Northumbria University NEWCASTLE

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Northumbria KTP addressing the challenges of the UK housing crisis is rated outstanding

A Knowledge Transfer Partnership (KTP) between Platinum Electrical Engineering and Northumbria University has received the highest possible rating by an independent assessor.

One of the outputs of the KTP is a new Building Additive Manufacturing (BAM) capability which 'prints' the complete structure of a building by autonomously depositing concrete layer by layer from the ground upwards.

The BAM capability reduces build cost and time, as well as making a significant contribution to net-zero by streamlining the supply chain, reducing construction materials transportation and waste to near net-zero. Cement usage is reduced by using alternative waste materials from steel and coal industries.

Now the partnership has been rated as “outstanding” by Innovate UK, the UK’s innovation agency. Knowledge Transfer Adviser, John Clayton, of the Knowledge Transfer Network, supported the KTP throughout and commented: "This was an extremely challenging and complex project. The impressive results, demonstrated by this Outstanding grade, were achieved through excellent collaboration among the company and university team, led by KTP Associate Laurence whose performance, insight and team-working was exemplary throughout the KTP."

Associate Laurence Foster, in collaboration with academics from Northumbria’s Faculty of Engineering and Environment and the Platinum project team, worked on-site at Platinum’s premises in Gateshead to take the project through a detailed two-year project plan involving discovery, technology development, prototyping, testing, and continual enhancements.

The Project focussed on the BAM potential for building affordable housing and involved creating bespoke additive manufacturing equipment and software. The aim was to create a prototype device capable of the in-situ manufacture of two-storey structures and eventually a row of terraced houses.

Deployment of the BAM equipment on a housing project will reduce build costs and times and deliver new homes more rapidly, addressing the UK’s housing crisis.

Platinum are continuing to develop the technology and collaborate with the university, headed by Associate Professor Phil Hackney, an expert in Rapid Manufacturing. The follow-on project, In-situ Building Advanced Construction (IBAC), also represents a major innovation for UK construction in its approach towards net-zero carbon by 2050.

Laurence and the team have already been in talks with several Councils, housing providers, and architechtural organisations to explore collaborative projects using the BAM technologies developed in the KTP.

Commenting on the KTP, Laurence said: “This project has opened my eyes to the huge potential benefits to industries and wider socio-economic implications through the development of newly emerging innovative systems. I’ve honed my CAD design, 3D printing and project management skills to enable realisation of the second known additive manufacture system in the UK capable of printing concrete.

"I believe this opportunes positive disruption for the construction industry and its traditional methodologies, through adoption of advanced automated manufacturing technologies. This provides new and alternative ways for structures to be built with safer practices and significantly reduced costs, emissions, wastage and timescales compared to existing industry norms.”

KTP Associates have a hybrid role, working at the company, with regular visits from Academic staff to supervise the project and discuss with the company team. Laurence was able to learn from his colleagues in Platinum, including his company supervisor Adam Viney, Electrical Control Engineer, and to collaborate with leading researchers in Northumbria’s Department of Mechanical and Construction Engineering on the investigation of deposition of cementatious materials.

Laurence is now employed by Platinum in a new role as Lead R&D Engineer, and continues to work on a range of projects, including the continuation from the KTP project.

Gateshead-based Platinum Electrical Engineering designs and manufactures bespoke electrical machinery, control systems, and equipment for clients in manufacturing, defence, aviation, and automation.

Their strategy is to exploit their unique engineering expertise working collaboratively with partners to develop innovative solutions for industry and societal challenges.

Their approach, led by Managing Director Stephen Maltby, of combining engineering expertise, market insights, IIOT, and partnership building underpinned the KTP. Stephen explained that BAM has enabled long term relationships and future projects, with interest from several academic establishments and industry collaborators already in play.

Knowledge Transfer Partnerships (KTPs) are an Innovate UK programme, designed to enable collaboration between academia and industry, facilitating the transfer of knowledge and technology to increase competitivity and to promote an innovation culture.

Northumbria has a long track record of successfully collaborating with small and large businesses on KTPs. Phil Hackney commented: 'KTPs are a great way for the university to build a long-term relationship with a company and for Academics to learn about their business-critical industrial challenges and create a route to high impact for their research.

"Our KTP with Platinum helped the company embed new knowledge in additive manufacturing and, in Laurence, they have a new, highly skilled motivated member of the team ready to take on the next project."

To find out more please vist Northumbria's Mechanical and Construction Engineering department page.

Find out more about KTPs at https://www.ktp-uk.org/

Find out more about Northumbria University KTP case studies.

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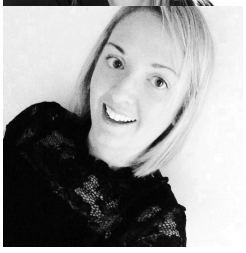

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