RESEARCH Newsletter
of the Research & Publications Committee, IIMA
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For further information, contact us at
Research & Publications Committee
Indian Institute of Management
Ahmedabad 380 015

Phone
91-79-6632 4821

Fax
91-79-2630 6896

email
respub@iimahd.ernet.in

Website
www.iimahd.ernet.in/publications

Chairperson's Message

Dear Readers,

The *Research Newsletter* of the Research & Publications Committee of the Institute is now in its eighth year of publication. In this issue we have included an interaction session with Prof. Uday Karmarkar (LA Times Professor of Technology and Strategy, UCLA Anderson School of Management) on issues focusing on Operations Management. We also have a few research study summaries by Prof. Ajeet Mathur, Prof. Amit Garg and Prof. P.R. Shukla. In the last five years, a number of IIMA faculty have published several articles in national and international journals. Details of some of the distinguished publications as per our list of "A & B" grade publications are included in the newsletter.

As my tenure comes to an end, we look back at what the Research & Publications Committee has accomplished in the last three years. I am very happy to report that we have revised the Research & Publications Manual, a task that was not attempted for almost ten years. We have increased the financial limit for research projects undertaken by faculty. Projects not finished on time gets automatically terminated after one year. Another important activity started during the period was the Research Proposal Writing Workshop. About three hundred research scholars from different parts of the country had participated in these workshops in three years. I hope this will continue in the coming years. We have also added a new activity under the R&P Committee - summer internship projects - to facilitate the use of summer interns by faculty for their research work.

I would like to thank the Institute for giving me the responsibility as Chairperson of the Research & Publications Committee. I am thankful for the support I received from all the members of the R&P Committee during my tenure. I am extremely grateful to the reviewers who helped us in peer-reviewing project proposals submitted to the Committee. Comments and suggestions received from the reviewers were of immense help to the Committee and made our job easy. Thanks are due to Prof. Arnab Laha, Coordinator, Mr. E.V. Narayanan for providing administrative support and Ms. Pratima Desai and her team for designing the newsletter.

Finally, I end with the famous quote of Mark Anthony in Julius Ceasar, " The evil that men do lives after them, the good is often interred with their bones, So let it be with..."

Goutam Dutta

"**Goutam Dutta**
Chairperson
Research & Publications Committee

Dr. Goutam Dutta had a fruitful interaction with Prof. Uday Karmarkar, LA Times Professor of Technology and Strategy, UCLA Anderson School of Management recently.
Prof. Karmakar shared his views in the field of management with a special emphasis on Operations Management.

What, according to you, have been the major developments in the field of Management (especially Operations Management) in the last two decades?

In the Operations Management field, we seem to be stuck in a time warp. Advances in understanding manufacturing and service networks are incremental at best. Information chains (an area of central focus for our research at Anderson) are almost ignored. And yet, our research shows that advanced economies are already dominated by information intensive sectors and all major economies by services. In industry too, IT systems like ERP seem to have brought progress in operations management to a standstill. Transactional systems, data management, the holy grail of "integration", and various kinds of reporting methods (dashboards, business intelligence, supply chain visibility) appear to be dominating the operations scene to the detriment of a better understanding of operating dynamics, decision making and competitive advantage. We still use flawed models like MRP, that haven't changed since the 1960's. Our BPR tools, which rehashed good old systems analysis, have indeed improved standard work flow management at low levels. But they haven't advanced much in a couple of decades, and they don't work well for services and collaborative production.

We see a lot of repackaged concepts like Six Sigma which is essentially a partial rehash of TQM which in turn was heavily dependent on traditional SQC. Six Sigma is a quality initiative that looks less Japanese, and so was more palatable to US firms, but it hasn't added very much to TQM or SQC. In a similar vein I don't see much that is very new in lean, agile, or robust manufacturing relative to ideas like JIT and Kaizen that preceded them. The vagueness in these terms helps to hide the lack of new content. Again there's a lot of repackaging and rehashing going on. Now these concepts are being transferred blindly to services, without much thought about whether they actually fit. It is especially discouraging to see academics use these terms without any clear definition of what they mean.

What according to you would be the main research areas in Operations Management in the next twenty years especially in India?

In developed countries, our research demonstrates that economies are evolving towards "information intensive services". This is already the biggest component of the US economy, and yet there is little research on the management of operations in this area. Academic research is still overwhelmingly directed at traditional topics like supply chain and production, even though in the US, this is a shrinking field. Our BIT project at UCLA is entirely oriented towards the information economy, and we partner with a network of 20 leading research institutions around the world.

For India (and developing economies) the picture is vastly different. The biggest source of wealth creation in the next few years will be the growth of manufacturing for both Indian and foreign markets. However, the biggest source of jobs and income for the vast majority of Indians will be the physical services sector that includes transportation (including rail, road, water and air), distribution, wholesale trade, retailing, construction, hospitality and leisure, site based services (parking, security, maintenance), equipment based services (such as repair), and so on.

To make the point clear: manufacturing can create wealth, but it will not create enough jobs. So it is crucial for India (and China) to grow the service sector. The big challenge for both countries is to move workers from agriculture to physical services. This is happening in India, but probably not fast enough. As an aside, this shift will be accompanied by urbanization and the growth of towns, which will demand substantial infrastructure creation at a local level.

For India and developing countries, the information intensive sectors (including media/entertainment, telecommunication, software, IT enabled services) will be increasingly important further in the future, and will be very visible from now, even though they are not the biggest creators of jobs and not the biggest part of the economy as yet. They are important because they act to catalyze economic improvement, and add to India's reputation and visibility at a global level.

Operations management has a huge role to play in all these areas: manufacturing, physical services and information intensive sectors. The most important role for academic institutions will be in the education of managers at all levels (from supervisory to the C suite), who are able to be effective in the high growth period that we will see in India.

How are the challenges in Operations Management for companies in India different from those faced by companies in developed economies?

It is not so much a matter of different challenges, as different sectors. For example, the retailing sector in the US is very well developed and very large at $2.5 trillion or more in revenues. Some of the biggest companies in the US are in this sector (e.g. Walmart). In India, retailing is just getting off the ground. Some of the big players in India (Reliance, Birla) understand the potential here very well and have already made large bets. Along with retailing, I have mentioned the other "physical services" that will be a key for India. So will manufacturing – in contrast with Western developed countries, where it is shrinking.

But to reiterate: while wealth creation may come from many sources, jobs (and wealth distribution) will come from the physical services that I have mentioned above.

I would also reiterate that the major issue for India is education. The biggest problem for Indian companies and the economy is a simple matter of numbers. In the US, less than 2% of the working population is engaged in agriculture while over 80% work in services. In India most workers are in agriculture. So the first problem is of course, to negotiate the move of workers from agriculture to services. Then the issue will be to train workers as well as managers for the service sector. To a lesser extent this will also be an issue in manufacturing and in the information intensive services.

For every million people working, there must be at least 100,000 first level supervisors, 10,000 middle managers and 1000 senior managers even for small companies. Of the lower level positions, many will be operations related. Scale up these numbers to the level of the total workforce and it means that tens of millions of management positions will have to be filled, and hundreds of millions of workers trained.

How do you compare the research capabilities of Indian institutions in Operations Management with those in others in Asia?

The best institutions in India are quite good and there are individuals who are world class. But the majority of institutions and individuals are not very good and many are terrible. However, I see the research problem somewhat differently. I believe that Indian institutions need to focus on research that is close to practice. A good test for research projects would be: how many of them are supported by industry, not where they are published.

In spite of India being a fast-growing economy, why do you think Indian CEOs do not repose much faith in scientific modeling / decisions making in Indian CEOs? Do you think one reason could be our culture?

The needs of a growing economy in the middle of radical change are very different from those of mature economies already operating at a high level of performance and income. The latter must create jobs that support a very high standard of living. Consumers too are willing to pay more for more sophisticated goods and services. The developing and rapidly growing economies (like India) need much more basic skills in management, and must operate in a much more cost sensitive way for their customers. The need in India is for mass production with adequate quality and low prices – the Nano, not the Jaguar. This requires good operations, and a focus on effective practice, not abstract research aimed at journal publication. Of course, the best and largest Indian companies can appreciate and use advanced methodologies. In many areas, they are already world leaders; software development practice is one. But there's room for improvement in many areas of operations.

Despite having some of the leading engineering institutions in the world (IITs / NITs) India has lagged far behind China in its manufacturing capabilities.

How do you think this situation can be changed?

The reason for India's poor progress is largely a matter of poor governmental policies. Imagine if India was governed today the way China is governed. While I do not suggest that that would be a good way to go, I have little doubt that such an India would be a powerful manufacturing machine. Or suppose India was governed by a businesslike system as in Singapore. In purchasing parity terms, that is now one of the richest countries in the world. Or look at what Malaysia has been able to do in very few decades, with their clear focus on exports. Korea in 1947 had the same per capita GDP as India, but consider where they have reached today. None of these countries had any advantage over India in education or technical know-how.

These are all different paths for development, and India seems to follow none of them. Unfortunately, the government in India has often been a barrier to progress rather than a help. Fortunately, this situation is being rectified, though perhaps a bit too slowly.

To put it a bit differently, look at what happens when an Indian of practically any social class or education moves from India to almost any other country which is relatively open in its policies. He or she is quickly successful even despite handicaps like language, lack of initial resources, and cultural unfamiliarity. Why is that? It must be the environmental setting and not the person that is the limiting factor or the reason for success.

A second important factor for Indian advancement is capital formation. A third is a lack of capacity in education systems and a lack of access to basic education.

The IITs and IIMs are great institutions, and of immense value to India. But their capacity is limited and the need in India is for vast numbers of adequately trained professionals. Similarly the best academics and researchers in India will bring value to the most sophisticated companies that address world markets with world class goods and services. But then there is also a need for educating managers for the large portion of the economy that is not necessarily globally oriented. At this time, the Indian economy is relatively weakly connected to the rest of the world, and in the future this may remain the case. A good measure to look at here is the ratio of the total trade volume to GDP. In India's case, this ratio is quite low (unlike China).

India has made good progress in space and missile technology but lacks capabilities to manufacture commercial or military airplanes. Do you think India will be able to compete with Boeing or Airbus and make its own airplanes in fifty years?

Over time, the number of large commercial airplane manufacturers world wide has shrunk to just two major players. I doubt that an Indian company will compete with Airbus or Boeing in the near future, and I don't think any should try. What might make more sense is for India to become a supplier of parts and components to those companies. It might also make a lot of sense for Indian companies to build smaller planes (like Embraer in Brazil or Bombardier in Canada) that can be used for regional travel in India, Latin America, Asia, and Africa, or for special applications like crop dusting. Another important direction would be defense aircraft. There too aircraft components, avionics, unmanned vehicles (UAVs), combat helicopters, and missiles could be good directions for India. India is building an indigenous fighter in its Light Combat Aircraft (LCA) program (also called Tejas).

India already exports over $100 million in defense items, including helicopters (Dhruv), missiles and aircraft. The LCA Tejas has logged over 1000 flights but has yet to enter service. The next version will be exported and will compete with a Chinese product which is somewhat cheaper. HAL is also developing a transport airplane as a joint venture with Russia. I am not necessarily thrilled with India becoming an arms exporter, but it is a reality of our world and India has to be an arms buyer as well.

You have been an alumnus of IIT, Mumbai, but neither the IITs nor the IIMs have been successful in producing top quality researchers in India. What can be done to change this?

The most basic issue is that of incentives. Would working hard on research improve the lives for faculty? Usually not. Institutions need to create stronger incentives for research. Available research funds are often limited, and also often shared equally among faculty without relation to performance. The IITs and IIMs have become world famous because of setting the highest standards for their students. They need to do that for their faculty as well.

Apart from incentive systems, the resources available for research must be marshaled. One way to do this might be to direct effort towards applied research that companies are willing to support. This is not an easy road, but it leads to a double win. And this kind of research will also improve education. This would be a better direction for Indian institutions, than using journal publication as a measure. I suggest instead the measure of volume of research and project funding from both private and public sector sources.

How can Indian institutions attract top research talent given the constraints of salary and other benefits?

The short answer is that they cannot. At their inception, the IITs and IIMs were the best option for Indian academics, with the best pay, the best students, and the best facilities. Today, the students are still excellent, but the salaries and benefits are not, often being literally a tenth of what they should be. So often they can only attract people who want to be there for some personal reason. This situation will have to be rectified for the best people to be recruited.

What do you think about the lack of collaboration among Indian institutions? For example there is very little collaboration among the IITs, IIMs, and ISIs..

I don't believe that this is a very significant issue. The degree of collaboration between US schools is not very great either. It is especially low in management schools. A much more important direction of collaboration for Indian academic institutions would be with colleagues in industry.

Cross institution collaboration can be more important in complex engineering projects, where many kinds of expertise have to be brought to bear. The LCA project is a case in point. Another would be a project that requires large scale equipment and many researchers. High energy physics is an example. But in these cases, the central locus of the activity is likely to lie outside the academic institution, in a defense institution, a company or a national or international research laboratory.

Prof. Ajeet Mathur's ongoing research activities

Book on NEPAL

A book titled 'NEPAL' authored by Professor Ajeet N. Mathur was published by Kluwer-Deventer Publishers, Netherlands, as part of the International Encyclopaedia of Laws Series. This book traces the genesis of countervailing power for democratic institutions in Nepal's polity and provides a comprehensive commentary on laws and industrial relations concerning industry, labour and employment in Nepal. Nepal has been in the news after the cessation of internal hostilities as a promising destination for potential foreign direct investment. It shares an open border with India, a large market for a range of consumer goods. The book discusses cases alongside an analysis of the legal framework that enables questions concerning laws and economics to be addressed together.

Research Project: Finland-India Economic Relations

As part of the Finland-India Economic Relations Research Project supported by IIM Ahmedabad and Liikesivistysrahasto, Ajeet N. Mathur of IIMA and Sari S.A. Mattila of Tampere University of Technology co-authored the Keynote Paper "India-Finland Economic and Technology Cooperation: Expanding Frontiers, New Horizons, Transforming Arenas" published on the occasion of the Finland-India Technology Summit November 25-27, 2009, in New Delhi. The Summit brought together over 120 Finnish firms with potential Indian partners for new collaborations across a range of new opportunities in water management solutions, waste management, clean technologies, biotechnology-pharma tie-ups, nanotechnology solutions in energy and environment, biomaterials and infrastructure projects. The Governments of India and Finland signed four bilateral agreements on science and technology collaboration on the occasion. Aalto University and the Turku school of Economics in Finland have expressed interest in collaborating with IIM Ahmedabad to institutionalise this research project. Follow-up events to this will include a Finland-India Business Day in Ahmedabad in September 2010 when a book from the project will be released. Those interested in participating may write to anmathur@iimahd.ernet.in

Documenting Indian Traditions of Experiential Learning

The highlight of the Belgirate International Conference November 5-9, 2009 this year was an invited keynote paper titled "Experiential Learning: The Indian Experience from the Proto-historic period to the Present" co-authored by Ajeet N. Mathur and Gouranga Chattopadhyay. The paper traces the evolution of threads of continuities and also the discontinuities over a long period of time to raise issues relevant for understanding experiential learning and traditions of succession. The authors conclude by discussing impediments to experiential learning with due regard to social, economic, cultural and political factors, and raise some working hypotheses about the challenges of succession that have relevance for persons and groups in organisations. The paper is being published by Karnac, London, in a special volume scheduled to be released in March 2010.

Coal and Energy Security for India: Role of Carbon Dioxide Capture and Storage

Amit Garg and P.R. Shukla
amitgarg@iimahd.ernet.in

Coal is an abundant domestic energy resource in India and is projected to remain so in future under a business-as-usual scenario. Using domestic coal mitigates national energy security risks. However coal use exacerbates global climate change. Under a strict climate change regime, coal use is projected to decline in future. However this would increase imports of energy sources like natural gas (NG) and nuclear and consequent energy security risks for India. The paper shows that carbon dioxide (CO2) capture and storage (CCS) can mitigate CO2 emissions from coal-based large point source (LPS) clusters and therefore would play a key role in mitigating both energy security risks for India and global climate change risks. This paper estimates future CO2 emission projections from LPS in India, identifies the potential CO2 storage types at aggregate level and matches the two into the future using the Asia-Pacific Integrated Model (AIM/Local model) with a Geographical Information System (GIS) interface. The paper argues that clustering LPS that are close to potential storage sites could provide reasonable economic opportunities for CCS in future if storage sites of different types are further explored and found to have adequate capacity. The paper also indicates possible LPS locations to utilize CCS opportunities economically in future, especially since India is projected to add over 220,000 MW of thermal power generation capacity by 2030.

Reference

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Congratulations!

A paper titled "Linking Emotional Dissonance and Organizational Identification to Turnover Intention and Well-being" authored by Prof. Sushanta K. Mishra and Prof. Deepti Bhatnagar has been accepted by the Academy of Management for presentation in the Academy of Management 2009 Annual Conference in Chicago. This paper has been judged by reviewers to be one of the best accepted papers and published in the Best Paper Proceedings of the programme. Congratulations to Prof. Mishra and Prof. Bhatnagar.

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"B" GRADE

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Ghosh, Diptesh; Chakravarti, N. and G. Sierksma, "Sensitivity analysis of the greedy heuristic for binary knapsack problems", *European Journal of Operational Research*, vol. 169, (2005) #2, 340-350.

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