Microelectronic and Information Sciences Center

SUMMARY

MICROELECTRONIC AND INFORMATION SCIENCES CENTER MISSION

The Microelectronic and Information Sciences (MEIS) Center is organized to serve two purposes: first, to sponsor and conduct research on cutting edge problems in the microelectronic and information sciences, and second, to strengthen the educational offerings of the University of Minnesota and the other MEIS affiliated universities. *Each aim is as important as the other,* both to the University and the MEIS Center industrial members.

On the research side, the aim is to promote a significant level of research activity by providing a focal point for creative people, people whose collective impact can surpass their impact as individuals. It is from this perspective that the MEIS Center promotes first rate research by generating and sustaining a proper, even synergistic environment wherein the critical intellectual mass, the stimulations and interactions necessary for technical innovation can flourish, bringing life to the notion that knowledge (research) is more than a published paper.

Further, as first rate research in the MEIS areas requires facilities and equipment that are often excessively expensive (and soon obsolete), the MEIS Center is committed to the optimum sharing of resources. Substance is given this precept by the access to vast computing, LSI simulation, production, testing, and development resources being provided by the MEIS industrial partners.

From the educational side, the MEIS Center will allow the University to attract additional top faculty and students (particularly graduate), and, with the extensive MEIS Center available facilities, will allow new and expanded educational offerings. These enhanced programs will in turn attract additional good students, guarantee a stream of good graduates for first rate new hires, and allow the University to better serve as a first rate institution for continuing education of existing industrial staff.

While these educational opportunities may follow from the research activity, they are *no less* important, for several top notch institutions are necessary to supply the stream of quality graduates required by industry.

The measures of success of the MEIS Center are, then, not only the conventional immediate measures associated with publication, but also the more long term measures such as those associated with:

- royalty generating patents,
- software licenses,
- the magnitude and quality of the stream of graduates,
- the stature of the Minneapolis area in the MEIS domain,
- the level of corporate transfer and development of MEIS Center generated ideas, prototypes, software, and suggested business opportunities.

MEIS CENTER RESEARCH AND EDUCATIONAL ENHANCEMENT AREAS

The MEIS Center is committed to cutting edge research and educational development projects, in the broad areas of

1. *MICROELECTRONICS,* composed of
   a) *Physical Sciences*, including research into new materials, materials bulk properties, materials surface properties, effects of submicron device dimensions, device modelling, new device technologies, and new device fabrication techniques.
   b) *Design*, including research into chip design systems, chip functionality, layout, logic and circuit simulation, and chip testing.

2. *INFORMATION SCIENCES,* composed of
   a) *System Architecture*, including system description languages, distributed architectures, communication technologies, system control algorithms and protocols and their performance evaluation.
   b) *Software Engineering*, including programming and specification languages, correctness proof techniques, software productivity aids, structured design, and software testing.
   c) *Applications*, including process control, automation, robotics, image processing, numerical methods, signal processing, and CAD/CAM systems for mechanical design.

MEIS CENTER SUPPORT MECHANISMS

- Research and educational enhancement activities will be organized into projects sponsored by the MEIS Center.

- Interorganizational and interdisciplinary research and educational enhancement project teams are encouraged.

- MEIS Center sponsorship in the form of *"matching support"* is encouraged.

- Project proposals are generally originated by

  1. Project teams employed by any of the affiliated organizations.
  2. The Technical Advisory Committee or Board of Directors in the form of Requests for Procurements (RFPs).
  3. The Technical Advisory Committee or Board of Directors responding to externally generated RFPs or contract research agreements.

- Sponsorship may take the form of monetary support, support for access to MEIS Center available facilities, or both.

- Each project must have a designated Principal Investigator (PI) who is *directly* responsible for preparing written or verbal reports to the Technical Advisory Committee and to the MEIS Center Director.

- The projects sponsored by the MEIS Center *must* be responsive to the needs and objectives of the center as determined by its governing bodies.

- Sponsorship of submitted proposals will be based on a merit rating system whose components include:

  * The degree to which the proposed project is in accord with the objectives and policies of the MEIS Center.
  * The technical merit of the project.
  * Support requirements.

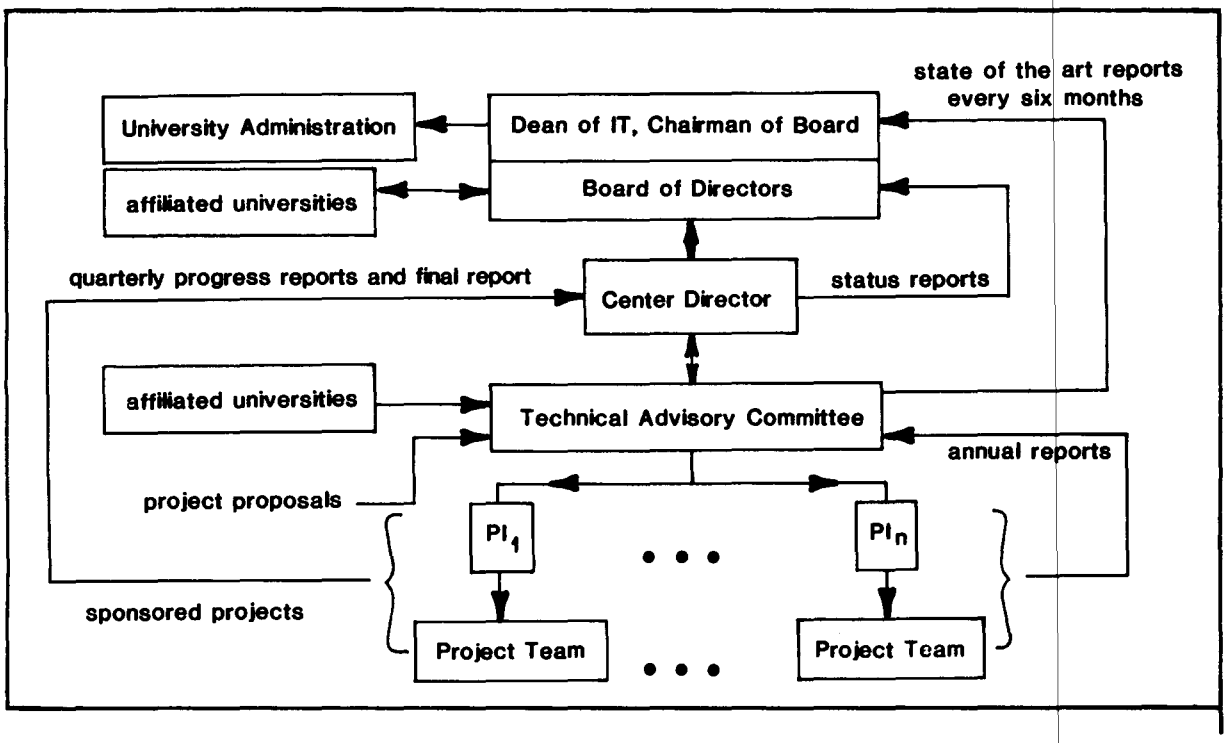

FIGURE 1. MEIS Center Organization and Management Structure

MEIS CENTER ORGANIZATIONAL STRUCTURE

The MEIS Center is a *cooperative* venture of several academic and industrial organizations. At present the University of Minnesota is joined by four industrial organizations –

- Control Data Corporation
- Honeywell
- Medtronic
- Sperry Univac

Affiliations with other corporations and with other universities will be established in the near future.

The MEIS Center organizational structure (Figure 1) includes a Board of Directors, a Director, and a Technical Advisory Committee. In summary:

- The organization reflects a *partnership* between university and industry.
- The Board of Directors is responsible for MEIS Center goals, policies, and integrity. The Dean of the Institute of Technology serves as chairman. Board of Director members provide the organizational links between their respective organizations and the MEIS Center.
- The Director is responsible for the day to day operation of the Center, adherence to the guidelines and goals set forth by the Board of Directors, and continued Center funding. The Director serves as Chairman of the Technical Advisory Committee.
- The Technical Advisory Committee is responsible for MEIS Center technical integrity, and is accountable to the Board of Directors. Technical Advisory Committee members provide the technical links between the MEIS Center and their respective organizations.

Specifically, the Technical Advisory Committee is charged with the following responsibilities.

- The Technical Advisory Committee is responsible for focusing the technical direction of the MEIS Center so as to concentrate on cutting edge problems while maintaining high quality and responsiveness to the needs of MEIS member organizations.
- The Technical Advisory Committee is accountable to the Board of Directors for assuring the quality of MEIS Center programs while being adherent to the policies and objectives of the MEIS Center as determined by the Board of Directors.
- Initially the Technical Advisory Committee is responsible for determining areas of emphasis (foci) within the broad areas given in the Enhancement Areas discussion above, and encouraging generation and submission of proposals addressing those foci. By controlling the foci, the Technical Advisory Committee is responsible for the necessary migration of the technical program.
- The Technical Advisory Committee is responsible for recommendations to the Board of Directors concerning the selection of affiliated universities.
- The Technical Advisory Committee is responsible for reviewing submitted proposals and making sponsorship recommendations to the Director. The Technical Advisory Committee members may either personally review proposals or solicit reviews from knowledgable persons.
- Reviews shall be completed in time so that sponsorship decisions can be made and given to the project PI within three months of proposal submission.
- The Technical Advisory Committee will attempt to merge small project proposals into single large project proposals when appropriate.
- The Technical Advisory Committee members serve as "technical links" between their respective parent organizations and MEIS.
- The Technical Advisory Committee may make recommendations to the Board of Directors for expansion of the research facilities and educational offerings of the University of Minnesota.

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