

Forum

The right vision for construction R&D? Responding to the Fairclough Review

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Background

When BRE was privatized in March 1997, it was offered guaranteed funding on an annually decreasing scale for 5 years under its Framework Agreement with the Department of Environment, Transport and the Regions (DETR). During this transitional time, it was expected increasingly to compete for government research funds and to raise the fraction of its total income that it received from industry. By 2001, the 5 years was coming to an end and Sir John Fairclough was commissioned by Nick Raynsford (the Minister for Construction at that time) 'to provide an independent view of what future role government should play in supporting construction research'.

Following the general election in June 2001, construction sponsorship was transferred from the former DETR to the Department of Trade and Industry (DTI), while the newly created Department of Transport, Local Government and the Regions (DTLR) assumed responsibility for building regulations. Fairclough's Review was overseen by both Departments and the remit was broadened to consider how the new arrangements could best serve the needs of the various construction stakeholders – clients (including government), the industry, the research base and the wider community.

Terms of reference and consultation

In its formal terms of reference, the Review was to do the following:

- To assess what research competencies and facilities government should help maintain in order: to provide scientific underpinning for the Building Regulations; to be able to respond to urgent concerns over health and safety in buildings; and to support government policy to ensure a more competitive and sustainable UK construction industry.
- Review the processes by which research priorities are established and research commissioned.
- Review research competencies and facilities currently available.
- Make recommendations about the level and distribution of continuing support that the DTI/DTLR should provide to support key competencies nationally.

Six bodies submitted written representations, and Fairclough consulted widely with the following:

- Research supply side (industrial research organizations, academics).

- Research demand side or end-user side (clients, consultants, contractors).
- Government bodies responsible for public funding of construction research.
- Bodies set up by government to manage change in the industry.

Main lines of argument

Fairclough's *Rethinking Construction Research and Innovation: A Review of Government Policies and Practices* (2002) rehearses a number of reasons why construction R&D should be supported:

- Construction is an important sector in the national economy and in respect of quality of life.
- It needs to deliver better value for money while also becoming more profitable.
- Innovation is essential to competitiveness and effectiveness.
- R&D is a driver of innovation and is as important to this sector as to any other.
- Innovation occurs in construction projects, but is not adequately captured and fed forward.

- Industry does not give R&D the same priority or level of funding as occurs in other sectors.
- Public investment in research is inadequate compared with the size and importance of the sector, and current public expenditure on R&D is the minimum the sector deserves.

The Review recommends that present levels of government funding for construction should be safeguarded.

Four main relationships that government has to construction are identified: as regulator, policy-maker, client and sponsor. The Review acknowledges that each of the four implies different styles of support for R&D, and that each should be considered separately. These are summarized in Table 1.

Industry-led strategic framework for R&D

To improve the industry through construction sponsorship, the Review recommends the development of a strategic vision for the future, and a strategic framework for R&D to support the vision. Construction needs 'to develop its vision, get widespread buy-in, and communicate it to all stakeholders. The research agenda needs to support this vision and government should facilitate it as part of its sponsorship role' (page 28). A three-stage process is recommended:

- 'Mission statement': the development of a mission statement about construc-

tion's contribution to the quality of life agenda, *driven through the industry from the top down* (my italics).

- 'Industry strategy': the preparation of a strategic vision for the industry, covering planning and investment in education and skills, in capital infrastructure, and in R&D.
- 'R&D priorities': a strategic framework for R&D to include a prioritized agenda to help the industry achieve its strategic aims.

The Review recommends that the Strategic Forum should take the pivotal role in setting the industry's strategic vision, supported by a dedicated R&D organization in the form of a new CRISP (Construction Research and Innovation Strategy Panel). This is noted to have the added advantage of introducing research and innovation issues into the Strategic Forum. CRISP itself has responded positively to the Review. In its letter to the Minister of State for Construction (available at: www.crisp-uk.org.uk), it acknowledges that a restructured version of CRISP needs to have a close working relationship with the Strategic Forum and that this will give it a greater, and much needed, sense of ownership by the whole industry.

The Review contains many recommendations about R&D in support of sponsorship, including the need for the following:

- A road map for the research needed to tackle the most important issues.

- Real championing of funded research within industry and a willingness to engage; but no funding if these are lacking.
- More emphasis on dissemination of outputs and sharing of knowledge – using intermediaries if necessary.
- Learning from other sectors and from abroad.

In terms of procurement, the Review notes the importance of critical mass in research and recommends funding programmes of work rather than individual projects. Although the need to retain the flexibility to support one-off projects is cited, it also recommends that awards are competition-based, with industry funding at least half the cost of research that is in support of its own competitiveness agenda.

Precedents for the study

Fairclough's Review and in particular its relationship – including a partly shared title – with Sir John Egan's *Rethinking Construction: The Report of the Construction Task Force* (1998) have a clear precedent. When Sir Michael Latham was asked to study the industry and wrote *Constructing the Team: The Final Report of the Government/ Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry* (1994) about the procurement reforms that were needed to make the industry more competitive, the Department of the Environment commis-

Table 1 Summary of government roles, funding responsibilities and mechanisms for industry support

Government role	Funding	Mechanism
Regulatory (health and safety, building regulations)	Fully funded by government	Sought competitively from industrial research organizations; longer-term programmes of work to create centres of excellence
Policy-maker (energy efficiency, climate change)	Fully funded by government	As above
Major client (better value for money, fitness for purpose)	Encourage government clients to engage in research collaboration beyond their immediate needs	Partnerships between DTI and OGC, with public-sector clients as collaborators and/or co-funders
Construction sponsorship (improve competitiveness, productivity and efficiency)	Government pump-priming, but then needs to be owned and managed by the industry	Facilitate long-term vision for the industry – and a strategic framework for R&D

sioned a study of *The Funding and Provision of Research and Development in the UK Construction Sector 1990–1994* (Construction Forecasting and Research Ltd, 1996). This study was undertaken on behalf of CRISP. In the Foreword to the report, the Chairman of CRISP wrote:

The current climate of change within the construction industry engendered by the Latham review 'Constructing the Team' offers a unique window of opportunity. Research and innovation have key roles in promoting an improvement in performance of the construction sector to the benefit of both the industry and its clients.

The study followed the methodology of an earlier review of construction R&D by IPRA (a private-sector research consultancy), and a detailed picture of this period of building research both nationally and internationally was published in a special issue of *Building Research and Information* entitled 'The Future of National Building Research Organizations' (1997, volume 25(5)). CRISP itself was rejuvenated, and it developed and promoted the Whole Industry Research Strategy (WIRS).

Valuable though these initiatives were recognized as being, Lansley (1997) levelled two criticisms. First, that

WIRS . . . may be too dominated by the views of industry. Users' needs, the identification of new areas for research, society's long-term need for improved quality of life . . . may be sacrificed to a desire for control, the rationalization of research programmes and short-term industry competitiveness.

Second, that

vibrant and relevant research is likely to be generated in an environment which supports a wide variety of research organisations and different types of research entrepreneur. Universities may have a special role, to develop the unfashionable and uncommercial fields. . . .

The trend towards rationalization and, by implication at least, lack of variety are both to be found in the Fairclough Review. Conversely, the place of university research does begin to be more clearly located.

Breadth of the emerging research agenda

There are several welcome indications in the Review to imply a broad agenda for construction research. The Department of Culture, Media and Sport's *Better Public Buildings: A Proud Legacy for the Future* (DCMS, 2000) is cited, including reference to Prime Minister Tony Blair's Foreword stressing the need for the UK to raise its game in the provision of public buildings and infrastructure. As the Review states:

Positive Government engagement aiming for improvements in the quality of design and construction, in the value and sheer enjoyment of the built environment and in a more sustainable future, serves everyone's interests. (page 18)

And:

A narrow definition of construction research cannot properly serve the future needs of the sector and its stakeholders, and for this reason the Review as a whole has taken a much wider view of construction's contribution to the UK economy and the quality of life. (page 9)

These are fine words, and it is to be hoped they will be implemented in the development of the strategic framework recommended by the Review. However, both the list of those consulted for the Review, and indeed the tenor of the Review itself, imply far more emphasis on the competitiveness agenda and the needs of industry, with much less weight given to quality-of-life issues such as user needs, civic pride, and occupant health and well-being. The issue of breadth of vision will be a vital issue for those responsible for the strategic framework to deal with if Lansley's criticisms are to be addressed adequately. There are clear implications here for the composition of the new CRISP and its remit. Not least of these is the need for a new definition of the relationship between, on the one hand, construction as a means of production and, on the other, the built environment as a product (its occupation, use, perception and management by society). If industry is expected to part-fund research in support of its own competitiveness agenda, who will fund or part-fund research in support of quality of life issues? The Review deftly avoids having to face this.

Construction research base

Perhaps not surprisingly, given its origins within the DTI whose support goes largely to IROs (independent research organizations), the Review gives relatively little attention to the place of universities within the research base, although it does make three interesting proposals in relation to them. First, it suggests the university sector and the construction industry are poorly linked and recommends that research procurement should encourage better coupling between universities, IROs, intermediaries and industry. Second, it identifies the probability that in future more of the research that government funds will find a natural home in university departments, in collaboration with industry, because of its longer-term strategic nature. Third, it recommends that the IROs ('the traditional construction research base') enhance their role as intermediaries between academic research and industry, targeting industry practitioners with information and guidance on international research and technological developments.

The Review acknowledges that links between industry and academia have improved as a result of EPSRC's (UK Engineering and Physical Sciences Research Council) Innovative Manufacturing Initiative (IMI). IMI itself arose from the report written nearly 10 years ago under Stewart Miller (1994) that called for coincidence of purpose between university research groups, industry, research councils and government departments. As a consequence of the fortunate inclusion of construction within IMI, the academic research community in construction has had almost a decade of experience working to an industry-led agenda under research managers seconded from industry. EPSRC has its own Strategic Framework for Innovative Construction (written by the author, but regrettably unpublished) that draws on a wide range of industry sources, particularly CRISP Task Groups and Foresight. Following EPSRC's decision to focus its funding for construction in three Innovative Manufacturing Research Centres, from 2001, the consolidation of the university research base recommended by Fairclough is already in hand.

What the construction sector has lacked in the past, but the Review begins to address, is delineation of the complementary roles and functions of industrial research organizations and universities. The two types of

organizations are quite different, although their areas of interest increasingly overlap. Traditionally, academics have worked on fundamental and strategic problems, with longer time scales to application in practice. IROs were more responsive to immediate industrial needs and mostly undertook applied research. Several IROs were formed to investigate specific construction materials (timber, steel) or service areas (building services) and had a strong technological focus. By contrast, following the Miller Report's recommendations, universities enlarged their remit to study business processes, such as knowledge management, teamwork, supply chains, risk management and human resource management. Indeed, core expertise in these areas already existed in academic social sciences and business departments. This expertise has been adapted and used for construction and complements technology-based innovation.

However, a simple division between the two parties no longer applies. The Miller Report called for universities to engage directly with industry on research that responded to 'industrial pull', with the result that universities now are engaged on short-, medium- and long-term research into both technology and business process. Similarly, with the change in emphasis in construction sponsorship from 'Partners in Technology' to 'Partners in Innovation' in the late 1990s, the IROs have moved from technology research towards business process issues (though not often to long-term or fundamental research).

The result has been a blurring of the boundaries between the types of research undertaken in universities and that undertaken by IROs. One implication is to put universities in competition with IROs for funding. While Fairclough appears to envisage IROs and universities working together on joint programmes of research, and IROs disseminating the new knowledge generated by universities, both options may be difficult if they are also in competition for subject-territory and funding. The blurring of boundaries and competition may be inevitable, and it may even be healthy. Whether either side welcomes it, however, is another question. IROs appear uncomfortable competing with academia, while universities also face a dilemma. Academics are encouraged by funding bodies to carry out applied research and to embed their findings

directly into industry through close liaison and networking. However, academics simultaneously are situated within a funding system (based on the Research Assessment Exercise) which rewards the production of 'new knowledge' and its publication in the peer-refereed journals, with little or no credit awarded for industry-related liaison and dissemination.

The Review says:

The key point to stress is that much more collaboration between industry and academia is required if the industry is to properly benefit from university ideas and expertise (page 11).

Coupled with the recommendation that IROs act as intermediaries between universities and industry, the Review in effect calls for closer engagement between all three parties. This is a worthy ideal, although what it means in practice, how it might be implemented and what barriers will need to be overcome remain unstated.

In this same section of recommendations on the construction research base, the Review says:

Government and industry will procure long term strategic thinking and work focused on key parts of the competitiveness agenda (page 11).

Once again, this seems like a worthy ideal, but its implementation has yet to be tested. It is in the nature of long-term research to be speculative and high-risk. Is it reasonable to expect industry to fund or part-fund this type of research?

Destructive fragmentation or healthy diversity?

The construction sector is made up of a large number of small companies, a factor which Egan (1998) found 'one of the most striking things about the industry'. Yet, the Review's attitude towards small and medium enterprises is ambiguous. It suggests that small companies are too preoccupied with survival to engage with a strategic research agenda, instead requiring targeted help to improve such as the distillation of new practice through programmes like the Construction Best Practice Programme. However, it also notes that 'innovation gained through active

collaboration in R&D projects has a better chance of becoming embedded in company practice than innovation invented "over there"' and therefore that more construction companies should be encouraged to engage positively in collaborative research. The Review acknowledges that while critical mass and centres of expertise are to be encouraged, future R&D procurement arrangements should continue to allow smaller organizations to engage in construction research – allowing adventitious and innovative work.

While this acknowledgement of the value of small-scale innovative projects is welcome, the Review's overall emphasis is towards the major players. It notes that only the larger construction firms have the capacity to absorb innovation and new research knowledge (using the number of technically qualified staff as the measure of this). It is critical of there being a large number of 'small projects carried out in a fragmented research base' and of the fragmented university research base. It wants bigger programmes of work let on long time scales. It calls for the coming together on one site of the five construction research organizations ('Co-Construct'). In its prescriptions, it calls for a shared vision for the whole sector – while acknowledging that few small organizations have the resources to engage with strategic issues; so that in practice the shared vision will be developed by the dominant players in the industry. The shared vision is then to be driven down through the industry from the top.

Administratively, the big-science, centralized model of R&D, responding to a unified homogeneous industry-wide agenda, carried out in large chunks by a few large co-located institutions, on long programmes of work, has a certain simplicity and neatness. It begins to be reminiscent of the WIRS. It certainly makes R&D easier to manage. It also simplifies dissemination, in so far as the industry need approach a few easily identified sources to locate new research findings. However, is it the right model for the construction industry?

Is construction really an industry at all or just an agglomeration of participants who are constantly forming and reforming short-term project teams in a variety of contractual relationships, and who come from a wide variety of different disciplines each with their

own distinctive needs for new knowledge and priorities for research? Can this 'industry' be expected to develop a shared vision that is inclusive of all the participants – especially if the vast majority are presumed to be too preoccupied to participate? If it cannot, whose views will dominate – and be 'driven through the industry from the top down' – and whose will be left out?

Fragmentation is a carefully chosen descriptor, but one person's fragmentation is another's diversity. An Appendix to the Review prepared by the Science and Technology Policy Research Unit of the University of Sussex, Falmer, contains an account of the sources of construction innovation, the place of R&D in construction, and the emerging patterns of construction research. It notes:

The emerging model of construction research in the UK is one of a distributed network of providers in the public, independent and private sectors. These providers may be in competition or they may collaborate together – sometimes both at the same time. . . . The new pattern is one of public-private partnerships, loose networks, interdisciplinarity and increasing internationalisation.

Is this not an alternative and more realistic starting point for considering R&D in the industry? Such a view would accept diversity and variety – of both vision and delivery of research – as healthy and desirable. It would recognize that good ideas – which are a prerequisite of research – are not the sole preserve of large organizations, and that actual innovation (as well as the desire for innovation) can occur in small organizations just as readily it can in large ones. It would recognize that the research needs of small companies are different from those of large ones and that, given small organizations are in the majority, their views and research needs should not only be included, but also seen to be included. It would give a wider range of construction organizations the opportunity to participate in research – thereby raising the likelihood of the outcomes being effectively embedded in practice. It would accept that dispersed virtual teams can be just as effective as co-located ones. And it would acknowledge that short sharply focused projects (such as the condensed studies commissioned by CRISP, or the DTI's Fast Track projects) can, on occasion, be as beneficial as more prolonged ones.

Concluding remarks

There is much to commend in the Fairclough Review. It is a valuable compilation and distillation of views from across a complex industrial sector. To bring it together in this form is a triumph of clarity and brevity. There is no doubt that the Review is a worthwhile contribution to the industry's future well-being. While it does not go far enough in beginning to define priorities, it does suggest some areas (such as sustainability) which need to figure strongly in future R&D. Its prescription for the industry to adopt a three phase approach – 'mission statement', 'strategic vision' and 'R&D priorities' – has much to commend it. Strengthening CRISP (which has already demonstrated its ability to mobilize industry input and define research needs) and linking it to the Strategic Forum would benefit both parties. CRISP's credibility and representativeness could be enhanced, while R&D awareness would be raised within the Strategic Forum. Better links between academia and the industry are to be welcomed, as is the recommendation that IROs act as intermediaries to promote university research to industry practitioners.

There are, however, several areas where the success of the Review will depend on its implementation and where, arguably, there are alternative interpretations but a lack of recommendation about which should prevail. Two of these areas are especially important.

First, in terms of the definition of construction research, the Review recommends it should be broad: 'A narrow definition of construction research cannot properly serve the future needs of the sector and its stakeholders . . .' (page 9). Compared with the task of reconciling the views of a selection of leading construction industry players to produce an industry strategy focused on short-term industry competitiveness, a broad definition is likely to prove complex. Those responsible for interpretation will need to recognize that the stakeholders of construction go far beyond the major players within the industry itself or its major clients. Engagement with a wide stakeholder community is needed, potentially covering the whole of the built environment. Varied, and perhaps even contradictory, views may be expected, and negotiating a shared vision for the industry may be difficult, perhaps even impossible. Yet, the extent to which it is

genuinely shared will depend on the extent to which it has been negotiated. And, if it is not shared, how feasible will it be to drive it through the industry from the top down?

Second, and related to the first area, is the issue of scale. There appears to be a presumption in the Review towards large organizations and their research needs, on major programmes of work over long time scales, and on consolidation of IROs under the guise of overcoming 'fragmentation'. However, good ideas and innovations are not limited to large organizations, nor is research excellence their sole preserve. It is to be hoped that the Review's welcome openness translates into a more open acceptance of healthy diversity and that, in addition to substantial projects defined by the big players and undertaken by the large IROs in major programmes of work, there will be continuing opportunities for research based around loose networks, virtual teams and project-based coalitions.

If the Review has any single weakness, it is a lack of inclusiveness with the risk of creating a monoculture of research supply and demand. Arguably, it might have benefited from the following:

- The participation of a much broader range of stakeholders in the built environment
- Positive inclusion of small and medium enterprises rather than their relegation to the margins
- Acknowledgement of healthy diversity within the research supply side and recognition that collaboration between industry and research providers occurs in rich and complex ways

The real test of the Fairclough Review will be in its implementation. IROs, universities, the industry and government itself all need to change their perceptions of, and working relationships with, each other if the full value of this Review is to be obtained in practice. The key parties charged with implementation – new CRISP and the Strategic Forum – have been set a substantial challenge. If in practice they can construct a shared vision that embraces the needs and priorities of stakeholders across the whole sector, together

with an associated strategic framework for construction R&D that recognizes the value of diversity, it would be the best possible outcome of the Review. Rather less desirable would be for a small number of influential major players drawn from the industry and IROs to set their own agenda and to drive it through the industry from the top down – under the justification that it was what Sir John Fairclough had recommended. Either possibility exists. In practice, an outcome part way between the two extremes seems most likely.

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