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RESEARCH ARTICLE

INDUSTRY – ACADEMIA PARTNERSHIP: THE MOST VALUED RESONANCE INDUSTRY - ACADEMIA STRATEGY FOR INNOVATION TO STAY AHEAD

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ABSTRACT

With the rise of a global knowledge economy, universities and industry pool resources. This has resulted in a piling on the need for strategic alliances that go beyond the customary funding of distinctive research endeavours. Top notch research universities are at the facade of pioneering such collaborations. Such universities are intended to trot extensively by added investment, clearly stated visionary objectives, and pound the competiveness of industry, universities and vicinities. Such exertion by universities renovates the task of research universities for the 21st century, putting back into working order as central nodal centre of competence to help confront challenges and bring out research outcome coadjuvancy. This paper examines various roadblocks of joint forces of academic institutions and industry with focus on the temperament of resources and immanency of the stakeholders from the perspective of contending knowledge. This paper also investigates barriers of industry-academia interaction. It recognises credible areas for constructive symbiosis of industry's participation with academia. Lastly, this paper charts down primarily for the Indian set up the proposition of integrative retreats of new possible collaborations to reinforce of industry-academia periphery.

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INTRODUCTION

The break of the day of the 21st century has spectator the commencement of knowledge driven economy and a transilience replacement in higher education. Higher education is a level of education of wider access and the endorsement of specialised knowledge, and design to suit local demands for open minded education, practical professional training and service to industry. The demand for higher education has matured today with an assortment of functions that endow with service to the society. The competition in the job market has evolved due to globalisation. A candidate has to compete for a job with others from his own country as well as those who emigrate from other countries. So the seeking skill attributes, acquired knowledge, academic qualification i.e. a degree make a distinction for competition.

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Indian universities have not fulfilled this rationale. Graduates lack angle of critical thinking, logical ability and analytical skills needed by the industry that directly affects the stipulation of skilled and specialised manpower from the industrial sector. Various universities which are teaching focussed, research oriented, professional training planners, throughout the globe, today work by linking with industries. Industry-academia periphery works just like craft workers of the past, knowledge workers engage in peripheral activities that could be done better or more efficiently by others. This is intensified for provision and innovation in respective industrial domains. This is aided via consultancy, scrupulous research. Industry, academics and the government are to take indication from surrounding environment in order to achieve cross business synergies. The numbers of connections and their content have a relevant role in bringing out unique mind set which help industry-academia to coevolve by simply presupposing that links among business units are temporary. So more efficient links and less agile links is the key towards planning

collaboration's coevolving between industry managers and university researchers or consultants. For such practices, context is laid down for emergence of collaboration along with competition from various business units. Business units of coevolving industries-academia are apprised for individual performance, not for collaboration. Therefore, collaboration takes place only when two business units, here industry-academia as two individual business units, employees both realise that their linkage makes sense for their respective businesses. Such synergy results in cooperation, collaboration and facilitation amongst each other of industry-academia in order to act upon global economic challenges. This is a must for economic viability and development of the country. A large number of industry-academia projects remain underachieved from business standpoint i.e. the outcomes did not make their way into products or processes. The capability for impact is enhanced if there is industry-academia communications which involves design, development, manufacturing, marketing etc. There is an outcome impact gap in university collaborations. Promising outcomes of university projects often fail to translate into tangible impacts for the companies involved.

Status as of today is that only a few premier universities are working in collaboration with some industries. Publically funded R&D generates fewer inventions and patents. This happens as a result of less systematic and professional administration of knowledge and intellectual property by Indian universities. The knowledge transfer in research universities gets thwarted due to cultural differences between science and industry communities, lack of incentives, legal barriers and fragmented markets for technology and knowledge. Growth and job creation gets intricate by all these factors. Universities and other research institutions are realising their changing role in today's economy. They realise that are not just to provide graduates but they also find themselves competing on a global scale for students, researchers and industrial patterns. In order to attract students and researchers universities will need to open up to industry and international collaboration. This will help leverage new funds. R&D collaborations with industry get in action through knowledge sharing in particular. Potential source of income for research universities will boost the quantity and quality of the research undertaken. Knowledge based job task begins with mapping the tasks currently done by people handling that job. Such map suggests tasks and subtasks which are to be performed with higher quality, at greater speed, or at a lower cost by a specialised resource. Industry has to take into consideration social issues and not just the economic ones. Adequate academicians are required to cope with the agenda that the country wants to set. Policy for industry-academia interaction is to be designed solves this further.

To avoid partiality of industry-academia relationship, numbers of experiments are to be designed to provide evidence to support the policy suggestions. Innovation facilitates quality and service which improve when more of the work that goes into the final product is done by people who are good at it. This improvement is greater when people who are good at work compete with one another to get it. So the academia, industry and government must create an open innovation marketplace to intensify industry-academia further for the birth of sustainable innovation at diverse levels with all degrees. This would require a commitment to intervention, education and a form of partnership between the central or state government and the industry enterprise to deliver social goals. Crucial to knowledge subdivision, is to understand the flowchart of dependencies among industry-academia tasks and ascertain their management. This set up of knowledge exchanges need to continue even after the completion of contractual research project.

INSTRUMENTS AND PROSPECTS OF STAKEHOLDERS

A. Role of Industry

Innovation does not happen in a vacuum: A context – the economy, society and policy – shape how easy or hard it is innovate. Policymakers set that context. Throughout our interviews, the role of government was 'the elephant in the room'. No professional R&D manager, on either side of the university/ industry divide, was in any doubt that politicians are important. And while their opinions differed on some points, on at least a few key issues a clear message emerged [Gail Edmondson et al., 2012]. Critical areas are to be dealt with during industry-academia working. These include the issue of sharing intellectual property rights, pace of the execution of industry projects at the universities, articulate policies enabling such research with tax incentives, for industry to invest in industry-academia collaboration and a integrated model in universities for enthusiasm, assistance, reward entrepreneurship.

This requires institutionalization of different mechanisms for fast track procurement procedures, for speedy use of funds so to apply for mutually agreed purposes. Industry-academia collaboration gets further assistance for industry scientists to be able to work in the university environment for extensive time periods. Government funding should support defined duration of visits by the interested industry personnel to the universities to yield successful outcomes. In the current practices of industry-academia collaboration, the emoluments provided to the industry personnel are too little, compared to the compensation provided to them by their parent company. Industry is to be encouraged to recruit research trained graduates (PhDs) for employment in their companies for general purpose jobs or for R&D. There has to be investment from the industry in major joint research projects with the universities. For investment in R&D the government can allow some tax exemption to the industry. University students require entrepreneurial nurturing by the industry also.

B. Role of 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. By

"university" we understand a corporation of people entrusted professionally with the invention of knowledge – research, on one hand; and in the dissemination of knowledge – teaching, on the other [Greenwood and Levin, 2001; Muller and Subotzky, 2001; Rowley, 2000; Kogan and Kogan, 1983]. Academia is to create unbiased environment. Diverse work teams have better capability to do risk involving research. Industry-academia engage in research joint ventures, academic literature focus, university start-ups, knowledge transfer, joint publications with industry scientists and consultation. Personal financial gain, securing additional funding for physical and human capital for additional experimental research are the main motivating factors for university scientists. For this motivating tools are laboratory facilities, graduate assistants, and post-doctoral fellows. Manifestation of norms, standards, and values of scientists are detectable in the value creation, innovation, individual's contribution to advances in basic research.

A balancing act by the academia influences the rate of invention disclosed and the stage at which researcher discloses the very invention is directly related to economic reward from permitting and the faculty quality. Scientific fields, institutional factors and cultural norms are critical factors that have a clear impact on the perceptions across scientific fields on the outcomes of patenting. Physical scientists patent so that they can have freedom to publicize their work to avoid the fear of losing potentially valuable intellectual property rights and to gain leverage with the university. Life scientists are bothered about the proprietary benefits of patents so as to use them to leverage with industry. Faculty attitudes and decisions to patent are impacted by the institutional success in knowledge and technology transfer and the perceptions about ease of working. Outcomes of research collaborations between the university scientists and industry scientists at the level of individual researcher aid to the assessment of university and scientific teams. Extensive basic research has testimony in scientific papers published by researchers at the top research universities. Team size is measured by the number of authors on one scientific paper. This measure provides team size and rate of collaboration in such a manner that whether they have increased or not in the previous decade or two.

C. Role of government

Generally government gets to be slothful and slow moving unyielding enough when policy is to be framed for industry-academia collaboration. This happens as currently science, technology, engineering and mathematics (STEM) graduates are not entrepreneurial by nature. Despite a vast industrial sector there is a consistent pattern of the highest rate of unemployment amongst recent graduates and they have 35% non-professional roles. Practically academia are run by government aid and academics are paid by government through university employment. Besides having the money, governments further have the capability to track and account for funding and its meaningful application. Moreover, government has also the ability to identify more societal needs across the globe. A very significant role for government lies in generating a "buffer "within which disadvantaged groups can be nourished and benefited accordingly. Usually government cuts across a wide swath of industries and is reasonably consistent with fewer annual ups and downs than often happens in business [Vinay K. Nangia and Cashmira Pramanik, 2011]. The Information regarding funding and the application is reported which contains random information that remains under-utilised for processing. An extremely large amount of reporting requirements coupled with little ICT (Information and Communications Technology) domain knowledge further aggravate collaboration [Vinay K. Nangia and Cashmira Pramanik, 2011]. Manpower is not rounded, grounded, ready to work and lack experience in the workplace. Delay in funding, location, infrastructure, interference by senior leaders for utilisation of machinery equipment, software and many other control practices hammer the enthusiasm of employees working on industry-academia projects. In this decade of the 21st century industry have direct impact on countries, communities. A country's government therefore got to have policies for the industry with mandatory corporate social responsibility in relation to industry's role to impart training, role of university board and faculty in collaborating research with industry without government ministries.

COALESCING PRACTICE AND THEORY

Logistics programs, while not immune to such reprehension, are addressing these concerns by accentuating research conducted jointly with industry. Many logistics programs already relish vigorous industry involution in curriculum development and internship opportunities. Faculty in these programs become intimately acclimated with the concerns, intrigues, and quandaries confronted by logistics managers practicing the discipline. This familiarity enhances the pertinence of research and avails engender funding. By collaborating with business managers, faculty members gain access to conceptions and data that lead to publishable research, which furthers erudition in the field. Sharing results of germane research in the classroom provides faculty with a consequential denotes for transferring cognizance and experience. Academic research has been trending toward fostering interdisciplinary research and collaboration outside the lab, resulting in buildings with increasingly generic wet lab space fortified by highly flexible non-lab workspaces that support sundry modes of working, as well as highly specialized core facilities predicated around a concrete technology or field of study that are typically shared by multiple departments and across disciplines. These state-of-the-art facilities can be leveraged to magnetize private industry for a wide range of partnership models - from transaction-predicated partnerships to long-term, focused research collaborations. Business incubator programs are ideal for mid-to long-term partnerships that reach beyond the Technology Transfer Office. This partnership model is additionally an efficacious springboard for start-up or spin-off companies that result directly from in-house research, sanctioning the incipiently composed business to maintain a link with the university as it matures. Providing a residence for businesses within the academic campus sanctions industry professionals to become embedded in the research setting with access to labs and equipment, while giving researchers and students direct access to industry professionals, building a network of cognizance and collaboration that is mutually salutary. Long-term strategic coalitions, focused

around a categorical area of study, carry the greatest peril, but have the greatest potential for impact.

The opportunity subsists for academic institutions to partner with private industry at a variety of scales, including sizably voluminous corporations, minuscule businesses and non-profit organizations, as well as regime agencies under a consortium of parties that share a prevalent set of goals. This model has innate efficiencies, engendering transparency between entities, pooling resources, breaking down barriers to perspicacious property rights and streamlining the process of bringing research results from bench top to market. The physical setting for an immensely colossal-scale research effort involving many parties can vary from multiple concurrent settings that include university labs, corporate centres and national labs to a single dedicated research campus community. The partnership model engenders a framework for the rapid and open exchange of information between parties with a shared vision and goals.

The prosperity of the open source concept of development in computer science has led to its adoption in other fields as an implement that can be leveraged by both academic institutions and private industry to partner with each other in incipient ways. Open source research models have the potential to democratize innovation and revelation by linking together academia, industry, regime agencies, philanthropic organizations, NGOs, private investors and individuals across the globe. Integrating Internet-predicated concepts such as crowd sourcing and crowd funding can accommodate to further expand the reach and impact of research. For example, the drug industry is currently experimenting with open source research networks to facilitate drug revelation. One such network, Open Source Drug Revelation (OSDD), predicated in India, has assembled over 7,000 participants to research and develop drugs for neglected tropical diseases including tuberculosis and malaria.

BEYOND THE CLASSROOM

The benefits students receive from these industry-academia programs go far beyond those that emerge from classroom lectures and textbook case studies. Instructors who cite current, pertinent research results are able to provide undergraduates, graduate students, and executives with direct examples of theoretical concepts applied to the authentic world. Graduates then enter the work force possessing leading cognizance regarding logistics principles and concepts—how leading firms manage inventory and conveyance, what accounting procedures they utilize, and what enabling technology makes it all possible. Hopefully, they become managers who are cognizant of the value of higher edification and are committed to hiring others from the program. In integration, graduates leave school with an appreciation for university-industry relationships and become inclined to participate in interactive activities such as academic research. This spiral effect provides long-term benefits to all constituents of higher business edification. From a practitioner's standpoint, interacting with academia affords managers a chance to guide the direction of academic research. Partnering with academia withal provides managers with access to leading-edge cognizance culled from a cross-section of top firms. Such research is often disseminated in trade publications, professional meetings, and executive inculcation, further enhancing the image of participating firms. Moreover, research findings influence classroom edifying, subsequently inculcating current and future employees. Managers working on joint industry-academic research teams with faculty and students gain insights that may influence future hiring decisions. Academic-industry interaction provides a substructure for abstracting the barriers between educators and business practitioners in a win-win environment. As in any relationship, diminutive, positive experiences often grow into more preponderant commitment and trust between the partners. With perpetuated prosperity, partnerships between academia and industry may become the expected work environment-rather than unique exceptions-for incipient faculty, managers, and students. Logistics educators and practitioners must step forward and lead business schools to this incipient model. Hopefully, along the way, they will realize the paramountcy of logistics programs to the prodigious number of business schools, faculty, and administrators.

Industry-academia framework for global integration includes the following:

- *Adaptation* gets hold of revenues and market share by maximising a business' local relevance.
- *Aggregation* endeavours the upsurge of regional or global operations to deliver economies of scale. This requires grouping of the development and production processes.
- *Arbitrage* occurs when the differences between national or regional markets are utilised, by situating supply chain's separate parts in different places. For instance call centres in India, factories in China and retail shops in Europe.

KEYS TO SUCCESS

The success of any partnership depends largely on several key factors that are as follows:

- Develop a shared vision that clearly identifies the purpose and goals of the partnership and provides a framework for all involved parties to follow.
- Identify leaders who are capable of crossing boundaries between business and academia to foster strong ties between parties.
- Erode boundaries between entities by facilitating communication. Create a shared platform for the exchange of ideas and information.
- Establish a clear agreement for the use of resultant intellectual property. This remains one of the biggest hurdles to overcome for the success of a partnership. All parties can maximize the benefit of the partnership by agreeing to a shared set of expectations that are well-defined and transparent.
- Invest in long-term relationships. A long-term relationship allows parties to share risk and accountability without overburdening a single entity. Under a shared vision and a foundation of mutual trust, a long-term partnership can reap great results by building a body of work over time.

The world has peregrinate from industrial revolution to cognizance revolution and from industrial economy towards

cognizance economy. Ecumenical economies are gradually getting interconnected in this transmuted situation. Keeping pace with this change, R&D is crossing national boundary. India, with its Brobdingnagian pool of technical graduates, is facing incipient challenges. They are genuinely the country's greatest resource and have brought opportunity for India to grasp the ecumenical economy. The quality of products of abysmal economic value will hereafter be erudition - predicated, requiring very inhibited capital unlike the traditionally manufactured industrial goods that need investment of astronomical capital. What is cognizance economy? A widely accepted definition could be that erudition economy is characterized by the highest number of the well-trained, productive individuals. In other way it can be verbally expressed that, much learned, research-minded human capital of the ingenious class is the bedrock of the erudition economy. In the state-of-the-art era of erudition driven economy, a productive interface between industry and academia is a critical requisite. In the proposed paper an endeavour has been made about cognizance sharing, erudition transfer, and transfer of experience and technology between academia and industry.

DISCUSSION AND CONCLUSION

With a goal to make India the ecumenical powerhouse in research and innovation, an incipient 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 erudition engenderment and exchange. Albeit cooperative research is the key word to fill the gaps subsisting in the present structure, there is a tremendous need to engender 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. Other avenues for tie ups are achievable and can be well explored. The most paramount aspect is that such tie ups acknowledge and capitalize on the relative strengths of the academia and industry. Besides industry sodalities, the universities should withal form linkages with regime agencies which are entrusted with industrial development activities. In spite of some shortcomings and inhibiting factors with reverence to the academia-industry collaboration, regime 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.

To evade partiality of industry-academia relationship, numbers of experiments are to be designed to provide evidence to fortify the policy suggestions.

Experiment list is to firstly include industry's contribution to impart training or absorbing faculty in their industry for certain duration.

This shall be Corporate Convivial Responsibility (CSR). Secondly, faculty training with national or ecumenical industry still needs to be facilitated. Reason being that the faculty so trained that they are a component of hub resource (compulsory bond) to evade faculty turnover from academics to industry. Both the Industry and Academia are just like oil and water because they have very different goals. Researchers are striving to find the Innovations, and somebody working in the company is striving to find the profit. The researcher wants to disclose his findings to wider world for the betterment at the ground level, and the company doesn't necessarily want that. As such the need of the hour is the miscibility of both the ends to resonate for a common cause – Learn & Earn, otherwise the ship of the Economy would soon lose all its nuts of Knowledge and will have no option but to sink, thus halting the normalcy to a standstill, thus depriving us off the heaven of adjustment which mankind always dreamt of.

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