

# **Bridging the Industry-Academia Gap and Knowledge Management: Need of Hour**

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## **Abstract**

Industry-academia interface has always been under extensive discussions in many ways. A developed common area of interest strengthens the relationship between universities or research institutes and industry in a bigger resolution and on a precise basis between scientists and professionals in industries. Management of knowledge and communication makes a sense of newer outlook of the hydrocarbon sectors. To boost the growth of oil and gas industry globally, trained workforce and continuous strategic methods are needed which is only possible through mutual conjunction of academic and industrial human resource. Shortage of high quality collaboration in reality climbs list of discussions these days. This article gives an insight on bridging the gap between academia-industry interaction for a better way of the look of oil & gas industry scenario. The most core sector of a research institute or a university is its teaching. Many of the institutes have really phenomenal high-end applied courses which is the subject that fascinates the industry. Industry looks for human resource with proper dimension of knowledge in the field. To rectify the theoretical knowledge into the practical industrial problems proper training is needed for the newly recruited trainee. The trainee plays the most important role in this system to establish the academia-industry relation. More and more involvement of undergraduate students with the industry makes a proper hit to reduce the gap. Another part of interest for the industry is the really outstanding faculties and scientists who are doing globally acclaimed research in the field of hydrocarbon and its sciences. Along with betterment of corporate level strategies industries need to have technological advancements, which are largely benefited by growing research. So, extensive collaboration with cutting edge researchers working on applied sciences is expected. In addition government should have a proper assistance for the synergy between academics and industry in the oil and gas sector to fuel the need of the hour.

## **Introduction**

The beginning of 21<sup>st</sup> century is witnessing the advent as well as the necessity of a new knowledge-driven society and a quantum leap in higher education. Higher education refers to a level of education that is offered at academies, universities, colleges, seminaries, institutes of technology, and certain other collegiate-level institutions, such as vocational schools, trade schools, and career colleges, that confer academic degrees or professional certifications. There is a rapidly growing demand for a higher education in the today's world because it serves various important functions in our society, the foremost being creation of knowledgeable individuals who will provide service to the society.

## **Industry and Academia**

Academia is the collective term for the community of students, faculty, and scholars engaged in higher education and research. The word comes from the Greek referring to the greater body of

knowledge, its development and transmission across generations. Academia in the context of universities definitely possesses the research ability and motivation, as well as experience, in delivering the essence of education through courses and workshops to large sections of a population.

Industry refers to any type of economic activity producing goods or services. It is part of a chain – from raw materials to finished product, finished product to service sector, and service sector to research and development. Industries, the countries they exist in, and the economies of those countries are interconnected in a complex web of interdependence. There are four main industrial economic sectors: the primary sector, which is largely involved in raw material extraction industries such as farming, mining, and logging; the secondary sector, which is involved in processing products, refining, construction, and manufacturing; the tertiary sector, which deals with provision of services (e.g., law and medicine) and distribution of manufactured goods; and the quaternary sector, a relatively new type of knowledge industry which focus on technological research, design, and development such as computer programming, and biochemistry.

## **Need of industry-academia collaboration**

Industry is the engine that generates the tax base for government revenues and strengthens the economic viability of a population, city and country. Industry can also provide the basis of the problems and opportunities for application of university borne new technology or innovations that can be the prime focus of academia-industry collaborations. Large scale industry has the required resources to invest in the initiatives of new technology development, but it often tends to depend on bought out technologies, generally from the foreign countries. Academic intervention may be needed only in minor technological innovation or modification focused at technology absorption or implementation. Medium and small scale enterprises are a special aspect of industry that comprises the vast majority of businesses across the globe but they do not have the required resources to explore concepts and remove uncertainties of survival.

Indian economy was being integrated into the world economy. As any other ambitious society, India also started placing great importance on commercial activities as a catalyst to socio-economic development. Resurgent India sees wealth creation as a great equalizer amongst all sections of the society. In such a scenario a knowledge worker who can work at the cutting edge of technology, add value to the bottom-line, and provide competitive advantage to industry has become a hot commodity to acquire. With globalization and liberalization, the job market has become even more competitive than it was years ago. The competition is rising exponentially day by day due to several factors, which includes requirements of specialized work force, unemployment factor etc. Now, a person not only has to compete for a job with the people from his own community or country but also with the people who emigrate from other countries.

So what is it that will distinguish one from all other competitors? Of course it is one's additional skills, knowledge and a college degree. Indeed, many of the Indian universities have failed to fulfil this purpose. The recurring demands of skilled and specialised manpower from the industrial sector are not being met as a large section of graduates lack the necessary critical thinking and analytical skills required by the industry. Nowadays, a vast majority of higher education planners and academics, throughout the globe, has been trying to link universities and other research institutions with industries. Universities can boost the value of products in the form of knowledge; industry can supplement the value of university in the form of funds. The National Policy on Education in India has put great emphasis on the need for university industry interaction. However, in spite of so many efforts undertaken by the Centre and State governments, university industry interaction has failed to prove a noticeable progress up till now. It still remains superficial and limited to a few premier institutions.

## **Barriers of industry-academia interaction**

Though the principle of academia-industry interface has been adopted by concerned private and government agencies in the past years, its full potential is far from being utilised and cultured for benefit of the two.

#### A. From Government

Government is often too sluggish and generally not flexible enough when dealing with academia-industry collaboration as it is often not entrepreneurial by nature and troubled by bureaucracies. Personnel are often devoid of desired quality and compassion. Delay in funding to the research institutes, delay in payments to the research students under different central government research schemes are very common in present times. An extremely large amount of reporting is required along with little ICT (Information and Communications Technology) domain knowledge. This will be beneficial for future planning to tackle the issue and for further aggravate collaboration.

#### B. From Academia

This may be of great controversy but unavoidable at times that the academicians (professors, lecturers etc.) have widespread indifference towards applied research and they are reluctant to leave the comfort zone of pure teaching. Academia as represented through universities is generally inflexible when dealing with collaborative projects and typically present additional levels of restrictive internal policies and procedures that hinder innovation. Academia is largely unaware of the real industrial and national needs and unable to market its strengths to industry adequately. Other inhibiting factors are lack of appropriate incentive to faculty and specialized technical infrastructure (R&D Lab.), absence of proper recognition for practising faculty as compared with pure academics worshipper, bureaucratic hiccups in utilisation of consultancy funds, absence of exclusive university-industry interaction cell in campus etc.

#### C. From Industry

Industry, by nature, is always interested in targeted development. During its interaction with the academia, industry's desired time frames are instant, and investment is guided by efforts that yield result-oriented solutions. The costing frames are typically directed by reluctance to invest in its internal R&D which has either long term or unclear output. The other factors which hinder its interaction with academia are insensitivity to, or lack of cognizance of, the tons of resource potential of the academia; much dependence on easily available foreign know-how; an unhealthy obsession with expensive, eminent professional consultants; earlier bitter experience of interactions with the academia; obligations of on-going technical collaboration agreements; anxiety to keep secret information of failure or success, confidential for fear of losing the competitive edge etc.

### **Towards the integration of Industry and Academia**

Academia-industry relationship is not like that of technology donator-acceptor, but is of interactive and collaborative nature, acknowledging and ensuring mutual respect for each other's role and contributions with an eye to attaining the true purpose of such relationships, namely, bringing about research-outcome synergy. Indeed, academia-industry interactions are a system that requires active and collaborative participations of all the stakeholders. Present-day endeavour on academia-industry interface in India is limited to a narrow range of activities. Therefore, to strengthen academia-industry interface, different types of collaboration and interaction initiatives are needed to be implemented, monitored on a regular basis and further scopes of improvements are to be identified and incorporated in the system as well to build a fruitful and successful industry-academia relationship.

Here are few steps, which have been identified by the previous workers and organizations working on the same issue of bridging the industry-academia gap

- Creation of chair
- Provision of incentives
- Foundation of Centre of Excellence and Relevance
- Diffusion of Knowledge through Interaction of Peers
- Involvement of Alumni as Mentor of Students
- Pulling Top-Notch Talents to the Faculty Pool
- Setting up interface structures
- Academia-Industry-R&D Lab Consortia
- Cell for Entrepreneurship Development and Technology Incubation
- Formation of a National Knowledge Network to Connect Institutions
- Facilitating Flow of Technology from Laboratory to Market Access
- Enhancement of Technology Transfer towards Commercialisation

- Creation of Research Park to Encourage Growth of Enterprise
- Setting up of Venture Funds to Support Innovative Entrepreneurship

To encourage academia-industry collaboration tax exemption for all expenditure on R&D where industry and academia work together could be given and service tax for any royalty coming out of technology transferred by an academic research institution to an industry could be exempted.

Students' exposures to industrial practices through internships are to be made mandatory. The student internships are also to be made more meaningful with feedback mechanism and long term so that both students and industry are benefited. This would also facilitate the industry to plan and structure the internship programme keeping pace with the academic curriculum. "Exposing students to the world of work plays two related and essential roles.

Alumni working in various industries can act as mentor for Indian students to provide guidance on improving employability skills, placements, knowledge of global business trends, overseas opportunities in business, and information of technological advancement etc. delivering lectures in their respective institute. Alumni can also raise a fund to support the entrepreneur skill among the interested students with feedback mechanism under special terms and conditions.

Government should take initiative to open various entrepreneurship cells in academia and it should be included in the curriculum to enlighten the students about the requirements of society and industry as well as freedom, challenges, and sphere of entrepreneurship, so that they can be interested to emerge as an entrepreneur instead of being entangled in the conventional jobs. This will provide a creative thought, risk taking capacity, and enthusiasm for accomplishing down-to earth problems in the young minds of the students.

Intensive programmes under Visiting Professorship scheme should be created for regular visits of resourceful persons from industry to address students, academic, and scientific staff and to involve them in teaching or research during their short stay in the premises of the institute. An expert from industry, with several years of job experience should be given the status of a Professor. He could be called as a Corporate Professor, so that the individual may also earn due recognition from all concerned.

With the object to focus on key and strategic areas of research and to provide adequate funding to research that keeps pace with market needs or market-driven R&D, several appropriate programmes are to be adopted. During the evaluation process the commercial viability of the research output should be given the prime importance for approval, besides technical feasibility. The rearrangement of the various R&D grant projects in India may also be orchestrated, tending to streamline the objectives and management of the present grant projects under one management body.

## **Discussions and Conclusions**

The world has moved from industrial revolution to knowledge revolution and from industrial economy towards knowledge economy. Global economies are gradually getting interconnected in this changed situation. Keeping pace with this change, R&D is crossing national boundary.

With a goal to make India the global powerhouse in research and innovation, a new range of technology is required to meet the future challenges, and India has to head forward on innovative collaborations between industry and our universities through cooperative knowledge creation and exchange. Although cooperative research is the key word to fill the gaps existing in the present structure, there is a tremendous need to create other avenues that need to be intensified, stimulated, and above all integrated, for a close academia and industry interaction through all the stages of technology development, starting from conceptualization down to commercialization. In spite of some shortcomings and inhibiting factors with respect to the academia-industry collaboration, government should put into place an integrated policy of academia-industry collaborative interaction encompassing a number of strategies enabling such an initiative to thrive in the country's quest for technological leadership.

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