ESTABLISHING LINKS BETWEEN INDUSTRY & PROFESSIONAL INSTITUTE IN THE AREAS OF MUTUAL BENEFITS

Charudatta Pathak[1]

Abstract ¾ Today thee are heavy pressure on professional institutions to generate revenue from internal resources. Industry also cannot implement innovative ideas for productivity improvement due to monetary and manpower constraint but still they need customized solutions to their problems at minimum cost to stay in competition. At the other end professional institute having sound faculty can bare development cost of research-oriented projects due to zero risk factor. Hence sound partnership between industry & professional institutes is must for betterment of both. The paper presents the method to systematically establish rapport with industry. The guidelines/steps presented in the paper is the outcome of author's own experience of executing consultancy assignment. In-depth analysis of plant operations and effective communication with top management of industry is prerequisites for starting liaison with industry. This should be followed by neat documentation of current operating procedures of plant & proposed enhancement leading to productivity improvement or solution to industry specific need. Formal presentation with schematic diagram should be made to show proposed system, which will use all electronic advancements. It should be followed by feedback from user of proposed system in industry. This work should lead to detail techno-economic feasibility. A case study based on a project executed by author for a UniLever group industry is also presented here. This is the original work of author.

NEED FOR INTERACTION

The aim of Interaction is to foster continuous innovation among a critical mass of creative people and communities working together in novel ways. Inspired by a human–oriented vision of the potential of information technology, the institute involves researchers and graduate students from many different backgrounds and perspectives in a unique partnership. They include interactive system and technology developers, interaction and product designers outlining new concepts, interactive media artists developing new media forms, human and social scientists achieving new insight into the relationship between users and technology. The result is the emergence of a new innovation culture.

Large companies confront an innovation dilemma, they often have immense technological know–how, but find it hard to understand what is valuable for people in their everyday lives. To make matters more difficult, the boundaries between infrastructure, content, equipment, software, products and services are constantly changing.

Interaction with professional institute offers companies a way out of the innovation dilemma; it delivers new service concepts that are perceived by their users to have quality, richness and value. This process also generates new business concepts. Interaction provides its industrial Associates with a context for making new connections, association with the leading minds in interaction and 'first–mover proximity' to new concepts, tools and processes as soon as they emerge. Interaction is a completely independent Association – but its industry Associates are not passive sponsors, they will develop many new ways to share the concepts, skills – and people – that the professional institute produces.

Industry Institute Interaction is an addition – not an alternative – to university postgraduate departments and corporate research laboratories. In order to do things differently, organizations need to see things differently. The emphasis at Interaction will be on know–how rather than know–what. Its unique focus should be the integration of engineering with cultural design – and the development of new business models. Teaching and research should be driven by people and culture, not by technology. The Institute should also have a different model of learning from that of traditional academic institutions - more doing, less listening to lectures. The Institute should stimulate connections among new combinations of experts and organizations; these new connections will feed into and out of the industry Associates in a continuous process. Interaction is not like a corporate lab whose success is measured by the value of its patents or intellectual property rights (IPR), the key success criterion of the Institute is that associated companies, organizations, and individuals will apply its knowledge and best practices in their own situations.

Benefits To New Partners

Industry partner benefits include opportunities to:
- Meet faculty conducting research in related fields
- Identify the ways that students can meet their internship and employment needs; and provide a forum for industry partners to communicate their

interest and support for the University's education and research mission.

- To develop a range of relationships with the University which is beneficial to both sides.

Institute also gets opportunity to:
- Gain insight into the future direction of industries related to that unit's teaching and research programs;
- Learn about future industry hiring and research needs; and
- Connect students with internship and employment opportunities in their field of choice.

Industrial members should see the Institute as an extension of their in–house research and development. The aim is to foster the near–real–time uptake of ideas, concepts and innovation processes, and that know–how should be given as much emphasis as know what. Knowledge will be shared in a variety of ways. Companies turn ideas into technologies and products and bring opportunities in software and systems to industry. Institute develops innovative solutions to industry's research, manufacturing, and engineering problems.

Working Together

Experience has shown that an effective working relationship for developing market- driven technology solutions is through cost-shared collaborative R&D projects. These collaborations can be one-on-one with one industry alone or can be multi-party with several participating organizations pooling resources to share costs and risks.

Academicians with hectic schedule of teaching, exams & campus development may not dedicate time to serve solutions to industry problems which need urgent attention hence scope of work in the area of industrial engineering, productivity improvement, better MIS & training should be explored.

METHOD TO INTERACT

Quest and pressure for internal revenue generation are key motivation factors, which prompts for restless hunt for external fund raising sources, which can utilize in house talent. The multifold strategy, describing systematic steps, developed by author that was successfully followed to establish links with industry is described below

Determining Self-Strength & Area of Interest

This is the first step & half work of ultimate success. Own strength, technical ability & area of specialization should be documented on paper along with interest, which should necessarily match own ability. A highly skilled person working on technical project & working on accountancy software development project just out of interest may prove hazardous. Own technical ability should always outweigh

vague interests and mind should be motivated towards inner strengths. External counseling may help in this matter to great extent. Time required 2-3 weeks.

Building Team

Two is always better than one. Colleague/friend of like interest should be encouraged to participate in this project. This helps in broaden the vision and attitude to look at the problem. Somebody has correctly defined TEAM as Together Everybody Achieves More. Also team spirit plays a key motivation factor to achieve goal.

Literature Collection Related to Advancements in the Area of Specialization

This is second important step that calls for constantly updating knowledge base related to area of specialization. Many ways such as
- World Wide Web Search
- Journals
- Books
- Attending Technical Seminar
- Participating In Short Term Courses Etc.

should be opted to do this exercise. All the material collected should be grouped into one file, as hard copy group discussions should be held to get more insight into the matter. Academic seminars of the students are very useful in this matter. All this hoe work should be done before industry visit/interaction. Time required 4-6 weeks initially later on it is a continuous process.

Industrial Survey

Comprehensive survey of industry in nearby region should be carried out to find industries related to area of specialization. Local industrial directory is useful in this phase. Enthusiastic students may also help in this work to prepare the list of industry of interest along with other necessary details such as
- Location
- Address Of Directors
- Turnover
- Plant Nature
- Capacity
- & Overall Technology Level.

Industries should be then grouped into different categories such as process industry, production shop, job order shop, R & D firms, consultancy firms & mix. At the end of this phase target will be ready. Time required 4-6 weeks.

Establishing Communication with Industries of Interest:

There are several ways to build rapport with industries of interest, which can be broadly classified as direct communication & indirect liason building exercises. In direct communication middle/top level management of the

industry can be directly approached to seek permission for plant visit for analysis purpose with the intension of finding ways & means to improve existing facility. This way should be followed after the doing all the work of indirect communication.

Indirect means of communication can be listed as below -

- Organising seminars, symposia, involving professionals from corporate world.
- Conducting case studies
- Matching the curriculum with industry needs.
- Experts from should be invited for curriculum development.
- They should also be invited for assessment of theory, laboratory and project work.
- Experts from industry should be involved in academic activities by inviting them as guest faculty and as emeritus Associate Professors.
- Students should be attached to industries for one year of training.
- Efforts should be made to get industry sponsored projects for graduate level student
- Sending the information on latest advancements, results of in house research work related to technology of concern to industry regularly.
- Arranging work shop & training programs on recent developments and efficient use of software tools

Such programs are established within departments, schools, and divisions in order to develop relationships with industry sectors whose interests closely align with their institute partner.

Over the time, these programs foster long-term research, training, placement, and philanthropic relationships between the University and its Affiliates to the benefit of both.

After executing these steps of building healthy relationship with industries one can find visit to industry of interest for analysis purpose very responsive.

Time required to complete one cycle of these activities may range between 20-30 weeks.

Sound Study

System analysis for a company can be carried out, either for finding asolution to problem or, to fulfill requirement related to system establishment/improvement, reported by the industry. In other case industry is already doing exceptionally well and management is keen to implement inovative ideas for improvement in existing system.

In the first case if the industry already is in search of solution to its problem/requirement then the search is confined that area of whole system. The problem can be solved by adopting following methodology

- Systematic listing of problem statement

- Determine whether the given problem can be solved with the technical expertise available in team, within the given time frame.
- If yes, detailed work/ cost proposal should be made along with distribution of work among the team members. For a good working relationship project participants must have a common understanding of the project and of their respective roles and responsibilities. To ensure this common understanding, a project agreement is negotiated and signed in each case.
- Once the project is approaved by concerned industry authrities next step is to collect the necessary data related to solutionof given problem. References of similar occurances can also be sought.
- Meeting of team members should be held to determine possible remedial measures.
- Thrust should be on finding permenent solution to the given problemrather than patch up work.
- Through analysis should be done to detect possible design flaws.
- Number of alternative solutions should be discussed and if necessary expert advice of third person may be sought.
- If not confedential problem may be discussed among students.
- After due discussion optimum solution among the different alternative should be reached, aggred by all team members.
- Advice note should be prepared to indicate the course of action as a remedial measure

This ends first phase of project involving technical consultancy. Separate proposal of work to be carried out to implement remedial plan may be submitted subject to availabilty of manpower, other required resources & time or it may subcontracted. (guidelines for preparing consultancy / project execution proposals is discussed later in this paper)

Second type in this category is industry is going well but there exists requirement to do certain work which may be –

- Site selection for new plant.
- Efficient plant layout.
- Optimizing material requirement.
- Design & development of entirely new product concept.
- Research oriented project
- Imparting training to industry personnel

Upon getting detailed requirement meeting of team members should be heldto decide which workable solution should be selected to start with, so as to complete the work within given time frame.

Comprehensive note should be prepared mentioning amount of work involed , money, manpower & material resources required.

Again the work should be divided into two phases one of preparation detailed techno-economic report and second turn-key project including execution phase. If the span of project is short & sufficient time is available then only executing the project should be considered.

The another case is to visit the industry of the interest even if there doesn't exist any problem or requirement at hand. This is the feature of efficient management which can be approached for requirement generation for the sake implementing innovative ideas of system improvement. Iin this case plant visit and analysis of existing system takes more time as whole plant is to be studied very carefully to find scope of improvement. It calls for many visits and discussions with concerned middle level management. All the findings are to documented neatly with suitable diagrams and should be verified. After detail analysis the findings sholud be discussed among team members to find out the area where the available expertise can be utilised to implement system improvement projeect. Once the area of improvement is finalised work to be carried out should be documented and output of the proposed system should be presented in the form of simulation, with the help of advancedments in the computers/softwares, to the top level management. Presentation should also elaborate quantitive advantages of the proposed system. After this manageemnt will definitely ask for detailed project proposal. Feedback from management should be considered in refining project definition. In next sub-section this aspect is discussed in detail.

Proposal Submission

The detailed proposal of the work that is to be carried out should be prepared with due care with appropriate estimation cost & time. All the work should be discussed among other team members, if any and division of work, renumeration should be decided in advance. The proposal should contain following minimum information –

- Covering letter of institute & team members.
- Findings, objective & gains of proposed system.
- Work definition.
- Profile of team members along with brief resume.
- Detailed time frame of project.
- Break up of project in different phases alongwith time in hours/days/weeks to complete each phase.
- Resources required for each phase.
- Requirement stating list of lison persons from industry.
- Detailed action plan.
- Necessary terms & conditions
- Costing
- Mainainance coast beyound contracted period.
- Validity period of proposal.

- Libilities.

Entering into agreement

Once the project proposal is approved by industry in principle next phase is to cost bargain, if necessory. Aggrement should be prepared with very carefully and team members and institute authorities should be taken into confidence before signing it. Full tranparancy is key to avoid further conflicts. Cost overruns, delay causes, necessary allowances, third party involvement should be given due considerations in formulating the aggrement. Necessary allowances & tolerance on time should be mentioned to account for urgent unforeseen academic/university work. Teaching should be never allowed to suffer on account of ex-tra revenue generation.

Executing work

Coordination among team members, good relation with industry employee, cooperation from industry and encouragement from institute authorities are key factors for success. High amount of managerial skill is required on part of academicians. It is advisable that academicians should undergo management training program. Help of experienced & highly professional persons should be taken whereever necessary for speedy completion of work. Involvement of meritius students may be considered to share some work. Even if in sub contracted work involvement of atleast one of team members is must to gain experience & for addressing future problems/improvement. For the timely completion of work, any change in project defination should be strictly resisted avoided and if necessary aggrement should be re-negotiated. Training should be given to user of the system and detailed documentation & manual should be made & maintained at site. Necessary instructions, precautions should be labeled over/ near the system. Maintanance manuals & schematic block diagrams of the system should also be prepared. All other work like list of critical components of system, life of components, replacement schedule of components should be done to ensure smooth working of project with minimum intervention & down time. In case of software project backup facility is must to preserve the critical data from virus attack.

Post completions follow up

This phase is must to maintain long term relation with industry. Regular visit to industry should be made to get feedback of system installed. Unforseen problems / hitches (like Y2K) in the system should be addresseed immediately. Improvement suggested by the user of the system should be addrressed withdue weightage. Students should be encouraged to visit the industry to analyse the system.

CASE STUDY

By following above stated method author has succefully executed project titled 'Real Time Production Status

Monitoring System' for 3P unit of UniLever group company situated at local industrial belt. Following is the briefing of the work carried out.

- Automation based system with the purpose of productivity improvement involving sensor, PLC based based system with computer interface & allied software development was identified as area of interest.
- Necessary literature about aadvancement in this area was collected.
- Group of three members including author was fdormed based on common interest, area of specialization like system analysis, GUI design & software development.
- Area of North Maharashtra University regeion has maximum population of process type industry & ample scope for PLC based Supervisory Control & Data Acquisition SCADA system can be found in these

type of industries. To start with it was decided to work on data acquisition sytem initially.
- Detailed study of the plant was made to find scope and we were succeded in generating requirement of real time production monitoring system for a plant operating at the efficiency of 92-97 %. The demo of the system will be presented at the end.
- Simulated GUI screens were demostrated to board of directors and approaval of the project involving proximity sensors to count production of boxes & batched, PLC, its computer interface & software to visualize production was sanctioned principally.
- Formal project proposal was made & aggrment was reached to execute the project
- Project was executed in two phases over the period of one year with the delay of three months.