

The Research Practice Needs

Article for Scroope 16, 2004 by Richard Saxon CBE
director, Building Design Partnership
chairman, Be, Collaborating for the Built Environment
vice President, RIBA

This article proposes an agenda for architectural research aimed at supporting and transforming practice and the industry. The construction industry is in rapid evolution but with an inadequate vision of its role. Architectural practice is seen as the source of vision at the project level but it has inadequate research resources to be proactive and effective at leading change both at project and industry levels. There are however no rivals for this role and there exists therefore an opportunity for practice and academic research to work together to good effect. A broad programme addressing ways to achieve stakeholder satisfaction could give leadership to the profession and make academic research exciting and relevant. The definition of architectural research would be tested in the process.

Architecture has an ambivalent relationship to the construction industry. Some architects see contractors as akin to the artisans who execute large-scale sculptures from the artist's maquette: skilled craftsmen but not in any sense co-authors. The idea that architects are even part of the construction industry could be disputed. At the other end of the spectrum are those who see architects as the software writers of the built environment. That is where I start; I don't think the normal definition of the construction industry helps either itself or society. I prefer to restate it as the built environment sector. Built environment provides the cradle and context within which society lives. 77% of our national fixed assets and over 20% of our annual GDP are in built facilities, their development, design, construction and management. Our quality of life and economic performance are enabled or degraded by the built environment. It is our job to envision and design a better built world.

The late Sir John Fairclough, in his 2002 report on research in the construction industry, attacks its lack of a vision for itself or a sense of its role. Relevant research goals can only emerge, he believed, from clarity of vision and values. "Construction", he said, "should be seen as central to a better quality of life for everyone and concerned with a sustainable future. The research agenda needs to support this vision."¹

Architects think a lot about quality of life and sustainability, but usually from a detached standpoint, disengaged from construction and from customers seeking the use of facilities. We are like a brain in a jar, scarcely relevant to the vast but largely unthinking leviathan which makes and runs our environment.

Some practices are engaged deeply with developers, contractors and facility managers in delivering value. But they have to do so in the breakneck, unreflective setting of live projects. Teams travel to research good examples. They brainstorm new solutions, they develop better technologies and struggle with lifetime costing. But this in-project research is shot from the hip, barely recorded and inaccessible to others. In use evaluation is rare. Neither practices nor construction companies have adequate models of themselves as continuing businesses outside projects. Projects produce the resources and consume most of them. Off-line activity is hard to justify when profits are so thin and no rivals do better. Clients don't have any core interest in research either; only a handful are professional about their real-estate or social responsibility.

So the field is wide open. The creation and management of useful knowledge about the product and the process of getting it would release huge value, in both quantitative and qualitative terms. Value here is defined as benefit exceeding cost (or 'sacrifice' as some current work at Loughborough suggests)². But is it architecture? In my view, yes. We have let many other skills take slices of the task from us but I see all that as delegation, not loss of responsibility. Architecture must take the central role of defining what stakeholders need, proposing and negotiating solutions and steering execution so that the delivered and operated facility doesn't lose the plot. This is done today to a certain level by practitioners using experience, judgement, and assertiveness, largely unarmed with evidence-based knowledge of what does and does not work.

The Excellence Model³ published by the European and British Foundations for Quality Management is a good way to structure any analysis of desired results and the enablers which could achieve them. According to this model, four major stakeholder groups of the built environment desire the following results.

- Customers obtaining facilities that support their own value proposition (jargon explained below);
- Society obtaining better quality of life on a sustainable basis;
- People involved in providing the built environment (including architects) getting satisfaction and respect;
- Businesses involved in the built environment (including architects' practices) getting growth and profit.

These desired results could be achieved by work in five areas or "enablers".

- Leadership providing suitable vision and values;
- Market strategies which address customer and society needs;
- Resource policies which mobilise technology and supply team relationships;

- People policies which attract, develop and retain talent;
- Processes which are lean and address the whole life cycle.

This is a research agenda as long as all universities could wish to see. Many other disciplines can contribute considerably to it, but architecture not only needs to do a great deal of this work itself but coordinate all the rest. We are the vision and values discipline, the leaders that the others need to enable their contributions to fit.

This is all practical stuff. It is about the instrumental function of buildings and the technical and human business of creating and running them. It's also about making architectural practice more valued by customers and society because it can deliver more value in their terms.

According to KPMG, architectural practices compete with each other for customers by offering creativity, special knowledge, service and price. In the management consultancy view, practices tend to major on one aspect, with a second strength. Creativity, and its evil twin fashionability, dominate the media and the discourse of students but frighten many customers. Special knowledge of building types and technologies is what motivates the majority of customers. Service quality always pleases, but is the core offering of the delivery specialist. Price leadership wins with low-aspiring customers.

Improving practice knowledge of how buildings work would be research's greatest contribution to practice competitiveness. Buildings 'work' at several levels as identified by the CIC's Design Quality Indicator (DQI). They function to house the customer's activities, adapting over time; they operate as machines providing shelter, controlled climate and needing maintenance; they impact the senses, the natural environment and the communities in which they sit. In addition to the DQI functions, they also work as assets, paying into your pension funds as a return on investment over time.

The 1998 essay by Evans, Haryott, Haste and Jones for the Royal Academy of Engineering, "the Long Term Cost of Owning and Using Buildings"⁴, has become famous for its phrase "1:5:200". This paper argued that initial capital cost (1) should be seen in proportion to 20-year operating costs (5) and more importantly, to the staffing cost of the generic office building they considered (200). 1:5:200 quickly got into circulation as one of the yardsticks of the government push for 'Best Value', the proposition with the lowest lifetime cost rather than merely the lowest first cost.

This is all very well as a start, but can be and must be greatly extended by research. I add numbers at the front and back of the ratio to make 0.1;1;5:200:250+. The first number is the design and management cost of creating the facility. The 250+ is the value created by the

staff in the facility, a number which will at least be a significant amount above their salaries and in many cases 10 times higher. The occupier has its own “Value Proposition”, a Harvard Business School term for their model of how a business makes its living. Businesses use a facility to help deliver that value proposition. So the leverage between design and management input and customer value output over 20 years is upwards of 2500 to 1. What we don’t know is what those ratios really are for the key building types. We need them in Net Present Value terms too, in order for customers to understand them. We also need to include land and finance costs alongside the construction costs.

Arguably nobody builds a project with a negative value so all buildings are ‘free’ in that their paybacks exceed their costs in some justifiable way (certain parliamentary buildings notwithstanding). We have increasing evidence that, for example, new healthcare buildings reduce patient stay lengths and drug need, saving operating costs exceeding the annual charge made for the space. Some new office buildings are said to cause productivity leaps and absenteeism reductions which exceed their rents. On the less optimistic side, we have the PROBE⁵ studies which suggest that internal environment quality can add to or reduce occupier performance by similar figures to the rent per workspace. We know that well-designed retail facilities create asset values many times their cost. What we don’t have are recognised bodies of knowledge based on in-use evaluation of the effects of design and management features and their robustness in use.

What practices also don’t have is ways of managing their own knowledge. The constant stream of experience and informal feedback sticks to the memories of some members of the team, but does not become accessible to all. It also leaves with the individuals who float between firms. Academic researchers working inside practices could observe, record, organise and disseminate learning which takes place to the advantage of all. BDP have benefited from an Open University Business School project which has observed a team of designers and contractors, enabling them to see their workstyle much more clearly and to alter its less-effective characteristics.

Society’s needs provide a dramatic research agenda to support practitioners. The lack of coherence in the sustainable communities policy comes from the absence of up-to-date options for lifestyle, urban design, densities, use mixtures, transport potentials and climate change response. Joined-up thinking at government and consultancy level needs joined-up research programmes.

Enabling the built environment to achieve carbon-neutral, waste-free status before the mid-century must be one of the biggest peacetime challenges we have ever faced. Providing the new technologies has to go with envisioning the lifestyles to go with them so that the public

wants to adopt them both. This should hold true not just for the developed world but also for the developing world.

Meeting the needs of people and supplier businesses in the built environment may seem less like 'architectural' research and development (R&D), but it will have huge impacts on the way architecture is practised and what it therefore can do. Developments currently flow without obvious input of architectural vision and values, as we have seen in the rocky progress of procurement paths like the private finance initiative (PFI). How much better it would have been for architectural researchers to have been able to offer models for public procurement which satisfied risk transfer and accountability needs ten years ago rather than the present reactive tinkering after billions have been committed on a flawed basis.

The rapid development of computing in design and construction is my final example. Research into Building Information Modelling (BIM), formerly object modelling, has been happening without much help from the architectural community. Government money in hotspots like Singapore and Finland have pushed forward the potential of 3D design with built-in intelligence, steered by enthusiasts in the International Alliance for Interoperability (IAI, candidate for worst name ever).

Practitioners are contributing, but in the UK it is only now that the 'Avanti' project by the IAI and my development group Be (Collaborating for the Built Environment) is defining projects for academic research to realise the full potential of this and related technology. Quite soon the BIM will allow architects to re-colonise territory conceded to others, to hold the virtual model as keeper of intentions and quality and to move to delivery and lifecycle operation without the present layers of intermediaries and documentation needed. It could also allow others with managerial rather than design skills to marginalise the less assertive architect, creating good-enough buildings from standards and components sourced from across the globe.

Again, the vision and the values that the architectural profession should be holding for the whole built environment should mean that the profession rises to this and the other challenges. Architecture needs more skilled practitioners, but they in turn need evidence-based case material to advocate good design to the managerialists for when subjective architectural value is not enough. The American Institute is, for example, sponsoring work on neurological response to stimuli, to provide rational arguments for design. Architects need new design tools to work for holistic design, bringing speed, control and economy as they also bring vision and values. Architecture is in part a knowledge-based subject. That knowledge base has been only semi-formal, divided between distracted practices and remote academics. A coming together is long overdue.

¹ Rethinking Construction Innovation and Research, The Fairclough Report, pg 28, part of para 2.11, DTI 2002.

² Thomson D S, Austin S A, Devine-Wright H and Mills G R, 'Managing value and quality in design', Building Research and Information, Vol 31, No 5, 2003, pp 334-345.

³ Excellence Model explained in www.london-excellence.org/uk/html/excellence_model.html.

⁴ Available now in Sebastian Macmillan's book "Designing Better Buildings, Spon Press 2004.

⁵ Post Occupancy Review of Building Engineering, Building Services Journal, July 1995.