Home Improvements: Housing Research in Practice

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Foreword

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As demand for housing is increasing, tensions between profitability and demand in house building highlight the difficulties in providing good quality, sustainable homes on a large scale. Architect's skills are critical to delivering solutions to the diverse challenges that this presents, and our work within the project team puts us in a unique position to manifest change.

Issues of design and delivery in housing are interlinked. Understanding these issues and the relationship between them is key to improving housing. However, much of what is known about housing is locked in practice. For some time there has been a growing recognition in our profession that practice needs to be better integrated with research. Having an evidence base for our services would not only reinforce the value of our work, but also help us improve at a much faster pace.

We need further research into what makes good housing and indeed what makes good architecture in general, to facilitate the wellbeing of those who use our buildings and to advance the impact of our profession. This report sets out the current state of research in our profession and provides case studies of practices that are undertaking research in a systematic way. It is our hope that these examples will act as an inspiration to other practices to develop the necessary research skills to articulate the value of their work, and to prove the benefits of architecture to an increasingly evidence driven audience.

Taking a lead from the RIBA Plan of Work 2013 – where research and development is now embedded – this document has been developed to promote successful research techniques. I hope that architects will benefit from these documents by further developing their research methods into commercially exploitable and intellectually satisfying skills.

Stephen R Hodder MBE
RIBA President

Executive Summary

Knowledge in Housing

Practitioners are acutely aware of the issues in housing that need to be addressed. In fact, as part of a project team, architectural housing practices have a prime view of both the design and delivery of housing. From this position, it is clear that many practices develop a strong evidence-base for design and, although this is often not recognised as 'research in practice', it certainly provides a substantial knowledge resource.

Recognised Benefits

Practices that do research and acknowledge it as such receive significant recognition for their expertise from clients and developers. Many capitalise on this by publishing their findings developed through specific research projects or through the accumulation of new knowledge through design.

Opportunities and Challenges

Whilst practitioners have reservoirs of specialist knowledge built on experience, they do not always have the time or capital to accommodate a programme of research work, or more specifically to document the findings and new insights from their research. Furthermore, existing knowledge is difficult to navigate as some findings are kept from the public domain as a result of their commercial value to practice.

Beyond teaching, few practitioners engage with universities for the purposes of research, leaving academic resources and knowledge largely untapped by practitioners. Fuelling this separation is a lack of shared language and a shared difficulty with conveying findings in a simple, yet meaningful, way.

Recommendations

Research is key to addressing prevailing issues in housing, and more generally improving the provision of innovative and quality housing that meets contemporary lifestyles and requirements. This leads to the need for *further research and mechanisms to facilitate research.*

Recommendation 1: further research

There are many diverse areas of housing that require immediate research. We identify two broad areas that require significant research:

a) Long-term Building Performance Evaluations (BPE) that will help to develop a body of knowledge concerning how buildings perform socially, economically and environmentally. This would provide architects with a strong evidence base of successful outcomes.

b) A better understanding of housing delivery mechanisms, including procurement, will provide pathways to enabling greater innovation in housing.

Recommendation 2: mechanisms to facilitate research

We identify the following approaches to facilitate practice-based research:

a) Develop an approach to documenting expertise and knowledge which will alleviate concerns that wider dissemination of commercially beneficial knowledge may weaken a practice's position in a competitive market.

b) Improve networks between practice and academia by providing a clear synopsis of active research areas in schools of architecture.

c) Further improve the capacity to undertake collaborative research involving academia and practice by creating funding sources that are open to practitioners and respond to the way in which the industry works.

d) Encourage more funding aimed at practice-based research, with greater support from other industry organisations and professional bodies. In particular, funding mechanisms need to be developed for BPE.

e) Improve the way in which UK architectural practices can secure government projects by demonstrating their excellence in research and innovation, rather than the size of their office staff or previous construction projects.

Introduction

Demand for housing, coupled with the need to provide high quality, sustainable housing, presents a significant challenge for Volume House Builders. The outcome of this challenge is highly likely to impact on the design quality, which recent reports have already identified as poor (CABE, 2009; RIBA, 2011). This highlights a pressing need to develop housing design knowledge in order to facilitate innovative outcomes that respond to current and future constraints and requirements.

The principle aim of this report is to develop a picture of the current state of housing research within architectural practices in the UK. It will act as a benchmark for research practice in housing; a point against which future housing research can be measured and assessed, meaning that less time will go into investigating research that has already been done. It will help identify where innovation is happening and where it needs to happen, in this way facilitating knowledge exchange between the profession and academia. Although very little has been written on the current state of housing research, a recent report from Scotland (RIAS, 2005), a draft report from University College Dublin for the Irish Government and a forthcoming report from the RIBA highlight the urgent need for a more co-ordinated approach to research within architecture.

Context

Architectural practice is prevented from doing research by cultural barriers within the profession's organisation (Imrie & Allen, 2010). This stems from a weak conception of the nature of research, its role in practice, and its relationship with design (RIAS, 2005). There are a number of factors that contribute to this:

– A reduction in support of the value of architectural design from organisations such as the Commission for Architecture and the Built Environment (see for example; CABE, 2006a; CABE, 2006c; CABE, 2006d; CABE, 2003).

– A misconception of what research is.

– An inability to express the value of design research and a lack of benchmarks for current research, which make it difficult to evidence originality or innovation.

It is not an easy task to define the link between research and practice. Where other professions, such as medicine, can illustrate the link between research and practice, the products of architectural practice (buildings) and their contexts, are subjective and not so easily explained (Fisher, 2009). Jeremy Till (2001: 8) articulates; *"Research-by-design often breaks the grip of instrumental rationality inasmuch as it involves creative synthesis."* This can be seen in the way that certain design approaches involve *"analysing the issues at stake, acting with intent, and moving to the production of new forms of social inhabitation and engagement"* (ibid). These are new forms of knowledge disguised as buildings. Design, then, can be research when it has followed a rigorous and critical path that leads to new insights for design practice.

Introduction

In 2011 the RIBA Building Futures report, *The Future for Architects?*, concluded that, despite economic turmoil, *"the opportunities for architects have never been greater"* (Building Futures, 2011, p.39). It is our belief that the collaboration between industry, architectural practice and academia provides one of these opportunities. As such, research and innovation is one of the five key strands in the RIBA's strategy 2012-16 (RIBA, 2012, p.5).

According to Freidman *"a field must grow large enough and rich enough to shape results and circulate them. As this happens, the disciplinary basis of the larger field also grows richer. This leads to a virtuous cycle of basic results that flow up toward applied research and to clinical applications"* (2000, p.23). Architecture in the UK, and perhaps globally, has yet to reach this stage. One of the difficulties with research in architecture is that much of the knowledge is tacit. Owen & Dovey (2008: 11) state; *"architecture's bias towards the tacit weakens the dependability of the knowledge base and leaves the field open to colonization…"* Through developing the research base of the profession we will be better positioned to articulate the value and impact of what we do.

This report will clarify the extent and nature of research in practice through examples of how it is being undertaken. Moreover, it identifies current challenges to research, demonstrating how these might be overcome; illustrating how research can benefit architectural practice, as well as the profession as the whole. It is the first of a series of planned reports on aspects of UK practice-based research. It has been written in conjunction with the *RIBA Research in Practice Guide*, a process map for research in practice directed at practitioners who are interested in developing this aspect of their work. The report also forms part of a broader project focussed on testing methods of knowledge exchange between architectural practice, industry partners and academia. The project, known as *Home Improvements*, is funded by the Arts and Humanities Research Council (AHRC) and led by the University of Sheffield in partnership with the Universities of Edinburgh and Kingston and industry partners Taylor Wimpey, Design for Homes and the registered social landlord Radian. The findings of this report are based on this project, a web based survey of RIBA practitioners and a series of interviews with a range of housing practices. This project was carried out with the support and guidance of the RIBA through its Research Team and Research and Innovation Group.

Structure

The first section of this report reviews practitioner's thoughts on practice-based research and the current state of knowledge in housing. This data was collated through an online survey distributed via the RIBA, and through a series of interviews (a full review of the methodology can be found in the supporting document to this report). From the data, three models of research that are active in practice have been identified.

In order to define the current state of housing research in practice, what constitutes practice-based research must first be determined. Hence, the second section of this report provides three case studies of practices that place research at the centre of what they do. These case studies illustrate how research can form a part of practice, in addition to identifying how research can form a fundamental part of a practice's business strategy. Following this, the third section provides a further five case studies of projects by practices actively developing housing knowledge through research.

1.0 The Current State of Housing Research in Practice

We describe here the current state of research in architecture and present the results of the survey of RIBA practitioners. A series of semi-structured interviews with architectural housing practices and developers, from established, expert practices, to small, up and coming housing practices, supports the survey.

1.1 What is Research in Practice?

The survey responses suggested difficulties in defining research. Many answers used a project as a vehicle to describe research. Most often these were associated with quantifiable measures, such as energy efficiency. This suggests a view of research that is limited to quantitative issues.

I don't think everyone shares exactly the same view. In our practice, without a doubt, research is integral. But the debate is about how we carry out that research, and who should be carrying it out.
(Architect, Medium Practice)

Our findings back up other studies in this area which reveal that architects do not have a strong conception of what research is. The question *"In the context of your practice, how would you define research?"* elicited various responses, from *"very important"* to *"The creation of new knowledge relevant to innovation"*. However three models of research were discernible:

– Knowledge Management

– Design Development

– Research Projects

Knowledge Management is conducted by every practice, in some format, as part of the course of design. It is the process of collating and organising relevant design information that ensures that practices are up-to-date with prevailing technology and regulation. Practices referred to this as an integral and imperative aspect of practice. Descriptions included; *"exploring new areas of information and knowledge and reaching a point of view"*; *"investigation into new products and techniques and applied design exercises"*; and *"research into/development of standards/ guidance"*. However, perhaps the most telling description of this type of activity was that: *"[research is] part of our job... from materials to city and policy contexts, we need to know what has happened elsewhere."* This resonates with the findings of a Scottish survey (RIAS, 2005), in which this model of research was coined *"'search' activities for information, often project based but not exclusively – many practitioners do not consider this to be 'real research.'"* The findings of our investigation suggest that knowledge management has an elevated importance in practice, providing the basis for research projects and design research, in addition to informing day-to-day practice. In some emerging fields where existing knowledge, in particular guidelines and regulation, becomes complex and fragmented, the process of managing and organising is itself a process of research, which leads to meaningful insights for design.

1.0 The Current State of Housing Research in Practice

Design Research has been previously observed and defined by RIAS (2005, p.5) as; *"activities which range from investigating specific solutions to prototyping – these are usually project based and range from reflection in action to more stand alone investigations."* If supported by explanatory materials, such activities are accepted by the UK Research Excellence Framework (REF) as a valid form of research. In our survey research included descriptions such as; *"looking into new methods of construction, software, communication, proving viability and effectiveness"* and *"collecting information, using it to develop experimental designs, then testing them against fixed criteria."* This includes research through design, where design projects are used as a vehicle to develop new knowledge. Amongst the practitioners we interviewed this approach generated a diverse range of findings resulting from analysis of material use, to studies of how people use space in the home and their aesthetic preferences. However, explaining these activities for the purpose of publication or dissemination is rarely mentioned.

Research Projects, which the RIAS survey (2005) coined 'real research', was generally seen by practitioners as a fundamentally different type of research, one that didn't often happen in practice. However, where practitioners acknowledged it, they described it dismissively as *"a formal structured process that leads to a written paper or published report merely for the sake of research."*

Larger practices tend to be more engaged in research and development and sometimes even have their own research division. Whilst the view, now common in UK academia, that research and design are synonymous was rarely acknowledged, there was some support for this concept from the practitioners we spoke to.

Any form of design is a form of research, because it's usually about a specific situation in a specific place, with specific constraints. The act of pulling all those different strands together and making something coherent that works and meets all of the different criteria, is a form of research.
(Architect, Small Practice)

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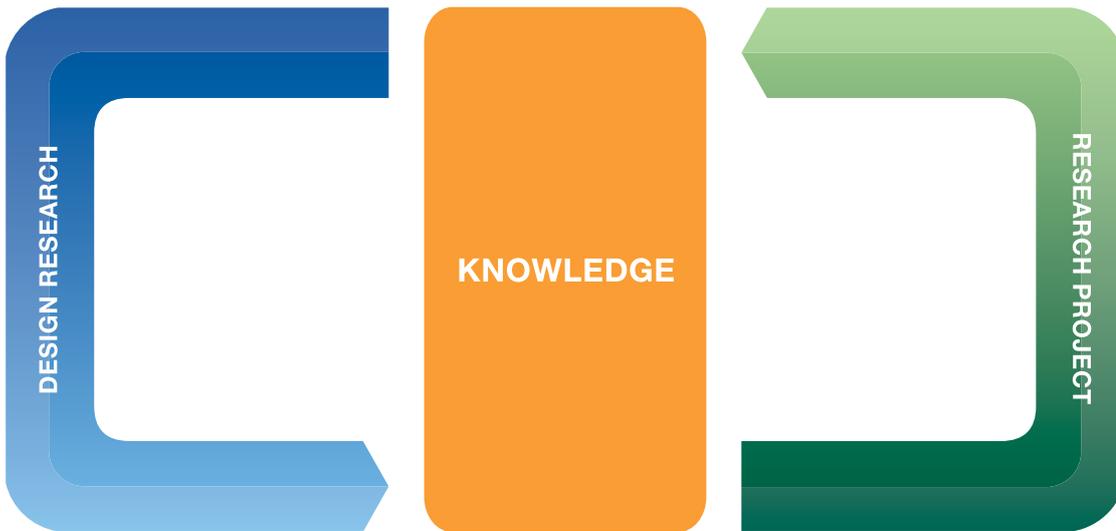
Fig.1. The Knowledge Loop

We propose that these three models of research – knowledge management, design research and research projects – are intertwined, forming a knowledge loop, which delivers new insights (Fig. 1).

We propose that research comprises four key stages, as the *RIBA Research in Practice Guide* (2013) illustrates. Sharing insights is a significant aspect of this process which feeds into subsequent forms of research in order to propel research findings. This stems from the REF definition, which serves to encourage research that has a significant impact for industry and therefore the economy (HCFCE, 2011). Parallel with this, we also suggest that knowledge management is not only an approach that helps practices keep up to date, but also a system in which new findings are stored, and which leads to further research.

1.2 Areas of Research

The interviews substantiate further Till's theory that research activity can be defined in terms of process, products, and performance (Till, 2008). However in our survey and interviews the research topics covered were typically quantifiable topics, such as, environmental performance. For example, post-occupancy evaluations that lead directly to environmental performance improvements in subsequent design projects were more typically considered 'research'. Whereas, the 'reflection in action' of certain building elements, tested through drawing or model making, was considered more a part of the design process than research.

1.3 Benefits of Research

Interviewees suggested that good knowledge management and secondary research kept them up to date and helped them hold their position in the market.

Many practitioners had difficulties describing the benefits of research, however, those who were involved with research projects identified that research gave them a strong position in presenting their design skills to clients. Practitioners who answered the survey suggested that the primary benefits of research were that it would improve the built environment and demonstrate the value of architecture. Further, and ranked most important in the survey responses, was that research plays a fundamental role in job satisfaction. The interviews allowed a more detailed description of why practitioners valued these benefits. On the one hand they recognised the significance of research for developing the practice's knowledge base and market position, something potentially attractive to specific clients, which chimed with 'the ability to demonstrate expertise'. On the other hand, they also indicated that certain commercially minded clients might discourage a research-based approach, fearing that their project would be used as a research vehicle and therefore release commercially sensitive information and potentially detract from the delivery of a building. This was also voiced as a reason for not pursuing publishing beyond the professional press and practice monographs by practitioners.

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I think ultimately, it makes us better problem solvers when we ask ourselves questions and it makes us more efficient at what we do when we approach work in that way, and certainly when we build up a body of answers through having asked these questions. That's very satisfying potentially making you even more efficient because you've added to your toolbox.

(Architect, Large Practice)

1.4 Disseminating Research

I think the challenge is communicating that information to someone who hasn't actually done the research. It's quite difficult to write in a way that is meaningful and helpful to someone else.

(Architect, Large Practice)

A further reason for the lack of publication of practice-based research appears to be the confidence of practitioners in communicating research proposals and findings through writing. This seems to be a real barrier to research, which could be overcome by using practitioners' strengths in drawing and creativity. For example, film and blogs are becoming popular sources for exchanging ideas and knowledge. Many practices now share information on their current projects through blogs, one example of this is Architype.

One of the difficulties is keeping it simple. You have got to keep things simple if you're going to appeal to a fairly wide audience. But you've also got to make sure that they're not so simple that people will take them the wrong way.

(Architect, Large Practice)

Many practitioners found it difficult to explain design research projects and order ideas in a rigorous and systematic way, something that could be disadvantaging them in communicating with non-architects. This, we suggest, poses questions for architectural education. Architects, we argue, should be at

a distinct advantage in this area, as they have the ability to communicate complex information sets through graphic and other means.

1.5 Attitudes Towards Research Funding

Wide ranges of funding opportunities are available to practices interested in research, but only a fraction of the survey and interview sample said they had received research funding.

As the Scottish survey showed, practitioners had little awareness of funding opportunities that might be available to them (RIAS, 2005). There was a feeling of ambivalence towards this issue suggesting that practitioners are more likely to do research for altruistic reasons rather than as a means of generating income. It is seen as part of the on-going development of tacit knowledge. However, if practices were looking for funding to do research, they said they would look to academic partners and the RIBA for initial advice.

The most prominent barrier to research was time and therefore cost. The impression was that research required financial backing and substantial resources (particularly in terms of staffing) in order to produce something of substance. One practice we interviewed suggested that if they were to incorporate research into their practice they would have to give thorough consideration to the availability of senior members of staff to supervise research and in particular consider the cost implications of this.

Architects indicated that one of the best ways to do research or test an idea, was through competitions.

A developer we interviewed conveyed the same message. We argue that there are many parallels between applying for architectural competitions and applying for research grant funding; both hinge on the demonstration of value.

1.6 Housing Research in Practice

Practitioners suggested that the most important housing research was taking place in practice.

Roughly half (45%) of the survey responses said that they practiced housing research of some description. Our interview sample comprised mostly of practices that specialised in housing, or at least had a select portfolio of

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housing practice. Of these, roughly half classed themselves as research practices.

From within the arena of housing it became apparent that knowledge management was a significant model of research because of the amount and distribution of guidance and standards for housing, not to mention the continual advances made in technology and materials.

There's a whole variety of stuff that isn't rocket science that does change over time, but not very fast. On the other hand, there are technologies, which move very fast, and so product research and how to make your home more airtight – all of that is a very different strand, which lends itself to a more academic form of research.

(Architect, Large Practice)

Practices commended other more altruistic practices for their knowledge management and for sharing information online. In one area of housing, design for old people, Levitt Bernstein and PRP brought all the key documents together in a compendium for the benefit of others. Similar projects have included the work of Joanne Denison and Chris Halligan of Stephen George & Partners, whose project, *Building Materials and the Environment*, provided a compendium of construction materials and their environmental impact.

Practitioners often found it difficult to say where research was needed in housing. Some practices were specialists in green technology and sustainable design, while others specialised in housing for wheelchair access and the aging population. There were only a few cases where practitioners were engaging with design research in a way that was geared towards influencing mainstream mass housing. One of the key challenges was seen to been needing to develop ways to engage with the commercial demands of Volume House Builders.

...if you want to influence house building nationally then, you've got to be mindful every step of the way, of how research can feed into the ordinary home, with all the commercial pressure

that leads them to be so ordinary. It needs very small steps; you're not going to change habits on that scale over night.

(Architect, Large Practice)

Perhaps the most worrying finding of our research was that Building Performance Evaluation (BPE) remains an aspiration for most practices.

There was a general feeling that BPE was vital for developing the knowledge base but that it was unfeasible under the current fee regime, although attempts to improve this through the *RIBA Plan of Work 2013* have yet to bear fruit. Other barriers to BPE included the value of such research to the client; in cases where the client has no long-term interest in the building, they have less interest in investing in studies of its performance.

1.7 Recommendations

Overall, our findings paint a gloomy picture of the current state of research in practice, yet there appears to be an emerging desire to improve this. It is important therefore that the research content of practice is recognised, valued and developed. To help achieve this practices may benefit from the following:

– A shared definition of research and clear process map of research routes for practices wishing to develop or expand their research portfolios.

– Assistance from professional bodies and academia with identifying when research is appropriate and establishing the best ways in which to conduct research. In particular, universities need to do more to help new architects to develop rigorous research skills.

– Greater exposure to examples of research based building evaluation, perhaps through the professional press or through the way in which competitions are assessed.

– Ensure that opportunities and support are available across the UK.

2.0 Research Practices

For some practices, research is an integrated aspect of business and they consider that their unique selling point derives from research. An important historical example is the work of John Duffy and John Worthington who did much to develop DEGW as world leaders in the field of organisational design. Here research is seen as integral to the practice's business model. In this section we will draw out some of the characteristics of such practices and the benefits they derive by foregrounding research as part of their practice's ethos.

We provide case studies on the following practices:

2.1 Architype: A Business Model for Research

2.2 PRP: Exemplary Knowledge Management

2.3 Urban Splash: Innovation through Competition

These practices were chosen to provide a view of research from different perspectives, including the nature of the work undertaken and the size of the practice. Architype are a highly research-driven practice, developing ways of integrating the *Knowledge Loop* into their business model. PRP, provide the perspective of a large, multidisciplinary practice and are considered true experts in housing. It is important to also consider the role the developer in this context and the potential they have to facilitate research, therefore, we include a case study of Urban Splash.

To identify the types of research that each of these practices engage with, we highlight the relevant parts of the *Knowledge Loop* at the start of each study.

2.1 Architype: A Business Model for Research

Architype is a medium sized practice with offices in London and Hereford. The practice is widely acknowledged as a leader in the field of low carbon, low energy and environmental design that engages with the needs of users. The practice's work covers a range of sectors and they work towards delivering tangible and affordable solutions that work at every level.

The practice's ethos was developed out of their very first self build projects 30 years ago. The practicalities of self-build, the necessity to keep it simple and involve the end-user at all stages have become an embedded part of the practice's philosophy. Research now forms a fundamental part of Architype's work, evidenced through their commitment to post-occupancy building evaluation and incorporating feedback into future design.

2.1.1 Approach to Research

Architype are active members of the UKGBC (UK Green Building Council), ASBP (Alliance of Sustainable Building Products) and the Passivhaus Trust, which assists continuous improvement to design work, and provides factual information that supports the practice's research and drives new research agendas.

Architype speak regularly at sustainability events and forums, and contribute to regular seminars and write briefing papers. Within the practice research and findings are disseminated via their in-house blog 'Archiwiki' and at daily teatime informal discussions. On an annual basis, both offices break away from normal working duties for a minimum of two days and come together to discuss ideas and research.

2.1.2 Benefits of Research

From Architype's perspective, one of the key benefits of research is that it enables the practice to demonstrate their commitment to projects to prospective clients. It also proves that their evidence based and cyclical approach to practice and research offers clients a more complete service.

When you can say, we've gone back and looked at a minimum of ten of our buildings and we found that some of these things were wrong, but we've got a process for fixing and understanding them better, and subsequently changing our methodology based on those findings, client's think its great. In fact, they expect it should be standard practice.
(Jon Ackroyd, Architect)

For Architype this evidence based approach to architecture, the development of an in-house tool, *RAPIERE*, to analyse lifecycle carbon and costs, and their fluency with Building Information Modelling (BIM) and Passivhaus Planning Package (PHPP) has helped the practice build confidence in improving sustainable strategies. This has led to plans to guarantee the performance in their future buildings backed up by their own evidence.

2.1.3 Research Organisation

Architype maintain their commitment to research by prioritising it within their business model and actively seeking out funding sources.

In 2006, Architype put its research into practice through the design of its new office in Hereford. This was recognised in 2009 by the prestigious Ashden Award for Sustainable Energy. The prize money from this award was re-invested into a two year Knowledge Transfer Programme (KTP) with Oxford Brookes University to analyse ten Architype buildings post completion. This in turn has led to further research. Parallel with this virtuous cycle of research, Architype have divided their research into four types:

Project Based Research is background research that is carried out on all projects. It includes building specifications, keeping up to date with legislation, standards and contacting manufacturers.

2.1 Architype: A Business Model for Research

Internal Strategic Research is conducted where an area of interest or need is identified within the practice and internal funding is provided to develop a particular area of interest.

The Enterprise Centre at the University of East Anglia is a core example of this. It included the adoption of a *Soft Landings* programme from the outset, the incorporation of Passivhaus improvements documented from findings on their completed Passivhaus schools, research into local low embodied carbon materials, the use of *RAPIERE* to analyse building form, cost, energy – embodied and operational, designed in BIM and processed through PHPP.

This form of research has also lead Architype to assist ArchiHaus in developing their vision; to address the UK housing markets' poor performance in terms of the housing layout, construction methods, energy efficiency and quality of life. Together they have recently gained planning permission for a 150 unit Passivhaus living community in Herefordshire. Architype's work on the project to date has involved, but is not limited to, researching modern methods of construction, with the intention of ArchiHaus developing a house factory that will produce complete composite panels with appropriate levels of insulation for a quick erection on site. Architype's current research challenge is detailing the panels in such a manner that they are simple enough for off-site prefabrication whilst achieving high levels of airtightness.

Externally Funded Research refers to research that has sought funding to investigate a specific area of interest. Examples include Architype's recent collaborations funded by the TSB to undertake detailed Building Performance Evaluation (BPE) studies of two completed schools; Bessemer Grange Primary School, East Dulwich and Staunton-on-Wye Primary School in Herefordshire. Architype has been responsible for collating information which provides insight into the design strategies, building fabric, target performances, including; temperature, CO_2 levels, thermal imaging, construction methods, occupancy patterns, handover and operational practices. This will form part of a report comprising the findings of 100 buildings, which address bridging the performance gap between pre-construction energy targets and actual readings whilst in occupation.

Consultancy Research. Architype is employed by other organizations to provide specialist research capabilities. This includes Passivhaus consultancy and Life Cycle Carbon Analysis.

2.1.4 Summary

The virtuous cycle of research demonstrated by Architype is in many ways a true example of how the knowledge loop can support and advance architectural practice. Architype maintain that fee-paying commitments take precedence in this loop and strive to develop ways to embed research into this.

2.2 PRP: Exemplary Knowledge Management

PRP is a large multidisciplinary and international practice which specialises in general and specialist housing development for the public and private sectors at all scales, and has experience of mixed use, commercial, retail, healthcare, hotel, education and leisure sectors. The practice has a number of offices and their experience in delivering successful projects in these sectors leads to its interest in research and development of the areas of its expertise.

2.2.1 Approach to Research

The research projects that PRP undertake can be commissioned pieces of work with a defined outcome, internal research as an investment to secure market advantage or investment in wider industry issues that lead to betterment beyond the interests of PRP. Research is undertaken by groups and individuals in groups who have the specialist knowledge in the subjects at design, technical or delivery levels.

PRP often also collaborate with other like-minded practices to conduct research, such as Levitt Bernstein and PETa. The practice is affiliated with a wide number of industry organisations and professional bodies. The practice leaders are also experts in housing and are closely affiliated with the Highbury Group for Housing Delivery, the UK Green Buildings Council, and the Housing LIN.

PRP have produced a number of reports concerning housing design, delivery and quality, which have provided benchmarks for the industry. These include:

HAPPI Report: In 2009, PRP was represented on the Housing Our Ageing Population: Panel for Innovation, which entailed research into alternative forms of development and standards for housing for older people and resulted in a highly influential report on improving housing options for older people.

Beyond Ecotowns: Lessons from Europe: In 2008 PRP published the findings of research into the successful ingredients to large-scale development and sustainable urban extensions in the context of plans to build eco-towns. It set out criteria for choice of location, financing, designing and managing new settlements.

Superdensity Study: In 2007 PRP, together with three other architectural practices, published an influential report with ten recommendations for design standards for housing in high-density development, which in part led to the standards set out in the London Housing Design Guide.

High Density Housing in Europe: In 2004 PRP was commissioned by a client to research housing standards in Europe to determine best practice in high density developments. The research led to the first exposure of Hammerby Sjodstadt in Stockholm that has since become a benchmark of delivery, quality and sustainability performance for new urban extensions.

2.2.2 Benefits of Research

I think when you are so fully immersed in one area of work, there's a need to be constantly better informing yourself about what others are doing and how you can learn from them. Learning from overseas, and recent history in terms of how housing is conceived, designed, delivered and managed. As a practice we have a mind-set to be one step ahead, to be thinking about what might come round the corner and what you might need to prepare for.
(Andy von Bradsky, Chairman)

2.2 PRP: Exemplary Knowledge Management

For PRP, research is a crucial part of maintaining their status as experts in specialist fields. The practice aspires to remain highly informed on a number of subjects, in addition to meeting an expectation from the wider market.

2.2.3 Research Organisation

The research that PRP undertakes can be defined in line with the three models of research we present within this report:

Knowledge Management

It's not always a research project, it's responding to the things that are out there, being right at the front end and influencing policy or legislation.
(Andy von Bradsky, Chairman)

PRP's knowledge management aims to co-ordinate the broad array of standards and guidance in their areas of expertise. This places the practice in a strong position to advise clients, policy makers and other vested interests on the best approaches to design and technical delivery. This is not research per se, but positions PRP as 'thought leaders' and influencers in a competitive environment and through such expertise positions PRP well to pursue research projects. This is not only beneficial to their employees, but through the production of fact sheets and undertaking reviews of prevailing design guidance and information available on their website, many other practices look to PRP as leaders in housing.

Research Projects

PRP has been involved in a number of research projects. It is currently involved in undertaking a major study that documents how the occupation of buildings affects energy use. The study is intended to inform solutions which will lead to lower energy use by consumers. The project involves working with social research teams, product manufacturers and government. The outcomes of the study will provide an evidence base from which to influence policy and industry standards as well as product and commercial solution development.

Research Projects and Design Innovation

In order to progress its position PRP has recently formed a new business venture, *Innovate at PRP*, which will specialise in research projects, specifically in technical innovation. The objective of the business is to do research and development work that leads to innovative practical outcomes for the construction industry such as design, process and product solutions. Projects will largely be undertaken for external clients and will be delivered through utilising PRP's wide range of expertise as well as collaborating with other organisations within and external to the construction industry. It will be a delivery vehicle for other forms of independent research to be undertaken by PRP.

2.2.4 Summary

The rigorous examination of the parameters informing housing design leads PRP to be recognised as experts in housing. In turn, this strengthens their market position and places them as leaders in many breakthroughs in housing design.

2.3 Urban Splash: Innovation through Competition

Urban Splash have offices in Liverpool, Manchester and Birmingham and are widely recognised for their award winning regeneration developments. Whilst Urban Splash can be better described as developers, regeneration specialists and house builders, it is important to acknowledge the role that they have played in developing UK housing design, contemporary urban design and urban regeneration often through a research led approach.

Their work stems from an interest in cities as a context for living and the future of urban form. This has meant that their approach to development has pursued innovative architectural design and that their residential projects have always been considered integrated aspects of a community, with their developments comprising a mixture of homes, retail and offices as part of a broader urban context.

2.3.1 Approach to Research

Urban Splash do not formally describe themselves as research-based developers, as they consider the work they do to be part and parcel of design and development, however, their interest in the city and future forms of housing motivates them to pursue a strong evidence base for both their design and business activities. Their recent publication,

Transform (2011), documents their developments and discusses the history and critical thinking that has informed their work. This demonstrates that their success has been the product of the careful consideration of existing urban contexts and the fruits of collaborative design partnerships, ultimately based on a strong tacit knowledge developed through extensive secondary research and practice experimentation.

One aspect of their work involves ensuring that homes stand up to the values of the contemporary market. In this regard, Urban Splash challenges their design teams to deliver contemporary designs that are flexible, in terms of both accommodation and construction. They appoint architectural practices to conduct active design investigations through design competition. Through this mechanism, participating architects are provided with a broad brief concerning the site, house sizes and delivery mechanisms to be accommodated; allowing architects as much freedom as possible to develop the best ways of approaching the design problem at hand. Examples of this include their work with Shed KM to shape a new terrace typology from existing Victorian terrace housing for Chimney Pot Park, Salford, (see Fig. 2) and more recently their collaboration with the same practice to develop a new-build terrace housing typology for a site in Manchester.

Fig. 2 Section through Chimney Pot Park Housing, Salford.

2.3 Urban Splash: Innovation through Competition

2.3.2 Benefits of Research

The approach Urban Splash adopts helps them to identify gaps in the market, which enable them to provide greater and more diverse consumer choice, in addition to making them particularly successful in creating developments with a strong identity.

A good example of this is the refurbishment of Park Hill, Sheffield, recently nominated for the RIBA Stirling Prize. The initial phase of refurbishment at Park Hill, Europe's longest continuous housing scheme and largest listed building, completed in the 1960s, was the result of working with architects Studio Egret West and Hawkins Brown. Its listed status required special consideration from the design team and the scale of the project demanded careful management and phased development. The nomination of the project for the RIBA Stirling Prize is testimony to the fact that Urban Splash's approach, and particularly their collaboration with architects, results in considerate and innovate design.

2.3.3 Research Organisation

Urban Splash's house building activities are supported by in-depth studies of the housing market, how housing is delivered, and the aspirations of house buyers within their target market. Whilst this may be a standard approach to development throughout the industry, Urban Splash's approach is distinct in the way in which they interpret their findings. To this end, they incorporate critical analysis, underpinned by an established understanding of contemporary culture and city living, which highlights new questions about current housing market mechanisms. For Urban Splash, this poses interesting problems for design, as well as business.

Their regeneration work is underpinned by research into historic and cultural aspects of urban development and living. They employ this knowledge to respond appropriately to site context. Moreover, historical and cultural investigations mean that Urban Splash's appreciation and understanding of the site exceeds the practices of most developers who can be preoccupied with the number of 'units' a site can provide. From this perspective, they see the number of homes as a single aspect of any development, which is embedded in a wide range of other qualitative issues, such as liveability.

The delivery of their design work is the product of facilitating design research in architectural practices, coupled with a close working relationship with architects. Market research leads Urban Splash to recognise the value of design and motivates their pursuit of innovative and unique design projects. This pursuit is realised through design competition between select architectural practices. It is a route that has previously led them to deliver designs that challenge established mechanisms in the housing market, in addition to the provision of housing as a product of customisation, rather than standardisation.

2.3.4 Summary

Overall, the importance of these innovative approaches for Urban Splash are that it reinforces their unique position in the market, ensuring that they can continue to respond to the needs of clients and users to deliver innovative and contemporary housing.
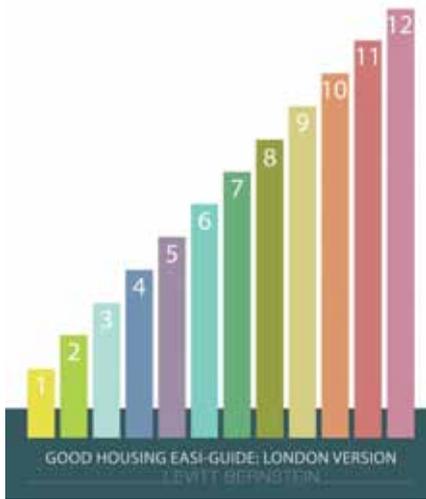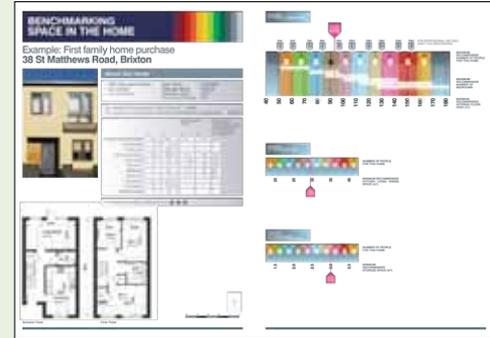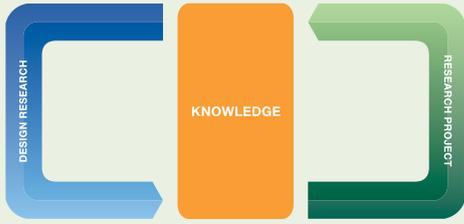
3.0 Housing Research Example Projects

This section introduces a series of research-based housing design schemes. A central aim in writing up these case studies has been to articulate practice research in a research format that would translate into academia, legible to non-architects and funding councils alike. Universities currently preparing for the Research Excellence Framework (REF) will have undergone a similar process in the presentation of design outputs by practitioner academics. The precise way to do this is a hotly debated issue. Here we use the classic elements of any research project: aims, context, methods and outcomes.

The following case studies have been selected from the practitioners we interviewed. Selections were made in order to provide a variety of examples of design research and research projects, as well as covering a range of housing topics to illustrate the diversity of research being undertaken in practice. We also aimed to include in this sample both well-established and emerging practices. We have categorised the topics of research as follows:

3.1 Proctor and Matthews: Economies of Detail

3.2 Levitt Bernstein: Space Planning Calculator

3.3 Pitman Tozer: Iterative Design

3.4 FAT: The Culture of Home Making

3.5 Wright & Wright: Designing for Older People

Again, we identify the type of research these case studies provide examples of by highlighting the relevant section of the *Knowledge Loop*.

3.1 Proctor and Matthews Architects: Economies of Detail

Proctor and Matthews is a medium sized architecture, urban design and masterplanning practice based in London. The practice has completed a variety of projects in numerous sectors and projects have been recognised by a number of awards. Their fundamental interest is in creating sustainable communities. In 2009, the practice published *Pattern, Place, Purpose* a collection of essays on topics that reflects their design approach and the issues that inform their design aims and objectives.

3.1.1 Research Approach

We are interested in flexible living and how you actually tailor housing more appropriately to the way that people want to live.
(Andrew Matthews, Director)

Their research primarily investigates how design elements can contribute to the creation of sustainable communities and how this often highlights interlinking issues. Proctor and Matthews consider research imperative to support the ideas of the practice and engender innovative ideas, providing the practice with a vehicle to explore issues, but most importantly with a pool of knowledge about those issues and how they can be manifest and resolved through design.

Through their research findings Proctor and Matthews are able to put forwards suggestions for planning legislation and motivate political agenda to encourage social sustainability to be considered at a much broader level in house building. From a business perspective, research is seen as an investment in skills and knowledge by the practice, which draws in particular clients who share similar interests for architecture and urban design.

3.1.2 Horsted Park, Kent: Economies of Detail

A good example of Proctor and Matthew's approach is Horsted Park, Kent which is a large mixed-use housing development providing over 300 dwellings, currently on site. It comprises community and retail facilities and a proportion of the homes are designated as extra care affordable housing for the elderly.

Aims and Context

The client required a low cost housing scheme comprising a range of mixed tenure, one and two bed apartments with two, three and four bed houses. The main ambition of the research, underpinned by the practice's longstanding social agenda, was to create an articulated and dynamic public realm, which provided the foundations for a sustainable community. Drawing on the practice's past experience and research, the development set out to meet the following objectives:

– Accommodate a collection of two, three and four bed houses, without clustering the same types whilst maintaining the developers desired wall to floor ratios.

– Deliver internal layouts that respond to contemporary living requirements, creating spacious living spaces.

– Provide a dual aspect, with the rear gardens and living spaces connecting with ribbons of landscape and front gardens providing threshold spaces to articulate the shift from the public realm to private space.

– Have back gardens that have a strong relationship to the living spaces.

– Have an appearance that intimates craftsmanship that is associated with creating a sense of place and pride for the development's occupants.

Method

Horsted Park is the product of an iterative process of testing, developing and analysing housing typologies in terms of construction cost and developer criteria. Testing began by setting out the aims in line with requirements and planning regulation. Design development was an integral part of the design process, where prototypes were developed and subsequently analysed against the initial criteria they intended to meet.

3.1 Proctor and Matthews Architects: Economies of Detail

Fig. 3 Horsted Park Masterplan

Outcomes

The aims and objectives are met through innovative masterplanning that uses ribbons of landscape running through the plan (Fig. 3) to allow a dual aspect to each house. This also reflected the local vernacular; drawing from Kent's farmstead layouts. Each house type, regardless of number of bedrooms is organised around a private courtyard/garden area, with the living accommodation on the ground floor each having a strong relationship with the courtyard. Front gardens provide an area bordered by low hedgerows and planting that enable neighbourly interaction within private spaces (Fig. 5). Using a standard palette of construction materials the façades of the houses are articulated by inset porches and brick and tile patterns that deliver a sense of craftsmanship within the construction budget (Fig. 4).

Fig. 4 Façade Detail

The project challenges the established understanding in mass house building that standard housing types, arranged in a terraced format are the key to producing low cost housing.

Fig. 5 Horsted Park Housing Façades

Many of the design approaches that contribute to the production of a sustainable community also challenge established approaches to security. In this regard, the research unlocked new questions about Secured by Design (SbD). According to SbD criteria, the articulated façade would provide access for thieves, whilst recessed porches and the front garden threshold provide potential hiding spaces. Instead, Proctor and Matthews argue that it is these elements that provide very basic security, by providing places to meet, greet and integrate with the community. This is based on rigorous analysis of established and popular historic house types.

The numerous awards attributed to the scheme highlight the success of the design. The project has won the Brick Awards 2012 and has been named Housing Project of the Year, 2013. It was also shortlisted for the Housing Design Awards and the RICS Awards 2013. Notwithstanding this, there is a need to study the success of the development over an extended period in order to provide a better understanding of how the design approaches used to deliver sustainable communities perform in the long term.

3.1.3 Summary

The findings of Horsted Park continue to be used in other projects, such as Proctor and Matthew's work at Clay Farm, Cambridge. Their innovative, research led approach to the design of housing is also opening up opportunities at a global scale, including a recent project for a mixed-use housing development in India.

3.2 Levitt Bernstein: Space Planning Calculator

Levitt Bernstein was established in 1968 and currently has a total of 80 staff across studios in London and Manchester. The practice works across a number of sectors and for a wide range of clients and is renowned for its housing expertise.

The practice has contributed to wide range of research publications. Julia Park, Head of Housing Research at Levitt Bernstein, contributed to the interim London Housing *Design Guide* (Design for London, 2010), *Lifetime Homes* (Habinteg, 2010), and co-authored the 2009 *HAPPI report* (Levitt Bernstein and Pollard Thomas and Edwards for the HCA, 2009), which looked at improving housing options for older people. David Levitt is the author of *The Housing Design Handbook* (Levitt, 2009), which uses exemplar housing projects by Levitt Bernstein and others, to illustrate good practice in housing design.

3.2.1 Approach to Research

Levitt Bernstein is research driven. It undertakes both commissioned and self-funded projects and often collaborates on research projects with other practices. They have a wealth of connections with private and public sector organisations and recently accepted an invitation to work with Government on its current review of housing standards. The practice adopts an informed and pragmatic approach through which it aims to improve the quality of mass mainstream housing, as well as to pioneer designs for more unusual and specialised housing.

The practice has developed a particular interest in housing standards and seeks to inform policy through its understanding of practice. The general aim of their research is to pull together the knowledge gained with a view to influencing and improving the overall quality and standards of mass mainstream housing, particularly in relation to internal space and accessibility.

3.2.2 Space Standards Calculator

This research project aimed to devise a new set of space standards for a complete range of house types. Levitt Bernstein's research into space standards began in 2008 and was initially triggered by unease about the minimum internal space standards of the HCA's Housing Quality Indicators (HQIs). They identified that mapping the standards in the form of a chart revealed no discernible pattern and some obvious anomalies. New standards were needed to provide floor areas that were reliable, capable of producing a variety of internal layouts and accommodating the furniture and activity spaces of HQIs in addition to the accessibility requirements of Lifetime Homes.

Aims and Context

A key objective was to devise a simple, logical and transparent methodology using a system that could be reviewed to encourage continual improvement over time. Although the research was initially aimed at affordable housing, the practice debated the implications of applying space standards universally. This meant weighing up the different priorities and occupancy patterns that are affected by tenure alongside the need to ensure that all homes are fit for purpose and the reality that new forms of tenure are constantly evolving and will continue to change over time.

Method

The research adopted an experimental methodology, which involved identifying key variables that informed space standards in a range of housing types and identifying patterns between these and floor areas in order to establish spatial standards and how to calculate them.

The first stage of the research process drew on 40 years of design experience and knowledge of the best housing standards and involved documenting the sizes of successful and efficient house plans. A process of examining those plans, documenting areas and searching for numerical patterns followed. Once a pattern was identified a formula was produced that provided the basis of the calculator (Fig. 6). This was a process of testing and developing to ensure that the formula produced suitable results for the whole range of housing types.

3.2 Levitt Bernstein: Space Planning Calculator
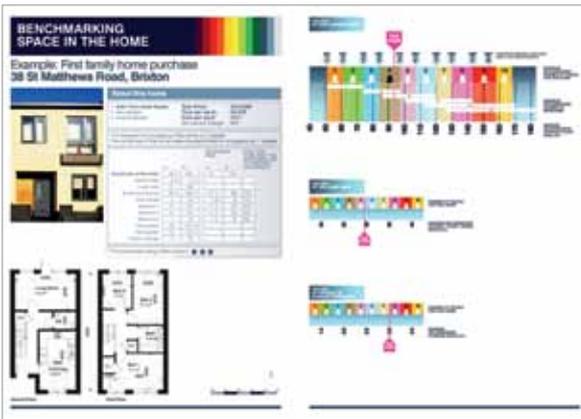
Fig. 6 Example of benchmarking space in the home

Aware of the inter-dependency between space and accessibility, Levitt Bernstein adapted the formula to produce a smaller set of space standards that respond to the lesser requirements of Building Regulations Part M, and a larger set that reflect the needs of wheelchair users. They also proposed re-organisation of current accessibility standards to form a corresponding three-tier accessibility standard.

Outcomes

The calculator and a model set of house and flat plans were offered to the Homes and Communities Agency (HCA) who published them as part of the evidence base in their Core Housing Design and Sustainability Standards Consultation (HCA, 2010).

More recently, the Greater London Authority (GLA) made use of the space calculator when producing the *London Housing SPG* (GLA, 2012). This came about because at consultation stage, respondents had requested a larger range of space standards than the 16 figures included in the London Plan. The calculator was able to generate areas for an additional 61 dwelling types instantly.

Levitt Bernstein believes the calculator has even greater potential, with the following possible outcomes:

A national three-tier space standard could play a part in improving housing quality beyond London. By coupling it with a three-tier accessibility standard it could simplify compliance and significantly improve housing choice for older and disabled people.

As a benchmarking tool it could help homebuyers to identify homes which are considered to be an appropriate size for their household. It could help to prevent or identify over-crowding because it links 'safe levels of occupancy' to a defined amount of space. As Julia Park points out, *"downsizing, or 'right-sizing' as we prefer to call it, is going to become an increasingly important objective but in seeking a 'better fit', we have to reach a common understanding about how much space people need to enjoy decent quality of life, rather than just how many bedrooms they should be allowed".*

3.2 Levitt Bernstein: Space Planning Calculator

The calculator also contributes to knowledge by virtue of the systematic methodology that has been developed, the simplicity with which the calculator can be used, and the fact that it is both robust and flexible. By adjusting the values assigned to the variables and the starter figure it has already proved able to deal with an infinite range of dwelling types, and a wide range of physical need.

The practice has used its work on space standards in a number of ways, both internally and externally. In 2010 the practice produced its *Easi-guide to Good Housing Practice* (Fig. 7), which combines the space standards and other internal dimensional parameters with some tried and tested housing design principles. This primarily acts as an in-house training tool; saving the practice time and money.

Looking ahead, there is the flexibility for further adjustment. Values could be adjusted periodically to achieve incremental improvement to ordinary mass housing, or altered to address any specific needs that may come to light through, for example, badly needed research into the every day spatial needs of wheelchair users.

3.2.3 Summary

Julia Park suggests that one of the benefits of being a research-based practice is that both the findings and the methods of inquiry can become a practical tool to improve design and add value, as well as to challenge policy.

Ultimately research is about developing the skills that help us resolve specific challenges and help bring about incremental improvement to housing generally.
(Julia Park, Head of Housing Research)
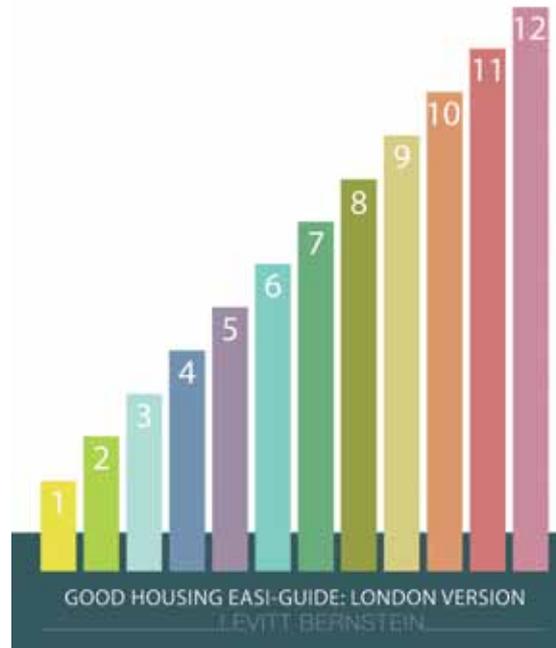
Fig. 7 Easi-guide to Good Housing, Levitt Bernstein

3.3 Pitman Tozer: Iterative Design

Pitman Tozer is a small London based practice specialising in designing and delivering residential projects from private houses to larger developer housing. The practice has developed an expertise in designing on complicated, heavily constrained sites. This requires skilled space planning to maximise daylight and to create high quality places to live.

3.3.1 Research Approach

The practice was initiated with the intention to ensure that research was central to design activity, dedicating some time each week to expanding learning and knowledge in a relaxed way that encourages the team to investigate topics of personal interest. As a small practice, it is often challenging to balance this with project demands. However, director Luke Tozer's active role in the RIBA Housing Group and the RIBA Procurement Reform Taskforce, provides the practice with a good awareness of current activity in housing research.

The practice often conducts their own self-directed research, however they have also previously been commissioned to carry out research by the local authority of the Royal Borough of Kensington and Chelsea and the local MP of Peterborough. These investigations included examining the refurbishment of disused spaces, in addition to exploring the implications of housing typologies and densities for a particular site.

Much of the practice's research is design research. It relies on using design as a method of active investigation to find an evidence base for specific design approaches, often related to environmental improvements. The nature of the research has meant that the practice has undertaken research with a number of other consultants, typically environmental engineers.

Research commissioned by local authorities has played a role in shaping planning policies for the respective areas. This not only provides the practice with good knowledge of the planning requirements of those areas, but also provides a strong knowledge base for other design projects. Additionally, with changing client and stakeholder requirements, and a changing landscape of regulation, design standards and guidance, research through design has provided the practice with a skill set that enables them to apply learning to housing design on specific projects.

3.3.2 Housing for Peabody: Active Design Investigation

Located in Bethnal Green, East London, the scheme provides 67 new homes. An active railway restricts the southerly perimeter of the development site, creating issues concerning noise, pollution and site access.

Aims and Context

The practice was asked by Peabody to deliver a feasibility study of the site, which had previously failed to acquire planning for student housing for a different client. The feasibility study produced by Pitman Tozer informed the client's decision to invest in the site, subject to planning.

The primary aim of the project was to overcome the issues related to site restrictions, in addition to delivering the high quality living spaces anticipated by the client. As social housing this included a strong desire to provide innovative apartment layouts and give special consideration to energy efficiency. The constraints of the site were not only physical restrictions, but their southerly aspect presented a challenge for building orientation: if overlooking the railway, the development would benefit from the southerly aspect and views in that direction, but would also have to address noise issues in order to benefit from these. As a result there were two main research objectives:

– Investigate and establish a method to maintain views and provide a noise and pollution buffer zone between the building and the railway.

– Explore layouts that provide contemporary living spaces.

3.3 Pitman Tozer: Iterative Design

Method

The research involved surveying and adapting precedents in order to derive a suitable solution. Working closely with engineers, the first stage of the research was to identify the implications of established methods of delivering acoustically sealed buildings. Many existing solutions suggested that apartments should face away from the railway line, closing the building off to the source of noise and using specific sound insulating materials. This would result in a north facing building, which therefore would not benefit from direct sunlight. This led Pitman Tozer to explore methods of creating a buffer zone that would create a sound barrier, whilst allowing the building to overlook the railway.

Outcomes

The proposed solution was based on the concept of a winter garden. It included private external spaces covered in AstroTurf that provided a buffer zone to noise from the railway (Fig. 8). These spaces are designed as extensions to the living areas. The building also meets CSH 4 and incorporates communal heating, a mixed mode air source heat pump, 280 sq PV panels, a mechanical ventilation and heat recovery system and sedum roofs.

The long-term outcomes of this project are key. The success of the project will be revealed through building performance evaluations once the building is complete and occupied. Therefore, this project can be said to be the experimental stage of research. The analysis of the data, looking at whether the building performs in the anticipated manner, is the next stage. Pitman Tozer are in discussions with Peabody to establish methodologies for the data collection, analysis and dissemination of findings for this subsequent stage.

3.3.3 Summary

Pitman Tozer's approach illustrates how research provides a knowledge base from which to develop design, but most significantly, it highlights that it is important to recognise that design research is only the first phase of research. Following completion, building projects require substantial investigation in order to better understand actual performance.

Fig. 8 Peabody Housing, Pitman Tozer

3.4 FAT: The Culture of Home Making

FAT are a small practice based in London. Several of their buildings have won design awards, and in 2007 the practice were highly commended as Public Housing Architect of the Year.

Working with a range of prestigious clients, the practice has undertaken a range of design work and has an international portfolio of projects. Their work has been extensively published throughout the professional press and in books. In addition to architecture, the practice has been involved in producing and curating exhibitions. The directors, Sean Griffiths, Charles Holland and Sam Jacob, write widely, analysing cultural conditions and architectural interventions.

3.4.1 Research Approach

We would say all our design projects are a form of research.
(Sean Griffiths, Director)

The directors of FAT are affiliated with a number of prestigious academic institutions, which fuels their research interests and approach to design. Their expertise is also demonstrated through past engagements with the RIBA Futures Group, their writings, lectures and exhibitions, and the practice's recent role as guest editors for *Radical Postmodernism* (2011), an issue of *Architectural Design.*

FAT's approach to research has a strong cultural trajectory, informed by the relationship between architecture, society and politics. Research methods have included varied qualitative approaches and have lead FAT to investigate how architecture is represented in culture, in addition to how architecture performs as a mode of cultural production. This has led the practice's approach to design to embrace the chaotic and layered character of existing urban form. This diversity of activity and interest means that the practice operates in many dimensions and disciplines. Their research topics have included the following:

– DIY Culture, including the way in which housing is, and has been, occupied, altered and adapted.

– How housing typologies are portrayed in popular culture and what are the consequences of this for architectural design.

– How housing is portrayed through different forms of media, such as film, fine art, literature.

– The implications of design standards and the potential of architecture to change lifestyles in a more profound way.

– Designing to accommodate cultural and ethnic distinctions and diversity.

Everything we do is about researching some kind of issue, whether that's doing an exhibition, a book, designing housing. **(Sean Griffiths, Director)**

3.4.2 Islington Square, Manchester: The Culture of Home Making

Islington Square comprises twenty-three, two to four bedroom houses as part of the New Islington, Millennium Communities masterplan. The scheme involved rehousing existing residents on the site, living in low rise, 1970s local authority housing. The residents, who had aspirations for 'traditional homes', specifically selected the practice to design their new homes. The project was completed in 2007.

Context and Aims

The existing housing on site was laid out in a cul-de-sac. This planning style was predicated on the idea that 1970s working class families living in the city desired a suburban setting. The reality of this vision was quite different, leading FAT to question; *"what are the aspirations of the people who live in a particular place and how do you transplant those values into housing?"* As a result, the project aimed to deliver a better understanding of the way in which current residents occupied their homes and community, and in particular the cultural expressions manifest in their homes.

3.4 FAT: The Culture of Home Making

Methods

Consultation with the residents provided an overview of their aspirations. Whilst consultation typically forms a routine part of a design project, as most housing is speculatively built, FAT had the rare opportunity of engaging with the residents throughout the design project. One particularly pertinent finding, revealed by the residents through this, was that the alley to the rear of the houses which operated as a bin store and route designed in line with Secured by Design principles, also operated as a secondary network for neighbours to visit each other, making it a social space often stereotyped in northern working class culture.

A photographic survey, documenting the way in which residents had adapted and decorated their existing homes (Fig. 9), provided insights into residents' cultural expressions within their existing housing. This also provided a primary resource against which to analyse the aspirations of the residents. Elaborate DIY constructions were discovered through this method, revealing a series of particularly interesting references, manifest by a specific cultural group.

Fig. 9 Fireplace in existing housing, photographed by Sean Griffiths

The design process within this project serves as further a form of analysis, through which residents' cultural expressions were interpreted and subsequently manifest in design (Fig. 10). For example, through photographic surveys and discussion with the residents it was established that rather than open plan spaces they could adapt, their ways of living were better suited to rooms that held the potential to be adapted later.

Outcomes

The scheme was designed to meet the principles of Lifetime Homes and received an EcoHomes 'Excellent' rating. The scheme's award at the Housing Design Awards in 2007 illustrates the success of the design outcome. However, in terms of research, the project has become part of a much broader discourse on cultural production. The findings of the project have been widely documented in writings by the practice directors. Sean Griffiths presented a paper on the wider concerns of the research at the RIBA Research Symposium in 2007.

Following completion, FAT visited the residents at Islington Square and found that some of the most inspirational pieces of DIY that informed the design had been replaced by modern furniture. When asked why they had not recreated their interventions, the residents replied; *"We live in a modern house now!"* This highlights the unpredictability of responses to architecture and emphasises the importance of qualitative research.

Fig. 10 Street Party at New Islington Square, FAT

3.4.3 Summary

Research is part of the practice's identity and contributes greatly to the impact and value of its work. Qualitative research, like the example provided by FAT, is often overlooked. However, as this case study reveals, such research unlocks critical findings for housing which lead to new insights into contemporary housing requirements.

3.5 Wright & Wright: Housing for Older People

Wright & Wright are a small, London based practice that have completed work in the cultural, educational, office and housing sectors. They have won a number of awards for their schemes. The practice has a thorough understanding of social and economic aspects of the built environment and an expertise in community collaboration and consultation. This gives them a strong knowledge and skills base to develop research.

The practice has undertaken both commissioned and self-directed research and has contributed to a range of design guidelines and regulation for government and charitable organisations, in addition to building up a knowledge resource of their own to support their focus on developing designs for those with special needs.

3.5.1 Research Approach

We're really interested in those kind of early stage conversations of getting the clients aspirations right and spending the time with them to understand the brief.
(Stephen Smith, Partner)

For Wright & Wright, research is a key factor in ensuring that their design work responds to the requirements and needs of the client and occupants. In cases of specialist design where purpose built buildings are often scarce, research helps the practice move forward and pioneer new ways of accommodating occupants needs. Formal and informal post occupancy studies, conducted through close relationships with clients and occupants, help to support the practice in understanding which elements of design work well, and which require development. This adds to their expert knowledge and helps to ensure the practice continually develop their understanding of design.

3.5.2 Housing for Older People

The project case study that follows is a design research project focussed on developing apartment layouts for older people. The research is a feasibility study that investigates how extra care accommodation could be improved.

Aims and Context

We are very interested in the demographic of the ageing population and being more respectful to their way of living.
(Stephen Smith, Partner)

The brief for the project required the practice to consider how existing developer plans for extra care housing could be improved in line with Lifetime Homes Criteria to make the move to extra care housing a home from home experience. The challenge was to question preconceived ideas of extra care housing.

Observations of some existing extra care housing suggested that the independence of occupants needed greater consideration. In terms of internal spatial planning, this included:

– Ensuring that occupants had sufficient storage space for their belongings, to minimise the impact of downsizing.

– Providing spare rooms for family and guests in order that occupants could continue their social lives.

– Including a self-contained kitchen within each apartment in addition to communal dining.

In addition, the benefits of a strong connection to the outdoors have been demonstrated by the research that supports HAPPI. In response, Wright & Wright sought to develop an overall building plan that maximised views to the outdoors; providing well lit internal spaces and a strong connection with the gardens (Fig. 11). This not only served to maximise daylight, but also provided a means of assisting navigation and orientation.

3.5 Wright & Wright: Housing for Older People

Methods

The project followed rigorous analytical procedures. It is these procedures that allow findings and conclusions to be drawn from the research in order to contribute to design knowledge. There were five principle stages to the research process:

Initially, relevant information, such as current research into environments for older people, and regulatory and planning constraints was identified and translated into meaningful design objectives. Existing layouts used by the developer were examined and analysed against the findings of discussions and consultations with the developer. In research terms, this involved understanding the reasons underpinning existing the existing layouts and identifying areas for improvement.

The accessibility principles of the proposed layouts were tested by recording overlays of wheelchair movement paths on to apartment layouts. Ultimate testing of the layouts was achieved through market testing by the developer.

Fig. 11 Housing Layouts for Older People, Wright & Wright

Outcomes

The main output from this research was a report which documents the approach to designing for older people. It is disseminated internally within the practice and is used as a starting point to inform future projects.

The findings of the research provide an understanding of the principle elements that make up successful apartment layouts for older people. With further, post occupancy evaluation, this research provides a basis against which to evaluate the long-term benefits and success of the layouts. The MADE Design Review Panel commended the layouts implemented by the developer, stating that the *"relationship between client and architect had resulted in some very rational layout planning."*

3.5.3 Summary

Wright & Wright strongly support the idea that design constitutes research where it is conducted rigorously with an aim to develop new responses to spaces, conditions and requirements. Such research ensures that the practice has expertise in specific areas of specialist housing and education.

Conclusion

The case studies above provide inspirational examples of practice based research. However as our survey indicated, there is in general a limited understanding of research within the architectural profession. Design research is particularly undervalued. This, coupled with a lack of knowledge about the, often world class, research taking place in UK academia and the increasing importance of knowledge for the retention of market leadership, means that there is a strong need develop the profession's research base.

The recent curtailment of the activities of CABE is already impacting on the profession. The good work started by CABE in providing an evidence base for housing design is becoming increasingly dated and we are suffering from a lack of evidence to support the value of design in housing. This highlights a critical position for practitioners and indicates that the profession badly needs to combine its research efforts to illustrate the value in what we do.

Further research is urgently needed to develop the field of housing practice. However, as many practitioners rightly point out, design is not always research. To constitute research, there should be an exploration of specific elements, conducted with rigour. We recognise that practitioners do not always have the time or the capital to pursue design in this way and in a publishable format.

The practitioners that we spoke to note that there are significant gaps in knowledge, and areas of design and the delivery of housing that need substantial investigation to meet 21st Century needs. As the recent RIBA report *The Way We Live Now* (Ipsos MORI, 2012) identified, public aspirations for housing are not always focussed on the number of rooms, or the functionality of spaces, they are also driven by emotional responses that are not so easily conveyed and indeed, measured. Practitioners recognise that this calls for much more serious consideration of qualitative aspects of design, in particular, the culture and behaviour of occupants in relation to design and built form.

The practitioners we spoke to had a number of recommendations for improving the research culture within the profession, in this way providing better evidence for the value of architectural design:

– The procurement of housing was identified as a key area for investigation. Practitioners voiced that changes in the way in which housing was procured could result in significant improvments in quality.

– Socioeconomic systems that inform housing delivery were said to stifle innovation: mortgages and access to land were two particular concerns in this context. These systems need redressing with a view to improve housing quality and respond to contemporary requirements within the home.

– Post occupancy studies need to be integrated into the design stages and become part of a long-term arrangement between the client and the architect. It was recognised that the *RIBA Plan of Work* (2013) goes some way to achieve this, but more can be done to emphasise its importance.

Conclusion

– We need to develop a system for categorising research and providing information about the research specialisms within practice in order for practices to establish research partnerships. Research-specific networking events organised by the RIBA and Universities would also aid this.

– Practices need to be better informed about funding opportunities. They need support in writing funding bids.

– The RIBA President's Medal for practice based research provides an important step in developing the research culture of practice. Research led design needs to be supported and celebrated.

– It was felt that the professional press under represented research. Specific research articles in journals would help develop a better sense of on-going research.

– Workshops for practitioners would generate a better common understanding of research, how to do it and how to publish.

– There needs to be greater recognition of research through the CPD system.

– Schools of architecture need to provide a clear account of the research they are doing in order to establish partnerships with practice.

– An introduction to research skills and methods should be given in undergraduate courses. This should be taught in a way that clearly demonstrates the links between design processes and research.

4.1 Future Research

As global competition increases UK architecture needs to maintain its reputation for quality and innovation. UK practice and UK universities must work more closely together to develop evidence based solutions to what is known in the European research community as the 'Grand Societal Challenges'. A supporting document, also published by the RIBA, The *Research in Practice Guide* will act as a guide for practices wishing to embark on research. SCHOSA is simultaneously developing a database of academic research interests, currently available in pilot form. Part of this exercise involves the development of a taxonomy of research topics and methods currently in evolution with the help of the RIBA library. These are just some of the small steps necessary in advance of a cultural shift requiring contribution at all levels.

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Glossary

AHRC
Arts and Humanities Research Council
http://www.ahrc.ac.uk/Pages/Home.aspx

Archihaus
Developer promoting sustainable and inclusive approaches to development.

ASBP
Alliance of Sustainable Building Products

BIM
Building Information Modelling

Building Performance
Relates to how a building performs environmentally, socially, economically or culturally.

Building Performance Evaluation (BPE)
Investigation into the performance of completed buildings; assessing proposed and actual performance to establish were improvements can be made

Design Research
Research undertaken through design

Knowledge Management
Surveying, collating and organising reference materials for research

KTP
Knowledge Transfer Partnership

Passivhaus
Standards to improve building performance in terms of energy use.

PHPP
Passivhaus Planning Package

RAPIERE
Support tool for the design of low impact buildings.

REF
Research Excellence Framework. The system for assessing the quality of research in UK higher education institutions.

Research Project
Research projects conducted for design, but separated form the design project.

RIBA Research in Practice Guide
www.architecture.com/research

SCHOSA
Standing Conference of Heads of Schools of Architecture. http://www.schosa.org.uk

SCHOSA Research Review
www.architecture.com/research

Sharing Insights
Disseminating research. This can be done through a variety of media.

Soft Landings
Strategy to ensure the smooth transition form design delivery to occupation.

UK GBC
UK Green Building Council

Acknowledgements

List of Illustrations and Credits
Fig. 1
Architecture's Knowledge Loop

Fig. 2
Section through Chimney Pot Park Housing, Urban Splash & Shed KM

Fig. 3
Horsted Park, Masterplan, Proctor and Matthews Architects. Photo: Tim Crocker Photographer

Fig. 4
Horsted Park, Façade Detail, Proctor and Matthews Architects. Photo: Tim Crocker Photographer

Fig. 5
Horsted Park, House Façades, Proctor and Matthews Architects. Photo: Tim Crocker Photographer

Fig. 6
Example of benchmarking space in the home, Levitt Bernstein

Fig. 7
Easi-guide to Good Housing, Levitt Bernstein

Fig. 8
Peabody Housing, Bethnal Green London, Pitman Tozer

Fig. 9
Fireplace in existing housing, photographed by Sean Griffiths

Fig. 10
Street Party at New Islington Square, FAT

Fig. 11
Housing Layouts for Older People, Wright & Wright

RIBA