CSD Research illuminates three Centuries of Construction Business Innovation

Introduction

By the very nature of its raison-d’être, CSD constantly benefits from the innovative thinking and activities of its academic membership in pursuance of its world-class research. This is evidenced in the products of CSD endeavour that frequently benefit its collaborating industrial partners and, that are constantly reported throughout academic literature.

But how innovative is UK construction as an industrial sector? Indeed, how innovative has it been over the last three-hundred years or so; and from what parts of the sector do its innovative commodities tend to emanate? These issues have recently been researched by CSD’s professor Holt who combined his academic expertise from within both the business and construction disciplines, to pursue an historical study of construction business evolution over the last three centuries[1].

The historical picture

The historical picture determined from his study is one of a fragmented and highly competitive sector throughout the period, characterised by businesses that have evolved predominantly in a ‘reactive’ fashion. This reactionary evolution has been almost exclusively in response to ‘outside-in’ influences, such as unpredictable macroeconomic conditions, shifting market demands, growing regulatory controls and the advance of capitalist speculation. These, combined with socioeconomic transition from a mainly domestic, agricultural society to that of an industrialised one, was influenced heavily of late by technological advancements and globalisation.

Consequently, albeit innovation is an oft-cited business ideal among contemporary construction companies, the historical construction environment has certainly not been conducive to widespread proactive innovation as a business strategy among contractor organisations. Hence, reactionary evolution has prevailed, which according to professor Holt has been manifest mainly in businesses at the vanguard of construction production. That is, formerly smaller firms – and since the 19th century – more specialised contractors in contrast to for instance, manufacturers, producers and suppliers further down the supply chain. The latter (maybe somewhat paradoxically) therefore, have been the greatest source of construction sector-specific business innovation exemplars.
An exemplar of construction supply-chain innovation

The original equipment manufacturer (OEM) J.C. Bamford (JCB), provides an example, of exemplar construction sector supply chain OEM innovation. By attaching a front loading shovel and rear-mounted backhoe to a ‘standard’ Fordson Major agricultural tractor in 1952, the ubiquitous JCB was born. The rest is history, and it is this kind of innovation that turned Joseph Bamford’s one-man business building agricultural trailers from war surplus in 1946; into a multi-national organisation with 22 plants on four continents and in excess of 750 dealers around the world today[2].

In the present context, these innovative advances in mechanical plant not only drove exponential product sales for the company, but also brought significant change to the construction sector. In this instance, by replacing mass labour with mechanisation—concomitant increased productivity, sustained levels of output and resulting economic savings.

So what of the future?

The construction sector has witnessed significant changes over the last three-hundred years; but its present-day characteristics remain similar to its history: a business environment recognised for turbulence, unpredictability and hyper-competition[3].

So what does this mean for the sector’s future and to what extent can history inform that question? Some think history cannot, but the alternative view reminds us that many still draw upon history when attempting to make predictions[4]. The conclusion of this study therefore, is that history can indeed help inform construction’s future. After all, much of what is considered new in the industry has historical antecedents, and so – as Diekmann[5] earlier pointed out – is not new at all.

Professor Holt suggests that at macro-level, most construction businesses will continue to navigate by their operating environment – in ‘reaction’ to the kinds of exogenous factors mentioned above. Innovation as a distinct business strategy meanwhile, will remain an impracticable aspiration for the majority; otherwise preoccupied with reactionary operational demands prerequisite to business survival. Innovation as an intentional strategic concept therefore, will be distinctively associated with larger and more profitable construction organisations.

In addition to the kinds of historical business challenges mentioned, contemporary construction strategic planning, has also to increasingly consider business continuity management. Potential threats of terrorism, medical pandemics and adverse acts of nature for instance, are seemingly ever-near to home and increasing in frequency. On the ‘upside’ however, these also provide future opportunities for innovative solutions; but, unfortunately for construction organisations at the vanguard of construction production, it is suggested the downstream supply chain will continue to seize upon these opportunities, while the majority of contractors remain constrained and pseudo ‘reactionary’.

That is, construction businesses’ reactionary response to exogenous influences will endure and at sector level, take precedence over endogenous innovative business strategy per-se.

References


Further reading

POST REF UPDATE: CSD PROFESSORS PUBLISH FIRST EMPIRICAL RESULTS OF CONSTRUCTION ACADEMICS’ VIEWS ON RESEARCH IMPACT

The Research Excellence Framework (REF) 2014 changed significantly from its former RAE-2008 assessment methodology, particularly, by including ‘research impact’ as a formal assessment criterion.

The REF defined research impact as that which had: “...an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia”.

Impact may include things like induced change or benefit as a result of academic research; to opportunity, performance, policy, practice or process – either of a community, constituency, organisation or individuals – in any geographic location. Of note however, impact does not intrinsically include any effect(s) upon Higher Education Institution activities, unless its reach goes significantly beyond that of the (REF) submitting institution.

For REF-2014, evidence of impact was presented via practical case studies – that had to clearly offer tangible evidence to support any such claims. The corollary of this is that academics now have to rethink – at least, regarding some of their research activity – so that they can demonstrate impact in their work for future REF returns. All such claims must transcend the boundaries of ‘pure’, or ‘basic’ research, so this may be something that we as research-active academics should be noting over the next few years if we want to be included in our university’s REF-2020 submission.

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Academic disposition towards impact shows an apparent dichotomy among the literature at the moment. Some feel that impact is necessary in order for government to achieve value-for-money in ‘return’ for its investment in academic research; and that impact is the only way that research can make real change. Others however, suggest that growing emphasis on impact is bringing detrimental effects: for instance, on pure or basic research endeavour; on ‘blue-skies’ research; and even on academic freedom. So what are the effects of all this on university research and research-active academics? And how might this affect our academic research in the future?

In order to help answer such questions, CSD Professors Holt, Goulding and Akintoye have recently undertaken research into these issues. Their latest publication on this subject identifies an element of ambivalence among construction management academics; but, they propose, this might be due to a level of ‘uncertainty’ surrounding impact and the REF (as their empirical work was undertaken early 2014). Findings to date suggest that post REF-2014, academics will have learned much more about impact; about what it means to the REF; and about how it might affect them and their work more directly. More importantly perhaps, given impact’s increasing prominence among ‘assessment’ of research validity, they suggest this will: “…focus minds and resultantly, we expect perceptions of impact to become more clearly delineated among the ‘for’ and ‘against’ camps”.

Other outcomes of this research included a high self-reported awareness among academics of theory and impact as separate entities; but a much greater variance in the perceptions of how these concepts interrelated with each other. The professors found ‘broad’ acceptance of the role of impact relating to the assessment of government funded research grants, but much less acceptance of impact in relation to the REF. Those surveyed were undecided as to whether increasing emphasis on impact in the future will be a good thing for theory generation; although there was slightly better agreement that impact was beneficial for the construction management discipline.

While this aspect of their study utilised a principally ‘statistical’ approach, more recent additional analysis of qualitative data from the empirical research is currently being undertaken, as a means to broaden the findings further. Preliminary findings from this to date have found the principal impact enablers to be ‘Facilitation’ (mainly industry engagement and time); while principal constraints include ‘Internal Factors’ (the academic’s disposition to impact and that of the university), along with ‘External Factors’ such as collaboration and funding. In contrast to impact-oriented research, analysis is suggesting that academics view ‘Resources’ (competence, time, funding) as the principal enablers of theory-driven research; while its corresponding challenges include ‘External Factors’ – mainly market forces and compliance with evolving research ‘protocol’.

The professors’ work places CSD at the vanguard of empirical research impact study – an area of our academic roles that looks set to gain increasing prominence between now and REF2020. And potentially, an area that will affect us all in one way or another henceforth.
EVENTS AND PUBLIC PROFILE

UCLan Distinguished Visitor Programme

The Distinguished Visitor Programme (DVP) provides funds to enable high profile visitors to make a short, targeted visit to UCLan.

The aim is to promote world-leading research collaborations (both new and existing) across research and innovation, and help raise the profile of the excellent research and innovation activities that UCLan currently undertakes.

CSD has been very successful in applying for funding from the DVP. Prominent internationally renowned academics are continuing to strengthen and support CSD, especially as impact and engagement is an important part of sharing the sustainability theme. We look forward to hosting similar high-profile visitors in the future.

-Professor John Tookey

In March, 2015, CSD will proudly host Professor John Tookey on a visit to UCLan as part of the Distinguished Visitor Programme. Professor Tookey is the Head of the Built Environment Engineering Department in the School of Engineering at AUT University (New Zealand).

Professor Tookey graduated from the University of Bradford (UK) in 1993 with a BSc Technology and Management Science. He subsequently returned to university to study for his PhD, which was awarded in 1998 for his thesis entitled "Concurrent Engineering in the Aerospace Industry: A comparative study of the US and UK". From 1998 to 2006 Professor Tookey worked in Glasgow Caledonian University as first a researcher then as a lecturer. In 2006 he moved to the University of Auckland and then moved to AUT in 2009. During his time with each of these institutions he developed new programmes at both undergraduate and postgraduate levels. To date he has managed a total of five masters degree programmes, and established a total of three postgraduate and two undergraduate programmes.

Professor Tookey has an extensive record of publication and research in the construction industry, as well as engagement with industry. Currently he has published close to 100 works, as well as having graduated over 10 PhD students. His research is primarily industry centric with extensive work related to housing and construction costs as well as waste reduction, waste minimization and supply chain / logistics management in construction etc. In addition to a wide range of publications Professor Tookey has regularly developed and presented training and professional development courses for a number of construction organisations in both the UK and NZ as well as NZ Institute of Management (NZIM), Fonterra and IPENZ.

-Professor Ashraf Salama

Dr. Ashraf M. Salama is a professor of Architecture and head of the Department of Architecture at the University of Strathclyde, Glasgow. He was the founding chair of the department of architecture and urban planning. Earlier he was a reader in architecture at Queen’s University Belfast.

He is a fellow of the UK’s Higher Education Academy-FHEA and the Royal Society of the Arts-FRSA. His areas of expertise include architectural and urban education, social and cultural factors in arch-urban design, evaluation of designed environments, and design briefing and strategic facility planning. His current research focuses on urban transformations in the cities on the Arabian Peninsula. He has published extensively with over 150 research outputs and publications. He has also authored and co-edited 9 books, and is a board member of several international journal and organisations.

As part of their visit, Professor Tookey and Professor Salama will be delivering a joint Public Lecture on Wednesday 25th from 4.30-6.30pm in FBLT4 at UCLan.

Professor Tookey’s presentation is titled: “BIM: The Agony and the Ecstasy of a Panacea”

Professor Salama’s presentation is titled: “Researching the Global South: Contemporary Research Trends in Architecture and Urbanism”

To book a place at the joint event, please register at: http://bit.ly/1E8Wd85

For further information contact Dr Steven Ruddock on sruddock1@uclan.ac.uk
TWO NEW MEMBERS TO CSD

We are pleased to welcome two new members to CSD. In 2014, Dr Ehab Kamel and Dr Andrew Fsadni formally joined CSD. They gave an inaugural presentation at CSD’s Research Seminar in November 2014.

The following section provides a brief biography of our two new members:

Dr Ehab Kamel, BSc is a lecturer and researcher in Architecture and subject leader of Building Technology, with over fifteen years of experience in both academia and practice.

Just after finishing his PhD from The University of Nottingham, UK, in 2011, Ehab moved to China to establish the University of Nottingham’s Architecture programme at its overseas campus in Ningbo, China, where he spent three years before he joined UCLAN in June 2014.

Ehab is a registered architect (in Egypt) and urban designer; since 1998, he has worked on many urban and architectural design projects in the Middle East, North Africa, Asia, and Europe, leading design teams through several projects and winning architectural and urban design competitions.

Ehab's research concerned the interpretation management for architectural engagement with, and sustainable development of, cultural heritage sites. His writings investigated Liverpool World Heritage Site (UK), Historic Cairo (Egypt), and The Imperial Street in Hangzhou (China), as well as criticising ICOMOS charters and UNESCO’s criteria for World Heritage Sites’ listing of cultural sites. Currently, Ehab is researching the relation between building-skins, city cultures, and users’ wellbeing, which investigates how design for culturally rich sites learn from the past to create sustainable environments.

Dr Andrew Fsadni is a lecturer and researcher in Building Services. Andrew joined the University of Central Lancashire in 2012 after completing his research work at Brunel University.

At Brunel he worked on an EPSRC Industrial CASE project which was developed in collaboration with Spirotech bv, of the Netherlands. He successfully defended his PhD in 2012. As part of this project Andrew developed a number of mathematical models to predict the characteristics of two-phase flow in wet sealed heating systems. This work is instrumental in ensuring the optimisation of heating system efficiencies.

Andrew’s principal research interest is in Thermo-fluids engineering, more specifically the investigation of multiphase flows, associated heat transfer coefficients and the use of nanofluids for enhanced heat transfer. His research interests also include the investigation of indoor air quality, ventilation and zero energy buildings. Andrew is currently developing a number of research grant proposals based on these areas of study.

As part of his responsibilities at UCLan, Andrew leads and delivers a number of modules at undergraduate and postgraduate levels, with a core specialisation in Building Services and Sustainable Engineering. He also supervises students at undergraduate and postgraduate levels during the course of their dissertation projects.

We are looking forward to working alongside Ehab and Andrew on future research initiatives.

Visit from Down Under...

September, 2014, saw the visit of Bo Xiong (pictured with Prof Jack Goulding and Prof Akin Akintoye) from QUT Australia. The purpose of Bo’s visit to the Centre of Sustainable Development was to investigate the decision-making process on sustainable requirements when clients develop buildings intended for educational purposes. Additionally, he was interested to test whether higher sustainable requirements significantly lead to higher capital cost and whether such increased cost can be paid off by taking consideration of energy saved and other potential benefits.

Bo Xiong has been a PhD student enrolled in Queensland University of Technology in Australia since February 2013, after he finished his bachelor degree and master by research program in Chongqing University (China). Bo has been working on a research project related to cost modeling of education buildings funded by the Department of Education in Australia and his research interests also covers organizational management strategies and sustainability considerations in achieving better modelling results.
GBACE has been named as educational partner on two new Heritage Lottery Funded (HLF) projects: this follows the trend of recent years and adds to the impressive list of schemes with which the School's MSc in Building Conservation & Regeneration has been involved.

The first of these projects is in partnership with the Clitheroe Civic Society. The Society is spearheading an urgent project to see the historic Palace of Westminster pinnacle repaired and, on completion, to provide a full interpretation of this iconic monument sited in the grounds of the Borough’s War Memorial Gardens at Clitheroe Castle. UCLan’s involvement in the scheme has included student interpretation of the site’s significance and a 3D laser survey of the monument is soon to be carried out.

In contrast, Bacup Townscape Heritage Initiative (THI) involves the regeneration of Bacup’s Conservation Area, which is situated in the commercial heart of the town. HLF funding has been granted to target vacant and neglected heritage buildings, the aim being that the rejuvenation of these sites will help boost investment in the centre of Bacup. The project manager, Gareth Fort, is currently a student on the MSc Building Conservation & Regeneration course and has arranged a series of activities with the course leader, Chris O’Flaherty, including an upcoming full day workshop event where student will investigate the potential re-use of a grade II listed industrial building. Speaking about the project, Chris O’Flaherty emphasised the role real life schemes play in the delivery of the course:

"This is a fantastic opportunity for our students to get to grips with a HLF project and investigate the problems associated with finding sustainable new uses for redundant heritage buildings."

Web links for both projects are given below.

http://www.bacupthi.org.uk/
http://clitheroecivicsociety.webs.com/thepinnacleproject.htm

South Gloucestershire Project

Dr Andrew Smith and new CSD member Dr Andrew Fsadni have recently started working on a research project in collaboration with South Gloucestershire Council in their offices at Yate, near Bristol.

The focus of the project is to test the indoor air quality benefits of introducing living indoor plants to their offices. Plants have been provided by Urban Planters for an experimental area for comparison against non-planted control areas of similar scale, design and function. The council have a requirement to increase the indoor relative humidity %RH within their offices, which has so far not been possible by mechanical means. Previous IAQ sampling has given results outside the human comfort range of 40-60% RH as recommended by CIBSE.

The aim of the trial is to understand, through the implementation of plants into the trial area, whether there is a measurable %RH increase that can be maintained within the human comfort zone. Previous research in Edinburgh (Smith & Pitt, 2011) has suggested that this is possible through the implementation of plants and the current trial will help to validate the results.

CSD SEMINAR SERIES

In November, we continued our series of research seminars. This event saw a series of presentations covering a range of themes such as Graffiti in Devon (Adam Evans), Re-imaging Outdoor Sports (Dr Mark Hickman) and Asbestos Regulations (Dr Godfaurd John) to name a few. Guest speakers, Martin Brown (Lancashire Best Practice Club), and Professor Jason Underwood, (University of Salford), were invited to present. Other speakers included Dr Mark Hickman (Institute of Coaching and Performance), and Gloria Ene (CSD PhD Student). The presentations were well received. The next seminar in the CSD Research Seminar Series will be in July.
UCLan GBACE ‘BENEFIT’ from Horizon 2020 funding

Dr Champika Liyanage and Professor Akin Akintoye from the School of Grenfell-Baines Architecture Construction and Environment, have been triumphant in achieving funding for a Horizon 2020 project on ‘Business models for enhancing funding and enabling financing for infrastructure in transport – BENEFIT’. The project is follow up from the 4-year EU COST project both Champika and Akin were involved in on ‘Public Private Partnerships in Transport – Trends and Theory’.

The project is led by University of Aegean, Greece. UCLan will be the task leader in investigating limitations in funding and financial regimes for PPP transport infrastructure and in examining the solutions to mitigate the limitations and identifying best practice for funding and financing infrastructure in transport.

Altogether 14 partners across Europe are involved in this project. The project is worth €1.6 Million and the total duration of the project is 21 months. The 1st Consortium meeting of the BENEFIT project was held in University of Aegean, Chios on the 1st to 4th of Feb 2015. The members of the consultation group of the project also got involved during this meeting via a live streaming session (https://plus.google.com/u/0/events/cegudar2t0f37e8rid3e8tk5oog).

For more information on the project, please visit http://www.benefit4transport.eu/.

CSD Members secure ‘major’ international research grant funding

Professor Karim Hadjri and Professor Akin Akintoye will lead an international project to find new ways of helping older people remain in their own homes using smart technology to aid independence, care delivery and better connect them to their communities.

The three-year £1 million ESRC funded venture will work with people who are over the traditional retirement age of 65, with a particular focus on the over 80s, to find new and innovative ways of adapting a person’s home so that they can live independently for longer and avoid going into residential care as well as making it easier for them to access public services such as health and social services.

The project will explore the relationships between a person’s living environment and the design of care delivery. This will involve working with older volunteers to, for example, explore smart technology such as sophisticated alarm systems that can monitor the opening and closing of doors, fall sensors, specialist lighting and talking devices to aid visual impairment, gadgets that monitor health information and even direct video links to a resident’s GP.

This aspect of the study will be supported by an assessment of the value and potential of relevant social support and relationship networks to older people, such as family and friends and informal social groups that bring people together. For this, the study will look at a number of local settings within each country and taking account of cultural values, consider the part that these networks can play in the design of care and accommodation delivery.

ODESSA (Optimising care delivery models to support ageing-in-place: towards autonomy, affordability and financial sustainability) is a collaborative venture between UCLan, Tsinghua University in Beijing, China, Université Paris Dauphine and Université Centre National de la Recherche Scientifique /Paris I-Panthéon Sorbonne from Paris, France.

A key focus is how China, which traditionally cares for its older population through extended family support, and the existing European care system can learn from each other while also acknowledging that both systems need to prepare for the challenges of an ageing population. By 2035 it is projected that those aged 65 and over in China, the UK and France will account for 20%, 23% and 24% of the total populations respectively, and the number of people aged 85 and over in the UK will be 1.6 times larger than in 2010, accounting for 3.6% of the total UK population.*

Professor Karim Hadjri is leading the project in the UK. He said: “This is a great opportunity for UCLan to lead on ageing research in collaboration with world class universities in France and China.”
CSD PUBLICATIONS (2014 - DATE)


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Newsletter Editorial Office

The CSD Newsletter provides a forum to champion the activities of CSD and its members while also serving as a conduit for communication of broader GBACE research activities. We welcome contributions for possible inclusion in future issues including: news items; events; announcements; comments; replies; and anything else of potential interest to our readership.

Please address all submissions or any other queries in the first instance to: Dr Steven Ruddock, Newsletter Editor.
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