

The logo for the Major Projects Association features the text "Major Projects Association" in a bold, black, sans-serif font. The text is centered and flanked by four blue horizontal bars on each side. The top two bars on the left and right are angled upwards at their ends, while the bottom two bars are angled downwards. The text is positioned between the top two bars on each side and above the bottom two bars on each side.

Major Projects Association

How Can MPA Member Organisations Make Better Use of UK Academic Resources?

Seminar 122 held at The Royal Academy of Engineering,
London, 2nd February 2006

Summary

Key Conclusions

- Social scientists, as well as engineers and scientists within the academic community, have much to offer. Better understanding of human behaviour and of interactions between people would be of significant value to the major projects community.
- We need to research good decision making, the building block of all management. Unless we can specify the process we will not know whether we are doing it well.
- Currently, many visiting professors in the United Kingdom are under-utilised in linking practice with academic enterprise. They should be used for the benefit both of their host university and the world of practice.
- The Major Projects Association (MPA) could help academia by providing more case studies of what works and what does not, as a source of real data to be used in both teaching and research.
- An academic who had researched a previous project or topic should join the top management team on a project. The benefit to the project would be the input from an analytical mind free from the influence of vested interest and internal politics. The benefit to the academic would be direct exposure to the problems of running major projects and how they are handled.
- Student projects should be better selected and planned so that they are more valuable to the organisations which collaborate, and to the students.
- Many academic groups have expertise in modelling. This resource is underused by industry. We should start a dialogue aimed at enlightening industry about the value of the approach and the modellers about new areas in which it could be applied.
- The MPA is multidisciplinary, as are nearly all of the major projects we undertake. Most university departments in science and technology are not multidisciplinary. They should consider making alliances in order to increase the value of their offering to industry, in the same way as industry does in making its offering to clients.

Introduction

Traditional project management in the United Kingdom is facing an increasing worldwide challenge from both old and new competitors. An initiative, funded by the Treasury, to address the question of how universities could better link with industry and the government to boost new business ventures resulted in the Cambridge-MIT Institute (CMI) partnership. Established in 2000, it is modelled on the Massachusetts Institute of Technology (MIT) in the United States and is designed to enhance university/industry engagement, and focus on the needs of the economy by developing new approaches to education, research and practice.

The aims of the seminar, which included workshop sessions, were:

- To explore emerging trends in the conduct and management of major projects
- To review the need for expertise
- To explore new approaches to academic engagement

New trends in the conduct and management of major projects

Major projects always have a technological component, which varies from sector to sector and from project to project, and a 'human' component which is common to all projects. Because technology evolves, each project will usually be different in some way from a previous one, for example new buildings have some new materials, whilst systems for energy management, security or communication are upgraded or updated, if not actually new.

Technology in some sectors of the major projects industry has not advanced very much. For example, motorway design and construction has not developed appreciably in the last fifty years, and in the building industry the development of new materials and construction techniques has been slow. There is an increasing demand for infrastructure projects to be eco-friendly both in terms of the environment and their direct effect on the quality of peoples' lives.

The commissioning of projects could be made easier by new advances in the design process, not just in terms of computer aided design (CAD), but in monitoring design for compliance with the defined objectives. As the constraints on a project grow, so increasingly a product must be designed as part of a complex structure rather than as an isolated piece of construction.

The academic community and practitioners in industry could fruitfully collaborate within the fields of design and technology, to solve current problems and explore new areas for research and innovation.

The human factors relevant to the management of major projects, for example how to assemble and motivate a project team, or how to finish projects on time, are cross-sectoral. Academia could usefully help in identifying and exploiting trends for better project management.

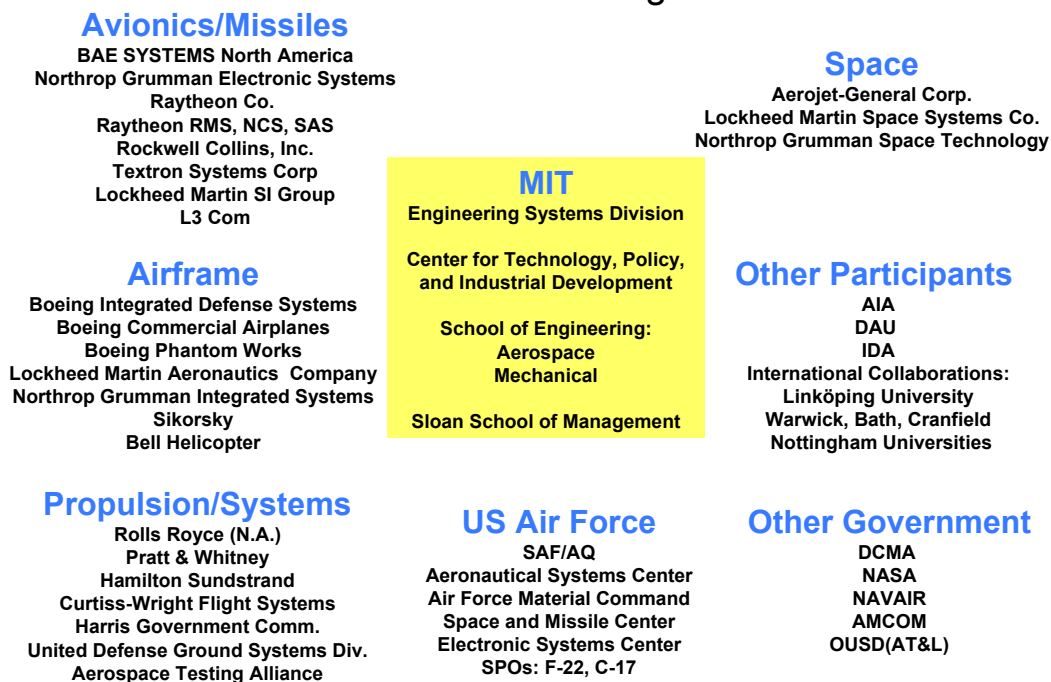
Other areas where academia could provide valuable input were suggested, ranging from the globalisation of major projects to how to apply the lessons learned from one project to the next.

The Cambridge-MIT Institute

The Cambridge-MIT Institute (CMI) amalgamates the wide ranging research options of Cambridge University with the well honed business acumen of the Massachusetts Institute of Technology (MIT).

As can be seen from the example below, MIT has an excellent record in bringing together consortia of industrial organisations willing to put money into projects of common interest:

MIT Lean Aerospace Initiative ... a venue for collaboration on Aerospace challenges



The CMI strategy has three main thrusts:

- Putting together novel education courses leading to Master's degrees in technology policy, bioscience enterprise and sustainable development. This has included research into the educational process itself, in order to understand how and what people learn from different kinds of delivery, whether it is in lectures, laboratory classes or hands on projects
- Developing joint multidisciplinary research projects which take advantage of the different expertise in both universities
- Knowledge exchange with industry by bringing together communities of people from different sectors such as construction, transport and communication

...continued

Projects are typically multidisciplinary and multi-institutional.

Huge range of projects

- Finance
- Silent aircraft
- Systems biology
- Communications research network
- Centre for competitiveness and innovation
- Quantum information theory
- Ageing infrastructures / Smart infrastructures

and many more

Target sectors of the economy

The sectors targeted are energy, healthcare, transport and construction. They focus on strategic issues, encouraging the use of relevant technologies and cross-fertilisation of expertise within a neutral forum. Projects in the transport and construction sectors illustrate the kind of work carried out:

1. Transport

Funding by the Department for Transport (DfT) has resulted in the setting up of the National Transport Data Framework. This puts together data from many varied sources and involves a consortium of experts, including computer scientists and experts on transport from the universities of Cambridge, Edinburgh, Leeds, Imperial College and Southampton.

The overall aim is to give people greater confidence in using public transport, to give operators help in planning systems and the government better information for distributing funds. It involves the efficient handling of massive amounts of very varied data which will give people direct and immediate information about forms of transport, economics, demographics and the environment. Other applications of the data framework include a study of people's exposure to pollution from transport which would, for example, warn asthmatics to stay away from areas of high pollution, but would require rapid handling of data in real time.

2. Construction

Representing some 20% of gross domestic product (GDP), the construction industry has a number of issues which need to be addressed. For example, many of the buildings that have been produced in the past have not been ideal for the people that have to use them. CMI is successfully collaborating with industry representatives to identify and discuss areas for change, and looking at how projects can be better organised and managed, for instance in terms of research and the introduction of new technologies.

Conclusion

The United Kingdom faces increasingly powerful and sophisticated competition from developing countries. High skill activities need to be encouraged, which require high attainment levels from students of mathematics and physics.

CMI gives students the opportunity to engage with real companies tackling real projects. Like the MPA, it also acts as a forum for the exchange of knowledge, and co-ordinates 'common cause' for the investment of resources in substantial major projects.

It is hoped that the links between government, industry and academia will enable the UK to maintain a project management excellence which can be exported to the rest of the world.

Participating organisations

Arup
BAA plc
Balfour Beatty plc
Bechtel Ltd
British Energy
Cambridge-MIT Institute
Centre for Research in the Management
of Projects (UMIST/UCL)
Department for Transport
EDF Energy
Fujitsu Services
Henley Management College
Imperial College London
KBR
KPMG LLP
Lockheed Martin
Major Projects Association
Mott MacDonald Group Ltd
Mouchel Parkman
Office of Government Commerce
PA Consulting Group
Pell Frischmann
Risk Solutions
Rolls-Royce Naval Marine
Rolls-Royce plc
Scott Wilson
Shadbolt & Co LLP
Union Railways Ltd