Telecommunications and Networking Program Chair Report
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1. What are the major factors in your discipline that are currently shaping its long term, strategic evolution?

The field is undergoing continuous technological change; some major trends impacting the discipline include the following. There is a major move towards content/information centric networking rather than the traditional connection oriented networking between two peers. This is illustrated by the fact that streaming video traffic is now considered the dominant traffic in wired networks. The widespread deployment of wireless networks and the increasing bandwidth available in the wireless area along with the explosion in mobile applications is leading to fundamental changes in the field as well. Other important trends are the commoditization of equipment, virtualization at various layers of the hardware and protocol stack, data center networking, networking as a service (NaAS) and security as a service (SaAS), increasing use of data mining/analytics by service providers for real time management and security and a growing interest in green/sustainable networking.

2. What is the impact of these factors? Why are they so important? What difference do they make?

The changes in the field have led to a robust job market. In fact according to US Bureau of Labor Statistics, networking and telecommunications is projected as one of the ten fastest growing job segments over the next ten years. Informally, the requests for job applicants and the posting of openings have increased significantly within the Telecom Program. The current hot areas of the job market focus on network security, wireless networking (LTE and IMS backhaul), application development (especially mobile), network support for data centers and network support for Smart Power Grid. However, the job market is predominately at the BS level and increasingly requiring US Citizenship. This has led to interest in developing undergraduate Telecom programs and calls for an accreditation effort in this area. This push is evident by the recent article in IEEE Communications entitled "Towards Specialized Undergraduate Telecommunications Engineering Education in the US" co-authored by faculty from leading universities (Stanford, MIT, NC State, etc.) and major Telecom companies (AT&T, Level 3, etc.). A copy of the article is included in the "References" section of the SIS BOV web site.

It is worth mentioning that even though the trend is towards US citizenship and BS level hiring, all MST students that graduated Spring 2012 got jobs or continued in a Ph.D. program (the small number of US citizens got multiple job offers at higher salaries). Spring 2013 graduates are continuing this trend with a few international students already securing jobs.

3. How do these factors affect the future of SIS and your program?

These factors imply that the faculty must continue to evolve the curriculum with changes in course content and course offerings to reflect the state of the art. We have recently modified the curriculum to include the requirement of a wireless networks course (Telcom 2700) and a security course (Infsci/Telcom 2810) for all MST students.

At the graduate level in Telecom and IS, the majority of the student body are international students but the job market is tilted heavily towards US citizens. This mismatch may lead to an enrollment drop if international students have problems locating positions.

4.   How can the School respond most effectively to these factors?

Focus on expanding the BSIS program, improving the quality of the students and extending the program to three or four years in order to add the necessary depth. This can be done in part by increasing the number of credits required for the degree and adding a third year. However, a four-year BSIS degree with a specific Telecom track would be ideal.

Allocate a staff position to the MST program – whose duties include in full or in part managing the Telecom Lab, advising MST students, responding to applicant inquiries, recruitment of students, placement of students and organization of internships and possibly teaching a course. Given the loss of two faculty positions (Thompson, Znati) this would increase the long-term viability of the program.
At a minimum, a staff position aimed at organization of internships for MSIS and MST students along with full time placement help would help continue the stream of international students.

Expand the use of adjuncts to provide courses on hot topics such as data center networking and virtualization.

5.   Who are the necessary partners that would need to be engaged in order to respond effectively?

The School would benefit from better engagement with industrial and government labs, particularly for graduate placement, student internships, equipment and software donations, guest lecturers and adjunct faculty.

Recruitment of undergraduates directly from high school would greatly improve the quality of the BSIS student body – this requires coordination with university level recruitment.

6.   What would an effective response look like and what difference would it make?

An effective response would result in new/revised course offerings, an organized internship program at the program and school level, an increase in the BSIS enrollment and a greater percentage of US citizens in graduate programs.