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inside



# ARCOM Newsletter

## Get in touch with us and contribute

For comments, ideas, articles, events, photographs, news in general, research experience, achievements, workshops, funny stories, serious stories ..

.. anything basically that you would like to share with other members, through this newsletter please contact the editor, **Dr Vian Ahmed**.

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Welcome to the **August** edition of the ARCOM newsletter. This issue arrives at a time close to the **ARCOM 19<sup>th</sup> conference**, held in Brighton between **3<sup>rd</sup> and 5<sup>th</sup> September 2003**.

The Chairman of ARCOM **Dr. David Greenwood** tells us more about this exciting event on the **front page**. We hope to meet you there. On behalf of ARCOM, I would like to congratulate the **Hycon** project team from Loughborough, Salford and Wolverhampton on their **EPSRC grant**, and thank them for sharing this with ARCOM (see **page 2**).

Our extended congratulations on **pages 3&4**, go to **Kevin Owen** and **Mark Shelbourn** for achieving their PhD. On **page 4**, in the Laugh and Learn column, **Dr. David Oloke** tells us how things went wrong when he prepared for his next conference. Thanks to David for sharing his story with us. *Have you had a similar experience?* If you would like to contribute to this column, I would be delighted to hear from you.

With his great enthusiasm, **Will Hughes** shares his valuable experience of 'writing a literature review' on **page 5**. This article continues from the previous issue (which you can find on our website [www.arcom.ac.uk](http://www.arcom.ac.uk)).

We are grateful to Will for his contribution and look forward to more of his research tips in future issues.

(Continued on page 2)

## ARCOM conference 2003

The Annual ARCOM conference and Annual General Meeting will take place this year between **Wednesday 3<sup>rd</sup> and Friday 5<sup>th</sup> September 2003** in Brighton, UK and will be hosted there by the School of the Environment at the University of Brighton. The new city-by-the-sea of Brighton and Hove is well known for its culture, lively art and music scene, historic architecture, coastal setting and diverse shopping and entertainment. The narrow lanes, surviving from the medieval fishing village of Brighthelmstone, contrast with the opulence of the Royal Pavilion and the sea-front Regency crescents and terraces.



ARCOM committee at their meeting at their quarterly meeting held at the University of Wolverhampton in June 2003

To quote from the city's tourist guide: *'With its cosmopolitan air, oodles of restaurants, feverish nightlife and abundance of culture, the place defies comparison with anywhere else this side of the English Channel.'* Since Regency times the city has been regarded rather as a 'pleasure dome', and thus the capture of the ARCOM 19<sup>th</sup> Annual Conference can only add a welcome dimension to the city's aspirations to add a more serious side to its cultural persona. Last year over 100 delegates from the four corners of the world attended, presented,

listened, debated and enjoyed themselves over the three-day period hosted by Northumbria University at St. James' Park Football Ground in Newcastle, and we have every intention of repeating the success of that event. Newcastle, of course (in collaboration with nearby Gateshead) was in the UK news recently as the bookies' favourite, but ultimately disappointed candidate in a race to become the European City of Culture, 2008. These hopes were dashed when the judges inexplicably, and, some would say and ill-advisedly, chose Liverpool.

Was it a coincidence, however, that *both* cities had recently hosted an ARCOM conference? We like to think not. In view of which, who knows what the future holds for Brighton? Within the city, the **University of Brighton** is a major element in the cultural character of Brighton and Hove. It has 18,500 students enrolled on a wide range of courses and has one of the best graduate employment records in the UK. The School of the Environment at the University of Brighton encompasses three teaching divisions of Built Environment, Civil Engineering and Geography and offers over 20 undergraduate and postgraduate courses. The School of the Environment is pleased to host the **19<sup>th</sup> Annual ARCOM Conference** and looks forward to welcoming you to the bracing sea air and excitement of Brighton.

The conference is now in its 19<sup>th</sup> year, and goes from strength to strength. If you would like to attend the conference or have any questions about it or ARCOM conferences in general, please feel free to contact the ARCOM Chair; **Dr. David Greenwood**, at [david.greenwood@unn.ac.uk](mailto:david.greenwood@unn.ac.uk), or telephone: UK +44 (0) 191 227 4691.



ARCOM Chair: Dr David Greenwood



(Continued from page 1)  
 You may be aware that the International Journal of CIDAC is now called the **International Journal of AECT-IT**. This is a high profile journal and I am sure many of us will benefit from learning about its scope. Subscription details on **page 6**. We are delighted to inform you about our first ARCOM doctoral workshop in 2003. **Andrew Dainty** reports on the success of this event (**page 7**), which was held at Glasgow Caledonian University on 18<sup>th</sup> June, and chaired by **Charles Egbu**. I hope you will be able to join us for future workshops.  
**Dr. Lamine Mahdjoubi**, director of the VR centre at the University of Wolverhampton, describes the **EPSRC VirCon** project on **page 6** and shares the VirCon team experience for disseminating the project's preliminary results with the West Midlands Construction Best Practice Club.  
 As you all know, **research** is a major part of our work, and ARCOM is keen to extend its membership to share and exchange expertise within the research community. This issue of the newsletter, includes a copy of the membership form for new members to join ARCOM. Please pass on this form to your fellow researchers and academics.  
 Finally, I would like to thank all of those who contributed to the newsletter, including the University of Wolverhampton for partially sponsoring this edition and welcome any future sponsorships, contributions, feedback or comments from our valued readers and organisations.  
**Vian Ahmed**  
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## The HyCon Project

*Simulating the performance of concrete structures using virtual prototyping techniques with particular emphasis on standardisation and pre-assembly of components through the use of hybrid concrete*

Building and information management techniques have significantly improved over the years. The need to improve the construction process in line with these information management improvements can therefore not be over emphasised. Traditionally, the industry has focussed solely on the functional (technical) performance of buildings, aesthetic values, time and cost requirements. Designers have failed in most cases to address the construction and fabrication problems and their implications for meeting clients' requirements. This has led to many problems in terms of litigation, extra cost and prolonged project duration. Although there has been significant research activity into buildability/ constructibility, the underlying construction process has rarely been challenged. It is essential to use a component-based approach to construction, as is the case with the manufacturing sector.  
 The implementation of hybrid concrete construction (HCC) is a component-based technique, which has been identified as offering several alternatives to the client, consultant and contractor. In the UK, the use of HCC technology is still in its infancy and therefore there is a need to promote its use for a wider take-up by the industry. The technology itself is not new, but it is new to

its potential adopters. **HyCon** is an EPSRC-funded collaborative research project, which has five industrial partners and three academic partners (University of Loughborough, University of Salford and the University of Wolverhampton). The project specifically aims to simulate the performance of concrete structures using virtual prototyping techniques with particular emphasis on standardisation and pre-assembly of components through the use of hybrid concrete. In achieving this aim, the following objectives are also being realised:

- 1 development of a methodology to assess performance of in-situ and hybrid concrete based on criteria like speed, whole life costing, and other 'added value' criteria
- 2 creation of a VR simulator to assist design decisions (in-situ vs. hybrid)
- 3 identification of technology transfer issues from culture and human resources aspects, and
- 4 testing and simulation of the model alongside a live project.



Members of the HyCon Academic Team



## Highest attendance for an ARCOM workshop!

The first ARCOM doctoral workshop of 2003 was held at **Glasgow Caledonian University** on 18 June 2003. The event attracted the highest attendance yet for an ARCOM workshop, with six doctoral candidates presenting their work to an audience of almost 40 PhD students and leading academics from many universities.



ARCOM Workshop June 2003 at Glasgow Caledonian University

The theme for the workshop was "*Managing innovation & knowledge management in the construction industry*".

Professor **Charles Egbu**, the ARCOM membership secretary and leading researcher in the fields of knowledge management and construction innovation, chaired the workshop. The research theme attracted an eclectic mix of papers from researchers at various stages of their doctoral studies. Papers were presented by **Micah Vines** (Glasgow Caledonian), **Chung-Chin Kao** (Reading), **Zhen Chen** (Hong Kong Polytechnic University), **Lawrence Mckay** (Loughborough), **Subashini Hari** (Glasgow Caledonian) and **Cong Huang** (Reading). The broad range of projects showcased at the workshop included work exploring: the KM implications of e-business; knowledge transfer in the briefing process; integrated approaches to environmental management; the effects of standardisation on

health and safety; knowledge management in SMEs and the development of a model for integrating IT innovations within construction organisations. The summary papers have been mounted on the ARCOM website. The lively discussion that followed each paper underscored the interest in knowledge management research, which has become a hot topic in recent years. Recurring discussion themes included the relationship between KM/ innovation and organisational performance, the factors influencing effective KM and the problems of researching the 'softer' social aspects of KM and other processes within the time and resource constraints of the three-year PhD period.

However, the discussion was not restricted to the technical content of the papers, but extended to issues surrounding the selection of appropriate methodologies and analytical techniques. Charles Egbu provided an expert summary of the issues emerging from the workshop and provided the delegates with plenty of food for thought concerning the role of innovation and KM in developing the industry of the future. He articulated the complex, context-bound nature of innovation and the many theoretical KM perspectives which can shape research in the area.

ARCOM are keen to run similar events in the future and would welcome suggestions from members interested in hosting an event. Please contact the workshop convener, Andy Dainty ([a.r.j.dainty@lboro.ac.uk](mailto:a.r.j.dainty@lboro.ac.uk)) with your suggestions for themes, venues and chairs. ARCOM are able to provide support in setting up the event, a financial contribution to cover for refreshments and will also provide a limited number of travel bursaries to PhD students who would otherwise be unable to attend. We look forward to hearing your ideas!



Workshops



David Boyd & Charles Egbu at the ARCOM workshop

*Note: The proceedings from the ARCOM Workshop held in Glasgow Caledonian University can be downloaded / obtained from the ARCOM website under "WORKSHOP"*



Andy Dainty ARCOM Doctoral Workshop convener



The **International Journal of IT in Architecture, Engineering and Construction (IT-AEC)** is a peer reviewed journal published quarterly in both print and electronic format by Millpress Science.

The journal publishes both original research papers as well as practice-related papers on any aspect of IT application in the fields of architecture, engineering and construction.



Editor:  
Professor **Chimay Anumba:**  
Loughborough University, UK

## International Journal of IT-AEC

The scope of the journal is wide and includes the following and related topics:

- Computer-aided design
- Computer-integrated construction
- Concurrent engineering in construction
- Computer integration of design activities
- Computer-aided cost planning and control
- Computer-aided construction process planning and scheduling
- Information management
- Intelligent systems
- Organizational/human aspects of IT in AEC
- Lifecycle design of facilities
- Computer-integrated facilities management
- Computer-aided construction site layout design
- Computer-aided construction safety management
- Communication issues
- Product and process modeling
- Knowledge Management

The journal is essential reading for academics, design engineers, construction managers, planners, architects, building services engineers, researchers, client organizations, professional bodies, trade associations, government bodies, IT specialists etc.

Further details regarding IT-AEC can be found on the Journal website:

[www.lboro.ac.uk/it-aec/](http://www.lboro.ac.uk/it-aec/) or by contacting the publishers at [info@millpress.com](mailto:info@millpress.com) or via their website: [www.millpress.com](http://www.millpress.com).

## VirCon – the virtual construction site project

Dissemination of Preliminary Results of The Virtual Construction Project (**VirCon**) to the West Midlands Construction Best Practice Club



Hosted by **Dr. Lamine Mahdjoubi**, the group photo is of members of the West Midlands Construction Best Practice club at the VR enterprise centre at the University of Wolverhampton

The **VIRCON** project is an **EPSRC** funded collaborative research project between four UK universities (Teesside, UCL, UMIST, and Wolverhampton) and several industrial collaborators, including **AMEC, Balfour Beatty, Carillion, Stent** and **Skanska**. Its aim is to develop CAD-linked analytic tools for the strategic planning of construction projects, which will allow planners to trade off the temporal sequencing of tasks with their spatial distribution. Started in June 2000, the project is now near completion and has delivered a suite of integrated software tools to assist construction planners.

**Dr. Lamine Mahdjoubi**, the director of the **Virtual Reality Enterprise Centre** at the University of Wolverhampton organised a presentation in January 2003 at the West Midlands Construction Best Practice club, to disseminate the preliminary results of the VIRCON project. Positive feedback was received from the participants to the event about the new methodology for space planning termed 'Critical Space Analysis' which runs parallel to the widely used Critical Path Analysis method of planning. In particular, encouraging remarks were received about 4D visualisation tools; which consist of interactive real time virtual reality based 4D simulators that allow planners and site managers to visualise construction projects and identify spatially congested areas, prior to the commencement of construction operations.



## Congratulations to Kevin Owen

This thesis concerns the identification of critical aspects involved in the successful procurement of privately financed tolled transportation infrastructure projects in the UK.

The aims of the research are:

- To identify through a triangulated research methodology those factors considered as of critical importance to the successful procurement of privately financed tolled transportation infrastructure projects in the UK.
- To establish a ranked order and weighting applicable to factors identified.
- To determine whether specific factors identified as critical can be classified as either Failure Reduction Criteria (FRCs) or Critical Success Factors (CSFs).

The findings indicate that in practice there are certain factors that are more important

in achieving success and/or reducing the likelihood of failure in the procurement of privately financed tolled transportation infrastructure in the UK. Furthermore, a distinction between FRCs and CSFs has been established from participants involved in this style of procurement, and the research identifies fourteen FRCs and four CSFs involved in this style of procurement.

The triangulated approach to the research has led to significant confidence in identifying factors of importance as they have been identified from three independent data sources. Factors have also been ranked.

The findings of this research may offer valuable information to both public and private organisations in their pursuit to successfully procure privately financed projects.

**Thesis**  
"Success Factors in the Procurement of Privately Financed Tolled Transportation Infrastructure Projects in the UK"

**Kevin Owen**  
The Nottingham Trent University  
Jan, 2003



## Laugh (and Learn) Preparing for your next Conference?

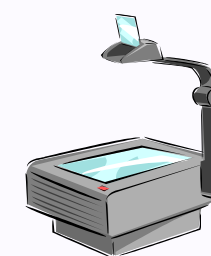
It was our first day at the 3<sup>rd</sup> Decision Making in Urban and Civil Engineering International Conference, London 2002.

The opening session had just been concluded and the conference had been split into the various presentation groups after a short coffee break.

My group was to return to the same lecture theatre the opening session had just ended. However, unknown to the chairman of our group session and every other delegate in our group, someone had switched off the presentation PC just before the coffee break. On returning and discovering this, the computer was switched on only for the usual user name and password request to pop-up as the PC powered up. The chairman immediately sent for the technician and also solicited for any help from the audience.

One by one some delegates began to try their skills at 'guessing' lecture-room-type PC passwords - all to no avail. In his magnanimity and in order to save time, the chairman

requested that anyone who had their presentations prepared for the OHP should identify themselves in order to start off the group session prior to the arrival of the technician.



This was effective, as speaker number four of five was prepared with 'all media' of his presentation (my lesson number 1 for the day; always carry along as many presentation media as possible).

Hence, he was called up to make the first presentation using the OHP. He finished and was rounding up the answer to his last question when the technician emerged to the delight of all. When shown the PC, the technician simply pressed the 'Esc' (Escape) button and informed us all that the PC had no password! (That was my lesson number 2; PC password requests could be deceptive!).

I hope these lessons will be useful to you as you head on to your next conference.

*If you are preparing for your next conference, you may want to take a hint (or two) from two lessons I learnt not to long ago.*

**Laugh (and Learn):**  
advice on preparing for presentations

*Sometimes all it takes is to press the ESC key!!*

**David Oloke**  
University of Wolverhampton



## Congratulations to Mark Shelbourn

The need for learning and training to be a life long task is becoming more popular, which means that people may need to be retrained or acquire new skills during their working careers. This creates issues as to which teaching methods are the most appropriate for each individual with differing ranges of experience and learning styles. The inclusion of information technology in curricula for teaching and learning could be a solution to some of these issues.

In building surveying, the need for continuous learning is evidenced by Continuous Professional Development (CPD) requirements of many of the UK professional institutions. The use of Computer-Aided-Learning (CAL) may provide a solution to formulating material that is more in tune with an individual learners needs, through the use of interactive computer programs.

The use of CAL in higher education has seen a growth in activity over the last few years through an increasing number of initiatives. Unfortunately few of these initiatives introduced a strategic approach, which is aimed at the needs and styles of users within the building-surveying domain.

Against this background, this research:

- ◆ Reviewed literature outlining the preferred learning theories that are relevant to learning in the building-surveying domain.
- ◆ Reviewed literature of the role of CAL in higher education, techniques and materials used to build a building, and the techniques and practices of surveying buildings, and the prognosis of defects found as a result of these surveys.
- ◆ Identified a set of user requirements through interviews with industrial experts, leading academics and students learning building pathology.

As a result of the above, the research has:

- ◆ Developed an understanding of the learning process and derived measures of effective learning according to the cognitive, experiential and behavioural learning theories, and the different styles of CAL.
- ◆ Shown how training a surveyor to survey a building has been a problem over the last ten years in higher education.
- ◆ Proposed an architecture for the development of a CAL building pathology application to resolve the problems of training.
- ◆ Developed a prototype CAL building pathology application to demonstrate the effectiveness of CAL in the building-surveying domain.
- ◆ Tested the prototype application with surveyors with a varied degree of experience and students to evaluate the effectiveness of the CAL building pathology application.

The thesis concluded that the development of a prototype CAL tool to aid in the training of inexperienced surveyors could make a distinct difference in their training. These tools are effective methods to support teaching within the building surveying domain, when strategically developed and implemented to target the educational needs and learning styles of its users.

### Thesis

"Using Computer-Aided Learning to train inexperienced surveyors in diagnosing defects in buildings"

**Mark Shelbourn**  
The University of Salford  
2002



## Research Tips: Part 2 – Writing a literature review

One of the most useful books on constructing a scientific argument is by Latour (1987). Latour explains, using copious examples, how to structure an argument. Of particular interest is the way that you can marshal an army of people behind you to help defend your position. One of the purposes of the traditional approach to scientific writing is to enable you to defend what you have done. If someone wishes to attack your data, you want to be able to stand aside and point at examples of others who have successfully published in respected journals using the same approach to data collection. For an attack on these grounds to be successful, your detractor needs to show that all those you have emulated were wrong. But you are not being attacked: they are. Perhaps they were wrong, but for that to be true, the referees who reviewed the papers before they were published must also be wrong, and so must the editors. This, too, is possible, but if the work was funded, then the reviewers of the research proposal and the funding committee who took the decision to fund it must also have made a mistake. This line of attack quickly becomes untenable if you have marshalled good resources. With an army like that behind you every step of the way, you are much more likely to be able to rebuff an attack, if you have been careful in following their examples. The same holds true for all the methods that you use.

Another useful tactic is for you to decide who the leader of the field is. Who has written most extensively on this topic? Make a short-list of the two or three people upon whose work you are going to depend the most. This list may change as you proceed with the research, but at any one point, you should be able to state the three most important papers in your research. Similarly, you should aim to have a clear idea about which is the most important journal for your work. And which is the most appropriate journal for your work to be published in when you have your findings? The answers to these questions will help you to be clear about the kind of approach that you are taking in your research.



In writing up the literature review, think about questions that arise from your readings. Structure your writing to reveal gaps in knowledge or weaknesses of previous work. Conclude the literature review with the need for your study, and then review methodological problems. There may be two or even three contextualizing chapters in your work, especially if you involved with inter-disciplinary research. One of these chapters, or a main section of the literature

chapter, should cover literature on research methods. Show how different methods are appropriate to different types of question and how various authors have used different methods on questions similar to yours (although not necessarily questions based in the construction sector). Select your research method to suit the question – a good book on research methods will help with this. And don't worry if you have already gone ahead with a research question and done your field work – simply select a question that suits your methods! The thesis is not intended to be a journal of everything that you did, and is not intended to trace every twist and turn of your thinking during the study. By all means, keep such a journal if you wish. But do not structure the thesis along those lines. The thesis should be a self-contained, internally consistent and persuasive document.

If you pay attention to structuring your contextualizing chapters, then the structure of the conclusions, limitations and recommendations will be that much easier. And remember, if you have read and understood the work of the few people at the forefront of research in a particular topic, then, in terms of your understanding of the issues, you are at the forefront too!

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**Writing a literature review:**  
advice for  
research students

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