

Industry-Academia Successes @MIT

Beneficial Activities Resulting from Industry Interaction on Campus

**Experiencing Technology Transfer & Commercialization:
Fostering a New Dialog with MIT
Workshop #2**

Tony Knopp - MIT Industrial Liaison Program
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ILP Services, Products and “Deliverables”

- **Industrial Liaison Officer**
 - A highly-productive interface to help initiate, integrate and manage the company’s interactions at MIT
 - Account manager - Relationship overseer - *Search Engine* - Facilitator
- **Facilitated access to MIT people, resources**
 - On-campus sessions with faculty and research staff
 - Faculty visits to company sites
- **Executive research briefings**
- **Symposia and conferences**
- **ILP website (members only)**
- **Customized research reports**
- **Publications**

Typical Benefits ILP Members Receive

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- Monitor emerging/disruptive technologies
- Discover new technologies to strengthen existing businesses
- Validate or invalidate key investment decisions/ new product development
- Solve short term technical problems
- Identify new industry partners
- Use faculty for consulting/ advice
- Participate in new industry standards setting
- Train employees
- Recruit new employees

“Best Practices” for ILP Members

- **Frequent visits to campus**
 - Problem-driven, exploratory, narrow, broad, individual meetings, roundtable, brainstorming
 - Leverage conferences & seminars
 - Make use of visiting scientist, engineers
- **Follow up / involvement / investment**
 - Consortia, sponsored research, visiting scientists/engineers
- **Strategic briefings for senior/research executives**
 - Theme or broad-brush approach, networking opportunity across company division, businesses
- **Interactions with faculty**
 - Consulting and training
- **Broadcast MIT/ILP offerings throughout company**
 - E-mail server, intranet, company’s communication infrastructures

Agenda

- Novel Ice Cream Technology
- RFID embedded in Packaging
- Interactive Voice Response
- Dough Rolling
- My M&Ms <http://www.mymms.com/>
- Examples of:-
 - New Technologies
 - Consortium Research
 - Executive Briefing
 - Recruitment of Students
 - Consulting

Novel Ice Cream Technology

- Frozen Foods Research Director, Global Food Company
- Visit In re: Cryogenics Technologies
 - At the end of visit (last five minutes) the MechEng faculty asks “*How is Ice Cream Produced?*”
- Over the next twelve months MechEng faculty with his fourth year undergraduate student design, apply and receive Deshpande Center funds, build a new machine to make ice cream, patent the technology and student writes her graduating thesis.
- In the following academic year a food company supports (\$500K) faculty research and student’s PhD.
- Within the next two plus years, we will have a novel Ice Cream product, tasting most interesting and produced in a more energy efficient manner.

RFID embedded in Packaging

- Taiwanese paper company attended ILP sponsored conference which launched RFID consortium on campus.
- Member followed up with RFID researchers.
- Member incorporated RFID printing technology in its manufacturing capability.
- When Walmart set the RFID requirements for receipt of goods (packaged and in cartons), the company won a majority of Walmart's top suppliers' business.

Interactive Voice Response

- Media/Cable TV member joins ILP.
- ILP officer visits firm to “listen, probe and understand” member’s challenges.
- VP for IT visits campus for a series of meetings.
- While meeting CSAIL director, who is describing activities including speech recognition, VP has an “eureka moment”.
- Member “connects” with CSAIL’s Spoken Language Systems group-supports research, hires interns.
- Member firm researches and adapts various demos of natural-language interactive systems within firm, slowly.
- Initially internal automated call center followed by support systems and integrated within firm’s services, database and vendor operations.
- Available today to 13.3M public customers.

Dough Rolling

- Manufacturing Director Global Food Company comes to campus for introductory first visit set of meetings. One of his “*headaches*” was
 - A brand new \$350M plant operating at half speed because two \$40M dough rolling machines designed-to proprietary specs, are unable to roll the dough at “full speed” (operating at less than half speed).
 - During the visit the “*problem*” brought to ILP’s attention
- ILP schedules a Visit In by manufacturing director, plant manager and machine designer for six meetings with faculty from the departments of Material Science, MechEng and ChemEng for discussion and a short video of the problem.
- Based on these discussions at MIT, staff went back and “*tweaked*” the problem. Today the plant is at full capacity.

My M&Ms <<http://www.mymms.com/>>

- Member CTO visits campus 2-3 times a year.
- R&D staffs exposed to broad and diverse technologies and management practices @MIT over time:-
 - 3-D printing - Materials Science and Engineering
 - Weaving technologies - Mechanical Engineering
 - Food Etching - Media Lab
 - Innovation Lab - Sloan School of Management
 - Entrepreneurship Center - Sloan School of Management
 - Chemical Engineering Practice School
 - Internal Venturing - Sloan School of Management
 - Center for Information Systems Research @Sloan
- New Business Model - innovative, entrepreneurial, use of both internal and external company resources.
- Over \$200M business in less than three years.

New Technologies

➤ E-Ink Technology

- Large healthcare, lifestyle and lighting company visits MIT's Media Lab
- Introduced to e-Ink technology
- Participates in the spin off start-up
- Technology critical to Amazon's Kindle success

➤ Encapsulation for Delivery Technology

- Beverage company wants healthy additive (Omega III) in drink.
- Food company want a “garlic smell” to emanate from frozen pizza heated in a micro-wave.
- Langer Lab - primarily drug delivery, is challenged by the economics of the technology in the above examples
- Research work with members' R&D staffs and solutions arrived at.

New Technologies

- Auto company sponsored multi-year research at Materials Processing Center after ILP introduction, resulting in firm introducing new materials technologies and incorporating materials trade-off analysis.
- Electronics company wanted to change material to biodegradable polymer. ILP introduced faculty in area of drug delivery and company worked with faculty to use new material.
- Consumer products manufacturer used ILP to identify new metal finishing technology that allowed cost-effective market differentiation for a major product line.
- Chemical company sponsored MIT research which led to decision not to fund new polymer fiber composite and saved millions of \$\$\$s.
- Electronics company met various faculty through ILP who evaluated (informally) their new medical device technologies.

Consortium Research

➤ Aircraft Manufacturer - Integrator

- As an integrator - other firms produce and the member is responsible for certification.
- Must have technical expertise in many technologies.
- Nano-Engineered Composite consortium on campus.
 - Suppliers, Producers, Users.

➤ Auto Manufacturers and Suppliers (1995)

- electrical power in future cars.
- 14 volt to 42-volts battery.
- design and research technologies for open and global platform.

Sponsored Research

- Mining company has excess low grade titanium nitrate. Sponsors research with Material Science faculty on new process for making titanium which lowers the dollar and environmental cost and thereby may increase supply of processed titanium.
- Global Commodity trading firm sponsors post-doc in Sloan's Lab for Financial Engineering to integrate Internet capture data with trading algorithms.
- National Retail Chain wanting to optimize products placement in stores based on stores' geography and customer populations sponsors Operations Research Center doctoral student(s).

Executive Briefing

- **Mobile Device company**
 - 50 staff representing Engineering, Marketing, Sales, Product Development units with the purpose to create cohesion.
 - 6 Faculty representing computer hardware & software, wireless technologies, management practices of innovation and disruptive technologies present to the group with Q&A.
- **World Federation of Exchanges (trade association)**
 - Three day briefing on campus for Exchanges' CIOs (7th this Nov'09).
 - MIT faculty presenting (ie, security, quantum computing, W3C, IT governance, AI, Internet infrastructure, Internet economics, business/management models, entrepreneurial education, economics, financial regulations) with Q&A and discussions.
 - Briefing include:- broad & narrow topics, members & vendors presentations, futuristic issues, brainstorming on common issues.
- **Manufacturer of Refrigeration company**
 - A 5 day executive briefing for 10 employees to address new, emerging and potentially disruptive technologies and materials for refrigeration and compressors with 18 faculty members.

Recruitment of Students

- Financial services firm's large support of research at three MIT schools, allowed them to target potential employees through research activities, joint projects, data exchanges, and summer internships; all resulting in the firm being one of the top recruiters on campus for four years.
- Large consumer/industrial products company hosts yearly recruiting visits, coordinated through their ILP officer. The company currently has 45 MIT alums in the workforce and makes a number of new MIT hires each year as a result.
- South American bank for past 20 years sending 1-2 mid-career managers for a Masters at MIT's Sloan ... over time, a cadre of MIT educated within the bank's senior management.
- Government-Industry consortium held a Recruitment Day on campus facilitated by ILP yielding 10 internships and two full time job acceptances.

Consulting

- Food company's need for due diligence on soup vending machine's new heating unit technology - hired electrical engineering faculty.
- Paper products firm need for in-plant long-range sensor technology - hired a space weather imaging researcher.
- An aerospace/defense company attended an ILP conference, and heard a presentation by a faculty member on autonomous processes. With follow-on discussions facilitated by ILP, the company funded the professor to adapt the processes for the company's benefit.
- Healthcare company hired a faculty who solved a manufacturing polymer performance issue holding up a product release.
- Auto company used ILP to identify candidates for advisory board position.

Ingredients and Recipe

➤ Industrial Liaison Program:

- Possesses a broad and diverse view of the entire campus.
- Cultivates relationships with senior management, faculty and research center staffs on campus.
- Pro-active with member's management and staffs.
- Exposes member to activity on campus - the known, the expected, the unknown (*“but need to know”*) as well as the unexpected (*“didn't know I needed to know”*).
- Supports synergies and network activities between academia and industry.
- Advocates for industry within MIT.
- Chief gateway and guide which helps industry initiate collaboration.

The Program is the “oil & glue” between academia and industry.

Thank You

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Questions and Discussion

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