

Review of the Centre for Mathematical Social Science (CMSS) at the University of Auckland

Summary

In the years since its inception, CMSS has shown itself to be a productive vehicle for inter-faculty research collaboration and the research outputs are of high quality. Going forward, the Centre is at somewhat of a crossroads: it could continue on its current course with minor funding and pure academic outcomes or it could devote effort to increase its external relevance and to attract funded research projects. It is clear that those in the Centre have aspirations towards the latter, but the strategy and outreach aspects are not yet in place to support this. The reviewers are of the opinion that CMSS should continue in existence in some form, and that a stable, annual funding base be negotiated, to be contributed by participating Departments. Continued establishment and funding should however be conditional on preparation of a satisfactory strategic plan, and the achievement of incremental steps towards an expansion of the scope and influence of the Centre.

Status of the Centre

The CMSS is an interdisciplinary Departmental Research Centre hosted by the Department of Mathematics at the University of Auckland. There is active participation in the Centre by the Departments of Mathematics, Computer Science, Philosophy and Economics, so the Centre spans multiple Faculties. The Centre was established in February 2010, and is being reviewed in December 2013 after three years of operation.

The University of Auckland has three tiers of research centres: Departmental, Faculty and University. The CMSS is a Departmental Centre. One issue before the review team is whether this is the appropriate categorisation for this Centre.

The Review Team

The review team consists of Professors Mark Gahegan and Peter Bardsley. The review process is overseen by Professor Eamonn O'Brien, and the review team will report its findings to him.

Peter Bardsley is Professor of Economics at the University of Melbourne and Director of the Centre for Market Design. He has run a number of research centres and networks, including the Economic Theory Centre at the University of Melbourne and the Australian Research Council Economic Design Network. He sits on the Advisory Boards for several Research Centres of Excellence, including the Melbourne Energy Institute and the Centre for Excellence in Biosecurity Risk Analysis hosted by the Department of Botany at the University of Melbourne.

Mark Gahegan is inaugural Director of the Centre for e-Research and Professor in the Department of Computer Science at the University of Auckland. Prior to this, he was associate director of the GeoVISTA Center, at Penn State, USA. He has written over 100 peer-reviewed articles, given over 110 invited talks, and been PI or Co-PI on about 40 funded projects. He serves on the editorial board of 8 international journals. He has played a key role in establishing eScience communities within several academic communities: including geosciences, bioinformatics, fungal plant pathogens, digital

archaeology, and climate change impacts. He was lead author of the National eScience Infrastructure (NeSI) proposal that was funded by the Ministry of Science and Innovation in 2011, to coordinate support for eResearch and high performance computing across New Zealand.

Terms of Reference

The University of Auckland provides Guidelines for the Review of Units, Centres and Institutes. The Guidelines set out recommended Terms of Reference (TOR) for the review of Faculty and University Centres, but make no recommendations with regard to Departmental Centres. We have used these TOR's as a background checklist of issues to be covered, but we do not formally report against them.

Financial position and Financial Management

The Centre has no budget allocation and no need for formal reporting against budget. Funding for Centre activities has relied on ad hoc funding mechanisms, for example Cross Faculty Research Initiative Fund (CFRIF) grants, university initiatives for funding visiting scholars and 'donations' from department heads.

Total amount of annual funding is small (<\$15,000 per year). The piecemeal approach to funding means that the transaction cost of securing funding is high, and there is continual anxiety and uncertainty about funding. These factors have been a distraction that has impeded longer term strategic planning.

If the Centre is to continue then it is desirable that it have a small but secure funding base on which it can plan, and scope to increase this funding base with future growth. It is also desirable, as there is a transition from ad hoc to more stable funding mechanisms, that better mechanisms for formal financial reporting be put in place.

Mission and Governance

At present the Centre Mission is implicit, rather than explicit, and Governance is informal. There is an Annual General Meeting, and Directorship of the Centre rotates amongst the participating Departments (Mathematics, Computer Science, Philosophy and Economics). These arrangements are natural and appropriate for a Centre that emerged from a growing interdisciplinary academic collaboration between disparate disciplines, and the creation of a Centre to facilitate this collaboration.

There is an eminent Advisory Board of international scholars, but only some members of this Board are active in support of the Centre.

The strengths of the Centre, and the potential contribution that it could make to the University, are not apparent under these informal arrangements, even though they have been perfectly satisfactory for the purpose of facilitating scholarly collaboration. Since there is no university-level governance in place, there are also no senior institutional leaders who come into regular contact with the Centre and its activities, and who might provide opportunities for support and growth.

It is apparent that there is in fact a strong interdisciplinary synergy that has drawn these scholars together. The connections between philosophy (particularly logic), computer science, mathematics and economics are fundamental and deep. There are strong intellectual traditions in New Zealand in

some of these fields, and the Centre builds on these traditions. The conjunction of these fields is important in a number of cutting edge research areas, including social choice, complexity theory and the design of voting institutions, the philosophy of belief, knowledge and influence, and the logic of influence, peer pressure and innovation in networks, particularly social networks. These are not just academic issues. They are relevant to a range of important social and policy issues: for example, what can we say about an optimal regulatory framework, if any, for social media such as Facebook? how do we design voting institutions that are robust to manipulation? The work of the Centre is relevant to these and many other similar issues. The conjunction of relevant disciplines that has come together under the CMSS, and the fact that this is a genuine collaboration, not just a marriage of convenience, provides an opportunity for the University to be influential on these policy issues. We are not aware of a similar conjunction of scholarship elsewhere in the world. However, the current policy impact is marginal, since there is little to no engagement outside of the arena of academic publishing.

There is potential for the CMSS to grow in this direction, but this would require a deliberate decision and a strategy to do so. Some important steps would be:

- To invest some time in clarifying the mission and comparative advantage of the Centre. What is the unique conjunction of talents and capabilities that has come together here? At present the focus is purely on academic output in a highly specialised literature. The focus could be broader, without diminishing this core academic objective.
- To develop a strategic plan, with planned incremental growth in scope and engagement as well as in pure scholarship over several years.
- To develop a broader range of scholarly and policy related partners and stake holders.
- To restructure and make more use of the Advisory Board. The Board can be a key tool in gaining influence and access to a broader range of stakeholders, particularly stakeholders in the realm of public policy.

Stakeholders and Management of External Relations

The focus of the Centre has been almost entirely on scholarly collaboration and academic publication, in which it has been successful. It has managed these scholarly stakeholders (academic peers, journal editors and so on) very well. There is scope, however, to substantially expand the range of stakeholders and to manage external relations more deliberately and actively.

Achievements

The Centre is making a solid and growing contribution to scholarship, through publication, through attracting academic visitors, and through its annual conference. This conference in particular is of high quality and is regarded as an important meeting by international scholars. Considering their resourcing, it would be unreasonable to expect more.

Problems that need to be fixed

The main issues facing the Centre are:

- the need for a secure funding base
- the need to clarify its strategic objectives with regard to future growth and scope
- the need to engage with potential stakeholders and funders

Strategic Issues

These are dealt with above

Recommendations

At the moment, the Centre's outcomes are in keeping with its membership and resourcing. An important question going forward is whether the Centre can rise to the next level in terms of reputation, funding and outcomes. In order for this to happen there will need to be considerably more emphasis placed on creating and maintaining connections that will lead to funding opportunities from outside of the university.

In this sense, the Centre is at a tipping point: it could continue on its current path of modest funding and expectations, or it could try to expand its funding base and membership by looking beyond the university. This would require redirection of research time to the task of engaging with the policy sector.

It is recommended that:

1. The CMSS continue in existence in some form.
2. Members of CMSS, along with their Advisory Board, urgently decide on a path forward and commit to it. This might be as an informal research group, or as a Departmental or Faculty Centre. If a path of growth is chosen, then a Faculty Centre might be most appropriate in the longer term, given the interdisciplinary nature of the Centre. However the spread of disciplines across Faculties might make this awkward.
3. A stable, annual funding base be negotiated, to be contributed by participating Departments. The amount required will obviously vary on the outcome of #2 above. As a bare minimum, to continue to offer their excellent summer school activities, an operating budget of \$15k-20k needs to be secured annually, and ideally in advance. Given there are several departments involved, this amount does not seem onerous.
4. Continued establishment and funding should be conditional on preparation of a satisfactory strategic plan, and the achievement of incremental steps towards an expansion of the scope and influence of the Centre. This would be evidenced by external funding and relationships, to contribute towards future growth.
5. A strategic plan is urgently needed, to specifically address the increase the range of scholarly and policy related partners and stake holders, and to restructure the Advisory Board. We would suggest a three year horizon.

6. The success and viability of the Centre be assessed not only in financial terms but also through scholarly impact (using metrics appropriate to the relevant disciplines) and through its contribution to public policy and public debate on policy issues on which it has expertise.