technical specialist discipline but have a much broader base of concerns and knowledge. She emphasized diversity (different perspectives), business, contemporary global affairs, public policy, professional ethics, critical & imaginative thinking skills, communications and team work, etc.

She structured her talk around three "opportunities for change" (in engineering): 1) change engineering (*i. e.*, change the "content" of engineering); 2) change the message (marketing engineering to the rest of the world); and 3) engage partners (collaborating with other professions). Jamieson frequently brought up social sciences and liberal arts as important ingredients in the Engineer of 2020 program; these disciplines were felt to be particularly important for the "engaging partners" dance of collaborating with co-workers from other professions with diverse perspectives .

My proposal consist of two items that directly reflect Jamieson's "opportunities." The first -- partnerships -- addresses how IEEE and SSIT could respond to the "engage partners" opportunity for change; the second -- ABET "fhj" -- addresses how SSIT could strengthen itself by providing curricular support to changing the content of engineering as it transitions to a broader, more SIT friendly profession.

### *Proposal 1: IEEE Partnerships.*

This proposal is an IEEE-wide proposal directed at all IEEE societies; it addresses the "alternative membership models" issue mentioned in *The Institute* article on the new IEEE strategic plan (December 2007, p. 6) as well as the above issues raised by Leah Jamieson. It would be a major benefit to SSIT, but I believe it would benefit all IEEE entities.

*Issue addressed:* IEEE membership and affiliate membership fees are exorbitant and prevent many non-IEEE professionals from actively contributing to our SSIT mission.

*Core of the proposal:* The IEEE has members and memberships. It is proposed that IEEE create a complementary category of "partner" with corresponding "partnerships" with other professional societies. The basic idea of partner follows from the prediction of

increased participation by engineers in interdisciplinary cooperative activities that stress flat-world horizontal collaborative modes-of-operation – an open, sharing perspective (open-source, "wiki"-perspective) contrasted to a closed structure based on protecting one's knowledge and resources. One way to foster successful collaboration is to remove barriers that hamper sharing resources and knowledge. Thus, the IEEE "partner" category.

The basic properties of "partner" and "partnership" would be:

1. Partnerships could be formed between IEEE and any professional society/organization (engineer and non-engineer) when both societies agree that an open, collaborative relationship would benefit each of the parties as well as (human) society as a whole. I do not envision money changing hands in either direction between the two societies except *via* individual member payments listed in item 3.
2. The initiator of the partnership could be either IEEE or the partner-society. It seems logical that, in many cases, an IEEE society (*e. g.*, SSIT) would initiate and sponsor the partnership of a partner-society.
3. A member of the partner-society could become an IEEE "partner" by
  - a. paying an IEEE partner fee of \$48 (the magazine rack price of IEEE *Spectrum* for a year);
  - b. joining at least one IEEE society (*e. g.*, SSIT) and paying the standard IEEE fee for membership.
4. The partner would receive the *Spectrum* and all society publications selected for the year (*e. g.*, *T&S* magazine).
5. A partner would not have full rights of an IEEE member. Thus, a partner could not
  - a. vote in any IEEE/society election;
  - b. hold any IEEE/society office;
  - c. serve on any IEEE/society committees or Board of Governors;
  - d. receive any IEEE "service" packages (insurance, *etc*).
6. I recommend that partners should be able to do the following, but, if pressured, these could be given up also.
  - a. Sit-in on and express opinions in IEEE committee/BOG meetings during periods open to general discussion.
  - b. Receive the IEEE member discount for conference fees/publications.

The tie-in to the *Spectrum* magazine provides the following benefits. For the partners: they get something for their money (and the magazine is very readable for non-techies). For the IEEE: this puts the magazine in the hands of many new non-engineers, thus expanding awareness of IEEE and enhancing the public image of the profession. Further, expanded awareness and a more diverse subscription base might be accompanied by an expanded *Spectrum* advertising budget as new markets appear feasible.

*Strategy for implementation:* I firmly believe that none of us will live long enough to see this happen if we (SSIT) try to steward this up through the IEEE hierarchical, command-

and-control structure. I envision three requirements that must be met for any possibility of success. The three requirements and how they can be met are:

- We require a *champion* at a high level in the IEEE hierarchy. I believe we could have such a champion in Leah Jamieson (past-president of IEEE). If SSIT wishes to explore the possibility of partnerships, she is the first person we have to get on board. If Ms. Jamieson says she will not support this partnership concept, then I say we drop this and not waste time on it.
- We require *alliances* to provide an active but broader base of support than a single champion can give. I believe we have the possibilities for some natural (and powerful) alliances with computer engineers, computer scientists, and software engineers. For the most part, these disciplines are very supportive of horizontal, collaborative structures with open-source perspectives. Further, many of these people are already IEEE members; thus, they could personally provide internal (IEEE) support for the proposal while also recruiting support from colleagues still outside IEEE (ACM, *etc.*). Further, this would be hard, technical support for our proposal rather than the "soft" STS discipline support we (SSIT) could rally.
- We will require *broad support* for the proposal from many of the IEEE societies. This will take work since we will have to recruit this support; it will not be automatically forthcoming. If we pass the *champion* and *alliances* plateaus, then the effort demanded in recruiting support from other societies should be worth while since I think their support is achievable. My optimism is based on my view that the proposed partnerships provide advantages for almost all IEEE societies.

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### *Proposal 2: ABET "fhj."*

This proposal is much simpler and briefer than the preceding partnership proposal. It is totally focused on SSIT activities and (to the best of my knowledge) does not require approval above the SSIT BOG level.

This proposal concerns using SSIT knowledge and resources to assist engineering educators in successfully and seriously meeting criteria f, h, and j in the ABET Criteria for Accrediting Engineering Programs. These three criteria are very brief and will be stated here for the benefit of those who are not familiar with them.

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Engineering programs must demonstrate that their students attain:

- (f) an understanding of professional and ethical responsibility.
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- (j) a knowledge of contemporary issues.

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These all fall within the scope of SSIT, and I propose we create a web structure of some sort on our SSIT website to assist ECE instruction in our area of expertise. The FIE 2007 conference demonstrated to me that the vast majority of engineers teaching this material need a lot of help. Possibilities include syllabi, web papers (articles) specifically written for our site, links to specific relevant T&S (and other) articles, course modules, perhaps a chat room, *etc.* An active, web-savvy site manager is required for this site to be effective.

We should be some of the top people in the areas covered by ABET "fhj," and we could use this knowledge and experience to help others and further strengthen our reputation amongst engineering educators. I think it is possible that we could become *the resource* for ABET "fhj." Although this might not create a major windfall, I believe we could eventually pick up additional members (and partners (re, proposal 1) especially if we could develop a partnership with ASEE).