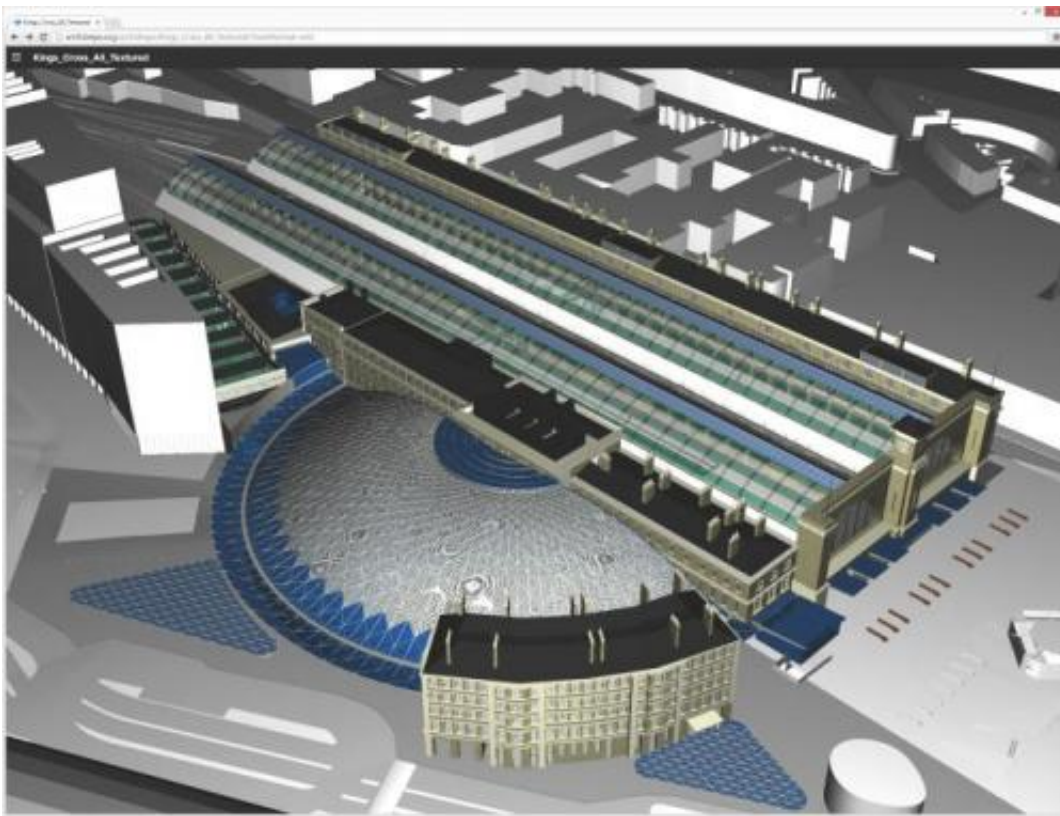# Talking in 3D: Discussing and administrating complex construction models via a web browser

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New software enables discussing and administrating complex construction models, like this one of London King's Cross station, via web browser. Credit: Kristian Sons/Saarland University

Redevelopment of the London King's Cross station and the nearby

neighborhood was announced in 2005 and completed with a grand opening in 2012. The internationally well-recognized engineering services firm Arup, famous among other things for their work on the Opera House in Sydney, Australia, and the Allianz Arena in Munich, worked on this 400 million pound construction project. In the process, the area to the north of the station including 50 new buildings, 2,000 new apartments, 20 new streets and ten new public squares was being renewed. Thus, a great challenge was to ensure that all project partners had consistent, up-to-date data that could be visualized.

"What has already been standardized for product data is not yet common for all 3D data, and therefore takes a lot of effort," explains Kristian Sons, who is doing his PhD at the faculty of Computer Graphics at Saarland University in Saarbruecken, and does research at the German Research Center for Artificial Intelligence (DFKI), only a few yards away. Some companies maintain Excel sheets manually or develop custom 3D visualiations using computer game technologies. Another challenge for Arup was to present the plan and its progress to the investors and the general public in a way that was easy to understand. Engineering drawings are only suitable for experts. Artistic impressions, on the other hand, do not meet technical specifications, and public exhibitions are too costly and time consuming.

Therefore, the Saarbruecken computer scientists, together with colleagues from University College London, created "XML3DRepo". This service combines two research projects: the description language XML3D and 3D Repo, a version control system for 3D models. These make it possible to save 3D objects, change them and administer changes automatically. The project is sponsored in part by Arup.

The scene description language XML3D, developed by Sons, provides the representation in a web browser. "Through XML3D the complete model of King's Cross can be loaded in a browser and displayed on any

web-enabled device," adds Philipp Slusallek, Professor of Computer Graphics at Saarland University who is also a scientific director at DFKI and the Intel Visual Computing Institute. XML3D makes this possible by enhancing the recent web standard HTML5 with the necessary elements to describe not only text, images and videos on a website but also animated and interactive 3D objects. "Thus, all 3D components are part of the HTML code which defines the website. It can be completed with further notes or planning details by any web developer," explains Slusallek.

Engineers at Arup are convinced by the "XML3DRepo" technology. In the future, they will not only be able to simulate passenger flow and arrange the placement of CCTV cameras over the Internet, but will also be able to create realistic visualizations for the public. As the Foresight, Research & Innovation group at Arup writes on its website: "Built Environment Modeling (BEM) offers excellent opportunities to make meaningful stakeholder and public engagement not only possible but also cost effective."

Vertex Modelling, a London based company building the most accurate and detailed 3D model of London, will be also featured in XML3DRepo. The model stretches across a variety of urban landscapes from the new skyscrapers in the City of London and Tower Bridge to residential houses in the boroughs of Chelsea and Knightsbridge along with a variety of London's well known and iconic landmarks.

Kristian Sons believes in the potential of XML3DRepo. He plans to commercialize the software through a spin-off with his research colleague Jozef Dobos from University College London.

Provided by Saarland University