

Innovations in Construction Material Reuse

LINKEDME Newsletter

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Increasing Circularity and Reuse in Fit-out Projects

Can Technology Provide and Answer?

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LINK Consortium

The Link Consortium brings together experts in building materials reuse consulting, latest artificial intelligence and object recognition technology to provide rapid listing software which could increase reuse of reclaimed construction materials and significantly reduce carbon emissions.

The LINK Consortium organized a workshop targeted at architects, engineers, construction product manufacturers and fit-out trade bodies to hear first-hand feedback on the challenges they faced in repurposing reclaimed interior design materials. This exercise was conducted to hear from key decision makers in the fit-out market and also introduce the cutting edge technology that could support circularity. When developing new technologies it is important to ensure potential users are put first at the earlier development stages of the technology rather than to consult with them once the technology is about to be launched into the market place.

The workshop had excellent attendance from a wide representation of supply chain in construction.

The workshop was chaired by Dr Mohammad Nazir OBE, Head of LINK Consortium and MD of Nazir Associates Ltd.



Speakers at the LINK workshop

Speakers included:

Dr Flavie Lowres
Sustainability Champion at FIS

Dr Katherine Adams
Technical Director at Reusefully

Rachel Hoolahan
Associate at ORMS

Professor Hafiz Alaka
Director at BigData Tech and Innovation Lab at Hertfordshire university

Speaker introductions:



Flavie Lowres, Sustainability Champion – Finishes and Interiors Sector (FIS)
Flavie Lowres has 20 years experience in the construction industry. She has spent most of her career working on sustainability related to the built environment with a particular focus on embodied carbon and circular economy. In particular, she was involved in the Building as Material Bank (BAMB) and the Circuit projects, both highly influential projects related to circular economy and have led to the creation of indicators. She is a Fellow of the Institute of Materials and Chair of the Construction Materials Group. In 2021, she joined the FIS to become their sustainability champion. As part of her role, she is supporting the Innovate UK funded LINK project.



Dr Katherine Adams, Technical Director – Reusefully
Katherine Adams has over 20 years' experience in sustainability, mostly in the construction sector. She completed her PhD at Loughborough University, looking at how a circular economy can be embedded in the building sector. She has undertaken projects on topics such as embodied carbon, waste management, circular economy, measurement and verification of a product, building and organisational level. Examples of current and recent work include a comprehensive guide on embodied carbon for social housing, interpretation of zero avoidable waste and participation on UKGBC's Whole Life Carbon Task Group for Domestic Retrofit and Materials. She also supports the Alliance for Sustainable Buildings Products (ASBP) as a Technical Director.



Rachel Hoolahan, Associate – ORMS
Rachel Hoolahan is an architect and sustainability co-ordinator at Orms with extensive experience working with existing buildings. For the past few years she has engaged in a series of deep research assignments and is utilising this data and knowledge to push the boundaries of sustainable development – both in refurbishment and new build projects. Recently, she led a research piece on material passports as part of a wider Cradle2Cradle Innovation Project into material reuse. The outcome of this work is a methodology for encouraging more meaningful material reuse, by creating a material database design teams of any size or skill set to apply the work to their projects.



Prof Hafiz Alaka, Director, Big Data Tech and Innovation Lab – University of Hertfordshire
Hafiz Alaka is a Professor and the founding Director of the Big Data Technologies and Innovation (BDTI) laboratory (for construction and infrastructure). The lab currently hosts 15 members of staff including postdoctoral research fellows, machine learning scientists, data warehouse analyst expert, general software developers. Hafiz favours cross-disciplinary collaborative research for solving real-life challenges. His focus areas is application of contemporary technologies (Big data, artificial intelligence/machine learning, etc.) to construction, infrastructure, business/finance, and agriculture, among others. He has used image recognition, supervised and unsupervised, and reinforcement learning among many other AI methods to proffer solutions to challenges in the aforementioned sectors. He has produced over 50 peer-reviewed articles, including over 20 articles published in journals of international standing. He currently has over 350 citations with H-index=27 and i10-index=37 on Google Scholar.










Increasing Circularity and Reuse in Fit-out Projects Can Technology Provide an Answer?

Reducing waste generated during the fit-out process from both the removal and installation of products/components is one of the key challenges the construction sector must address if we are to achieve net zero carbon emissions targets and a reduction in waste. Fit-outs are often carried out under strict time pressures, which frequently mean that opportunities to reuse or recycle materials are not taken, and which can lead to an which can lead to missed opportunities to reduce carbon emissions.

Tackling circularity in the fit-out sector could significantly reduce building material waste and reduce carbon emissions. FIS members (just under 600) welcome the efforts by the LINK Consortium to develop cutting edge technology to aid the speed at which fit-out materials can be placed into the construction material marketplaces and also the reduction in the cost of labour and contributing to a lower price of the reuse fit-out products.

IPCC | Climate Change 2023: Synthesis Report

More than a century of burning fossil fuels as well as unequal and unsustainable energy and land use have led to global warming of 1.1 °C above pre-industrial levels. This has resulted in more frequent and more intense extreme weather events that have caused increasingly dangerous impacts on nature and people in every region of the world. But there are multiple, feasible and effective options to reduce greenhouse gas emissions and adapt to human-caused climate change, and they are available now, said scientists in this IPCC report. Taking effective and equitable climate action will not only reduce losses and damages for nature and people, it will also provide wider benefits, the report points out, underscoring the urgency of taking more ambitious action now to secure a liveable sustainable future for all.



UN chief calls for accelerating climate action on all fronts

“Our world needs climate action on all fronts - everything, everywhere, all at once,” the UN Chief said in response to the IPCC’s synthesis report, calling on every country and every sector to massively fast-track efforts to tackle the climate crisis.

Key Highlights from the recent LINK workshop

Here are some of the key highlights you may have missed!

Katherine Adams of Reusefully provided a presentation on avoiding waste in the fit-out process. She described how pre-demolition and pre-refurbishment audits are used as one of the main tools to try to improve circularity in fit-outs, how they can be used to set targets for reuse, also the limitations of these in being fairly time intensive. She highlighted some key material streams that arise during fit-outs, including what could be done with glass partitions and facades (more to do in this area), plasterboard, insulation, plastics, carpets, and the pros and cons in each case.

Rachel Hoolahan of architectural practice Orms discussed how they approach each project as an opportunity to understand how they can bring down carbon impact (whether this is for refurbishments or new builds), and how reuse provides a major opportunity. They partnered with one of their clients, Grosvenor Estates, in developing the concept of a 'material passport' to help accelerate material reuse. This has involved understanding more about the barriers to material reuse, whether that be cost, risk or practical issues around deconstruction. A material passport provides a digital representation of a physical product and helps create an inventory of a building and its components that could be used for future reuse.

Dr Flavie Lowres of FIS-Circular Economy often focuses on new build. However, a building that is designed for 60 years will probably be refitted 10 times through its lifetime. The construction industry is a huge consumer of resources (50% of all resources extracted) and very wasteful (30% of all waste production). It is also often accounted for 50% of all Green House Gas emissions. So, there is much to do in that sector to reduce its impact and there is a need to move from a linear to a circular economy. Wastes are generated during construction phase, during a transition from Cat A to Cat B transition. A circular approach would include reducing waste by not creating them in the first place, but also by increasing the amount of products that can be reused in new projects, which will lead to a reduction in the carbon emissions of projects.

Prof Hafiz Alaka of Hertfordshire University BigData Lab- Artificial intelligence tries to mimic the problem-solving and decision-making of a human being using computers. In order to work, a large amount of labelled data need to be fed into the computers to train them to identify patterns and make predictions about future states. The focus of the LINK project is on image recognition, also known as image detection, identification and classification. Examples of Image recognition can help monitor construction equipment and ensure that it is used safely or for monitoring construction site in real-time. For the LINK project, image recognition will be used to recognise different elements of the building using a phone and its camera during pre-demolition audits.

Dr Mohammad Nazir OBE, who chaired the workshop, concluded "the vibrant discussions and poll results show a high level of interest from all stakeholders in the use to technology and standardisation of classifications of reuse products in the efforts to increase circularity in reuse of construction products to reduce carbon emissions.

Polls: Extremely Encouraging Feedback!

Level of involvement in reuse: Majority of respondents said they were exploring reuse concept.

What type of products?: raised access flooring, doors, joinery, ceiling system, floor covering.

Change in interest for reuse: 98% of respondents said they were encouraged about the reuse.

Collaboration with LINK: 100% wanted to collaborate with LINK opportunities.

Would you like to be a guest speaker at the next LINK workshop?

Contact LINK: hello@linkedme.co.uk

Embracing technology to aid circular economy in construction projects requires significant behavioural change at all levels.

Everyone knows that construction industry globally is the biggest contributor to the output of manufactured materials for the built environment and contributes the biggest waste in terms of materials through demolitions and building materials.

Construction sector contributes around 38% of the global carbon emissions (11% comes from the construction material manufacture and 27% from operational activities) In the UK 5 million tonnes of construction materials on average goes into landfill waste sites. This is a staggering amount of waste and carbon emissions that should be a major focal point for urgent support in the efforts to drive net zero carbon emission targets.

Many of the construction companies and construction material manufacturers are taking this matter very serious and have begun to develop and implement sustainability goals across their organizations. Some companies have gone further by appointing sustainability managers to drive their robust strategies to reduce carbon emissions at all levels of their supply chain.

LINK has engaged with several major construction companies to collaborate on the development and use of latest cutting-edge technology to boost circularity and reuse of construction materials in all sectors of the construction industry.



“Behavioural Change at all levels is important to make meaningful impact in reaching sustainability goals ”

Dr M Nazir OBE
Head of LINK Consortium

Willmot Dixon, Hills & Smiths Group and many others have been exploring the use of mobile app technology at the reclaimed product source to speed up the time it takes for excess building materials to be either removed from site or procured for use in building projects. Some companies have suggested an “ebay” type of platform for the construction reuse materials to be the answer for such B-to-B reuse material sales. However most construction companies see the time it takes to upload images, add details, input price details, add location of pick as time consuming and a big barrier to circularity.

They have welcomed a solution that with a few clicks and within seconds enables the placement of the reuse product onto a reuse product platform which has auto-management function for the whole pick-up, payment, delivery and sales process.

If you are a construction company wanting to be the first to use the LINKEDME technology register your interest here:

hello@linkedme.co.uk

LINK CONSORTIUM NEWS

LINK Consortium is proud to **announce** that **Dr Mohammad Nazir OBE**, who heads the LINK Consortium, has been appointed onto the Sustainability West Midlands Board.

Andrew Pollard, Chair of SWM, commented that, "Sustainability West Midlands has been doing tremendous work in the past decade in the capacity of leading advisory efforts to help develop policies, strategies and metrics to be used by the public and private sector to reach the regions sustainable development goals (SDG). SWM appointed 4 exceptionally talented new board members. SWM succeeded in their plans to diversify the board to reflect the West Midlands diverse community base without compromising on the expertise of the board to achieve its ambitious growth plans.

Nazir Associates Ltd and LINK are members of Sustainability West Midlands. www.sustainabilitywestmidlands.org.uk to join!

Subscribe to News and Events: WWW.LINKEDME.CO.UK



 Perminder Balu
 Lindsay Harris MAPM
 Dr Mohammad Nazir OBE
 Gbenga Oludotun

Who is Sustainability West Midlands (SWM) and What Do They Do?

SWM is the sustainability champion body for the West Midlands as designated by government. It is a not-for-profit company that works with their members in the business, public and voluntary sectors. Their role is to act as a catalyst for change through their advice to leaders, to develop practical solutions and share success through their communications channels.

SWM are the founders of Climate UK who provide a national good practice network of similar organisations.

Don't miss SWM Annual Conference, 13 July 2023 at the Black Country Museum: Register your place here:

<https://www.sustainabilitywestmidlands.org.uk/events/swm-annual-conference-2023-our-changing-west-midlands/>



For collaboration, news & events and workshops contact LINKEDME at hello@linkedme.co.uk



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University of Hertfordshire **UH**