Liaison and Logistics Work with Industrial Advisory Boards

Kathryn K. Michel, B.A.
University of Colorado MAST Center
Boulder, CO

Abstract: *One model for successful university research centers is based upon close collaboration with other organizations, including large and small companies as well as federal and state agencies. Collaborations of this nature often involve an Institutional Advisory Board (IAB), which can have significant responsibility for management and financial oversight. This paper addresses two critical areas for facilitating a strong working relationship between a university research center and an IAB: (1) streamlining information transfer, and (2) organizing a well-run center meeting. The paper addresses specific strategies for effective information transfer among center participants including sponsors, faculty and students. Also discussed are best practices for center meetings that ensure a suitable level of efficiency expected of an IAB. The methods described in the paper are established, well-accepted psychological and organizational principles. These methods have contributed to the paradigm for successful industry-university collaboration developed over the last 25+ years by the National Science Foundation's I/U CRC program.*

Keywords: *Capacity Building, Research Collaboration, Social Network Theories*

Background and Objectives

Industry-University research collaboration has become increasingly important in recent years, due to a shrinking pool of available funds from state and federal sources. In order to maintain the level of research productivity expected at many institutions, researchers have increasingly turned to alternative funding opportunities through collaborations with industry. Ideal industry partners include those with a vested research interest who lack either the facilities or manpower to accomplish research goals. The National Science Foundation's Industry & University Cooperative Research Program (I/UCRC) has achieved considerable long-term success based on this premise (National Science Foundation, 2014). The Membrane Science, Engineering and Technology (MAST) Center site at the University of Colorado, Boulder is a member of the NSF I/U CRC program and continues to receive the majority of its funding from industry. During the last fiscal year, the Center distributed $650,000 in industry support to faculty from the three universities that comprise the Center, the University of Colorado Boulder, the New Jersey Institute of Technology, and the University of Arkansas at Fayetteville (Greenberg, Sirkar, Noble, Wickramasinghe, Meyer and Michel, 2014). All centers in the NSF I/U CRC program are required to have an IAB that oversee the distribution of such industrial funding.

According to the NSF model the IAB is comprised of representatives from private industry and government laboratories/agencies that interface with a research center to guide research direction and sponsor the training of undergraduate, graduate, and post-doctoral fellows through careful

selection of sponsored research and subsequent mentoring on the selected research projects. The IAB takes an active role in discussions on the specifics of technology advancement through:

(1) review of research progress reports

(2) selection of future projects submitted in a request for proposal (RFP) process

(3) in-depth mentoring of Principal Investigators and researchers

(4) participation in semi-annual meetings of research presentations

(5) providing feedback (NSF, 2014).

The typical IAB, comprised of technical subject matter experts, is organizationally led by a chairperson or executive committee tasked to lead communications and information transfer with the academic research center. The Chair also presides over Center meetings where operational decisions are made.

With the increase in collaborative efforts between industry and academia, there is a need to provide a logistical and communication framework that will allow industrial advisory board members to access needed information in a timely manner. Such a framework would allow more interaction and comprehensive feedback to assist academic research efforts.

Major challenges to effective IAB functions are maintaining active engagement and transmitting information in a timely manner. In particular, research centers are often hampered by the following deficits in technology and communications:

• Lack of a suitable communication platform for timely information access and transfer among the IAB, researchers and center personnel.

• Lack of training for currently available resources such as web-based platforms

• Lack of attendance at semi-annual meetings.

Within the last two years, the NSF I/U CRC program (NSF 13-594) instituted an operations track at their annual Director's meeting to address many of these issues. Within the 2013 and 2014 annual meetings there were sessions focused on ways to improve IAB relations and run more effective meetings (Michel and Greenberg, 2013, Michel, Palmeri, Schabenberger and Brown, 2014). Additionally, there were break-out sessions for collaboration with I/U CRC coordinators from across the United States during these meetings to share information and find novel solutions to these long-standing challenges.

Regrettably, the lack of existing literature on the subject is an additional challenge. The closest related articles in present literature that might serve to provide direction in logistics and liaison work for IAB's only describe the stressors for business travelers (DeFrank, Konopaske, & Ivancevich, 2000; Beaverstock, Derudder, Faulconbridge, & Witlox, 2009; Wickham & Vecchi, 2009). These stressors and needs will be addressed later in this discussion. However, despite a 30-year track record of the program through the National Science Foundation, the literature search did not locate any reports specifically tailored to the needs of an IAB working in collaboration with university research centers.

Through the example set by the Membrane Science, Engineering and Technology Center it has been shown that many of these challenges listed above could be addressed if research centers would engage in a concerted effort to embrace emerging technology and develop an appropriate hierarchy of needs to streamline information transfer, event preparation, and event coordination. When process run smoothly, it is more likely the IAB will be fully engaged. Full engagement is more likely to result in IAB members providing assistance in recruiting other organizations to join the center and perhaps increasing the likelihood of spin-off funding. The ability of the center to transform new IAB members into long-term center collaborators ultimately provides significant benefits for the center sponsors, faculty and students.

Methods

Part I. Effective Liaison Work with Industrial Advisory Boards

In order to determine what is most critical in liaising it is necessary to determine the primary goal(s) of the IAB, which may differ from Board to Board but generally include:

- Increased intellectual property and technology transfer for commercialization
- Development of access to current research
- Leveraged funding on a limited research budget, i.e., pay for one project, and have access to multiple projects (NSF, 2014)
- Gaining access to a hiring pool of highly educated students
- Establishing meaningful professional and networking relationships with other experts in the field/other companies, and to increase the general visibility of the organization (DeFrank et al., 2000)
- Attain social recognition of the commitment to collaborative research with academia

In order to accomplish the specific goals, IAB members need timely access to information, frequent and regular contact with the center, and assurance that intellectual property rights are protected. The MAST Center addresses these needs by:

- Scheduling frequent contact initiated by center coordinators and directors, considered to be advantageous for healthy collaboration
- Providing a secure server enabling direct download of regularly updated information
- Providing use of the center website (www.mastcenter.org) to post pertinent information for the semi-annual meetings, benefitting the IAB, researchers, students, and potential sponsor visitors.
- Ensuring real-time customer service by the center coordinators

The MAST Center found that inundating the IAB with a barrage of emails within a short timeframe desensitizes the audience, (i.e., the "importance threshold" was lowered significantly), resulting in unread email. To address the reported gaps in information retention and, given that the average person can remember three to four items of information from one associative trigger

(Cowan, 2010), MAST had the most success in transmitting information with emails limited to three or four items related to a single theme. Experience indicates that monthly contact between meetings is effective for general communication while more frequent, targeted contacts are utilized effectively for specific issues.

The mechanics of the MAST Center information transfer have evolved over the last 15 years to keep pace with technological advances, replacing the multiple hard-copy environment with the following resources:

- Secure Server: The secure server has downloadable information resources for the IAB to access via username and password including information rosters, project report history, meeting history, sample agreements, and a section to conduct Request for Proposal cycles.

- www.mastcenter.org: The MAST Center website provides links to pertinent center information. , The website been organized with the assistance of specialists in marketing and psychology. It is reviewed and updated on a bi-weekly basis. Portals to online registration and proposal and project report submission are linked for easy access (see below).

  - www.regonline.com: This service allows for secure online registration for meetings payable by credit card. After account initiation, meeting organizers can establish a registration portal that is linked to a meeting website. Opening an account is free; however, there is a fee for each transaction.

  - www.formsite.com: This service provides secure online submission of proposals and confidential progress reports. The website allows administrators to access the secure online repository to download the files via the secure server with successful transmission confirmation. The service charges a minimal fee in relation to the number of portals and forms that are in effect at one time.

  - www.surveymonkey.com: This service allows project feedback to be accomplished in less time than required by traditional manual survey methods using paper copies, collating and manual data entry. The surveys can be collated quickly and individual reports can be created and distributed for review and incorporation into planned research direction.

In addition, the IAB needs to have a secure infrastructure which allows proactive operation within required timelines. Advances in secure technology including secure web and server access have made significant strides in fulfilling this need. Future directions for secure technology are being determined in upcoming meetings with the IAB.

Part II. Best Practices for IAB Meeting Logistics

Face to face meetings allow for greater depth of communication and understanding as well as adding the advantage of real-time decision making that is often impeded by technological delays (Arvey, 2009, Richman, 2013). Among the areas that have been determined to benefit from face-to-face meetings are the following: 1) to understand the reactions to the information presented by interpreting facial expression, body language and tone of voice, 2) to capture attention in order to initiate a new idea/process, 2) to inspire a positive group climate, 3) to build relationships, and 4) to make decisions based on complex information (Richman, 2013; McEuen and Duffy, 2010).

All of these conditions are present within the average IAB meeting. While some might believe that technological advances enable the substitution of an "in-person" meeting with webinars, videoconferencing and teleconferences, the MAST Center has found that the benefits of real-time and face-to-face contact are critical for success: not only is there the opportunity to work with researchers in real-time, but there is also a chance to build meaningful relationships among industry, faculty, and student researchers (Beaverstock et al., 2009).

However, travel is stressful on many people and the IAB representatives are often required to travel more than their peers. Goals of an IAB meeting include review of research results, mentoring of researchers and students, and networking with other sponsor companies, requiring two-to three days for meetings, plus travel time. Therefore, ensuring that the needs of the IAB members are met has become a pivotal factor in successful meeting preparation and optimization of IAB performance.

In order to adequately determine needs of attendees it is beneficial to study the demographic of the IAB. IAB members often have the following traits in common:

- Between 35-65 years of age
- Possess advanced degrees and are technical experts in their field
- Experienced travelers with high standards of logistics and performance
- Frequent travelers with a higher-than-average stress level (DeFrank et al., 2000)
- Some have administrative staff that assists them with tasks and arrangements
- Access to decision-makers in their companies, but are often restricted by company/governmental policy and budget considerations.
- Several destinations are often grouped in one trip

Daily business tasks are not suspended while on travel, and they need to maintain contact with their home companies. These traits cumulatively represent a demographic with a higher expectation of service in the travel industry partners used (i.e., chain of hotel, reward programs, etc.) as well as a need for higher level of organization of travel plans.

According to popularly known theory of the hierarchy of human needs (Maslow, 1943), a person's physiological needs must be addressed before emotional and self-actualization needs.

Maslow's hierarchy of needs shown above (Gupta, 2014), might be reasonably reframed in the analogy below to apply to the needs of the IAB.
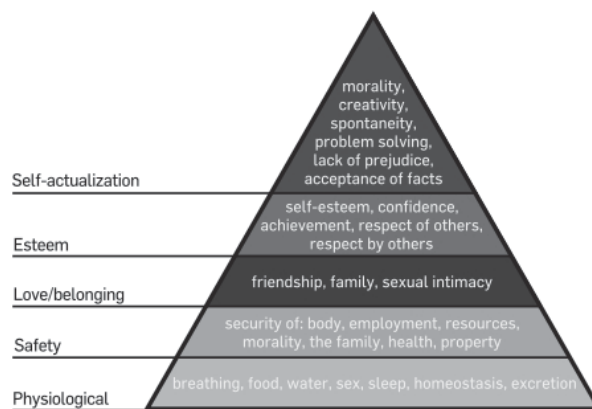

Figure 1. Abraham Maslow's Hierarchy of needs (as shown in Gupta, 2014)

Figure 2. Hierarchy of IAB Meeting Needs.

For the purposes of business travel and meeting function, the focus of the five major stages has herein been shifted. The first two stages are identical to Maslow's, whereas the third stage is primarily concerned with teamwork and networking. The fourth stage addresses recognition of competence, mastery, and the respect of others, and the fifth stage focuses on problem-solving, morality, creativity, and fulfilling the overall organizational mission. The meeting planner is responsible for the first two stages, while the other three stages are accomplished though meeting activities.

The first question addressing the modified hierarchy is "how will the meeting attendees be as physically comfortable as possible?" It has been determined through past IAB meetings if physiological needs of attendees are addressed consistent physical and intellectual engagement remains high.

Schedule details should be addressed at the onset, including meeting dates as well as daily activities. When the MAST Center convenes a meeting, the following elements are considered to combat meeting fatigue:

- academic calendars of the institutions,
- related professional meetings
- religious holidays
- location of the nearest airport, reducing travel time
- break schedules at (maximum) intervals of 2.5 hours
- Having ample space to present.

Logistics are arranged for activities, including meetings, evening functions and poster sessions, with a goal of providing a reasonable vantage point with room to comfortably stand and walk. For seated functions, provide at least 36 inches between tables to allow for movement of chairs, and screen projection angles are not more than a 45-degrees. For poster sessions, allow for 48 inches between projects and leave at least a 60-inch walkway. These configurations prevent crowding the presenter and eliminate "choke points."

Travel assistance and local amenities are initial planning details. Executives, even technically-oriented ones, expect certain amenities at lodging accommodations (DeFrank et al., 2000) - many require executive rooms with shuttle service, a fitness center, a suitable restaurant, and reliable wireless access. It is wise to negotiate a discounted room rate, but this may not always be possible unless a room block can be guaranteed. It is a good practice to give attendees a range of lodging choices, to accommodate budget and frequent-traveler preferences, if possible. Organizers of meetings should investigate options for shuttle services, but some travelers may also choose to utilize public transportation or rent their own means of transportation. For those who are walking to the meeting site, the organizer should make sure that comprehensive maps and directions are available. A best practice is to walk the route personally, verifying that the directions are accurate. Provide a list of local restaurants, for attendees who choose to dine out. It is beneficial, if possible to have a local contact host excursions. Hosted dinners (our Recruitment Coordinator, who has at times labeled himself the "surly native guide") are particularly effective for both recruiting and networking purposes.

With a significant portion of IAB meeting functions centering on mealtimes, it is important to pay attention to food choices. Many executives have reported increased consumption, leading to stress and in some cases making an attendee physically ill (DeFrank et al., 2000). Given the range of the typical IAB meeting attendee, the dietary needs can be complicated. Common dietary needs include:

- High-protein, low-fat and lower-carbohydrate meal choices
- Higher vegetable/meat quotient, and more salad options
- Fewer fried hors-d'oeuvres and more fresh vegetables, fruit and cheeses
- Smaller-portion desserts
- Ample supply of quality coffee
- Cold water on hand at all times in all meeting/function rooms
- Quality beer and wine choices
- High quality box lunches may be served on the last day to accommodate travel schedules considerations.

Ensure that meeting technology is available and working properly, in order to decrease attendees' travel stressors (DeFrank et al., 2000). Since most attendees are also working with their home companies while at a meeting, inadequate connectivity can be a serious point of contention (Wickham & Vecchi, 2009). A requirement for any site is reliable internet access with a high transfer speed. Additionally, sound systems must accommodate speakers with low volume voice output, and use of an in-house projector and screen with high resolution is a must. Within the last year, the MAST Center has also instituted the concept of the "Meeting Office," allowing use of the secure server at the meeting site, printer availability, and access to other services.

The next issue in the Hierarchy of IAB Meeting Needs model relates to the 'organizational safety' of the meeting. Experience has shown that timely and proactive transmission of information seems to assure attendees that they have immediate access to necessary information, thus increasing their

sense of safety and security. To accomplish this, a schedule of information transfer is established using the following timeline:

- **3 months prior to meeting:** Announcement of dates and initial travel resources are communicated via email, and posted on the meetings page of www.mastcenter.org.

- **2 months prior to meeting:** Notification that the online registration portal is open and a preview of the overall meeting agenda (also available on both the website and the secure server).

- **One month prior to the meeting:** Reminders are sent regarding meeting registration, travel information, transmission of schedules for presentations and mentor meetings.

- **Two weeks prior to the meeting:** Notification that written progress reports are available for download and review in the secure server as well as the business meeting agenda.

- **One week prior to the meeting:** Notification that presentations are available for download and review in the secure server, as well as any last-minute items required for the meeting.

While it could be argued that one-to-two weeks' notice for read-ahead material is too short, experience has shown that longer time frames do not produce better preparedness: when sent too early, it is often "put on the back-burner" and not viewed at all, or there is poor recollection of the material read early.

Nonetheless, it is important to note that careful preparation will not anticipate every circumstance. Thus, it is critical to have contingency plans and standard practices that will accommodate the fluctuating needs of the IAB meeting. Below are some best practices that have been found to reduce stress, and increase the feeling of "on-site sense of safety" for attendees:

- The meeting coordinator is first on and last off site. The coordinator checks all equipment and meeting details to ensure equipment functions properly and the space setup is correct. The coordinator is responsible to obtain assistance, if an issue arises.

- The coordinator is tasked along with the center directors for ensuring the meeting is on schedule. Over-runs and delays due to lack of preparation are unprofessional.

- The coordinator will have all pertinent information for the meeting available for immediate access. This information should also be readily accessible either by print or electronically for attendees.

- The coordinator will have contingency plans that anticipate the needs of the attendees (e.g., extra parking passes, number for the airport shuttle, a printer for boarding passes, etc.).

- The coordinator will have a backup plan, including phone numbers of vendors and all relevant event points of contact.

- The coordinator follows customer service basics: listen, comprehend, and assist the attendee in finding an acceptable solution. Additionally, the event staff needs to remain calm in the presence of attendees, to reduce the stress and prevent unforeseen circumstances from impeding the meeting.

When the physiological, organizational safety and informational needs of IAB members are satisfied, according to the Maslow Hierarchy model, they are equipped and prepared to

progress to the successive stages of needs fulfillment - social contact, esteem fulfillment, and self-actualization. It is in these latter stages where the IAB is then enabled to 1) perform at the most optimal levels in teamwork, networking, and mentoring activities; as well as 2) conduct essential problem solving through creative, moral, forward-thinking discussions.

Results

The MAST Center has had a successful history for the last 24 years as an I/U CRC as both a single site center and a multi-site center, currently comprised of three sites: the New Jersey Institute of Technology, the University of Colorado Boulder, and the University of Arkansas Fayetteville. The Center has had a total of 59 sponsors over the last 24 years that have made possible 88 completed three-year projects and 14 more currently in progress. There are 14 faculty members working on these 14 projects, supporting 14 graduate students and 6 post-doctoral fellows at 3 universities. Over the life of the center, 253 peer-reviewed publications, 580 presentations, and 7 complete patents have been realized. Spin-off funding for related research has been generated in excess of $32M. The MAST Center administrative operations ratings and meeting organization procedures are considered to be particular areas of excellence as evidenced in the results of survey feedback from all attendees and as stated in our Evaluators' Report to NSF (Greenberg et al., 2014, Meyer, 2013, 2014).

Conclusions

Research centers that engage in a concerted effort to work with emerging technology and the hierarchy of needs to aid in streamlining information transfer, event preparation, and event coordination, have been shown to produce highly efficient meetings with engaged IAB members. Such engagement can lead to the high productivity levels demonstrated by the MAST Center over the last 24 years.

Author Note

Kathryn Michel, B.A.
University of Colorado MAST Center
Department of Mechanical Engineering
432 UCB, Room ECME 267A
Boulder, CO 80309
Phone: 303-492-4614
Email: Kathryn.Michel@colorado.edu

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www.surveymonkey.com, online survey engine used for project feedback.