

Description of ZAG:

ZAG (Slovenian National Building and Civil Engineering Institute) is an internationally recognized research organization in the field of construction, with successful contribution in EU-funded projects (more than 40 in FP7 and H2020, [link](#)), with large network of European and Slovenian partners (excellent collaborations with Slovenian museums) and expertise in relevant areas (listed below) for this proposal **DT-Transformations-24-2020 / European Museum Collaboration and Innovation Space** ([link](#)).

We can offer help with the proposal development and digital support from microns to large scales, e.g. analysis of X-ray computer microtomography (XCT) of museum exhibition artefacts and preparation of building information models (BIM) for museums. ZAG has already finished some projects, where XCT and BIM activities were part of the research focus (building models and libraries, testing BIM and integrated building physics calculations and environmental footprint calculations, augmenting models with new parameters related to sensors readings etc.), in Q-Air and Innorenew BIM boost projects.

We aim to join a consortium as dissemination, exploitation and communication partner as well as a coordinating partner for activities in Slovenia. We are strongly interdisciplinary and well connected; we have a holistic approach to solving challenges and aiming on cooperation based on mutual trust. We will be happy to collaborate as experienced project partner in terms of digitalization.

Reasons of linking BIM and XCT within this call:

BIM can successfully address relationship between the building itself and the museum exhibits contained in it. Thus, BIM can be employed to manage building as well as exhibitions throughout the whole lifecycles of both: from planning, preparing /building /renovating /executing up to end of life of exhibition and the building. This brings different benefits: in terms of costs but also in terms of quality of executed works. Preparing BIM for the museums (M-BIM) means inserting elements as a BIM object including its geometric representation and physical/semantic data (dimensions, materials, weight, history etc.). We can also link different museum inventory elements (with the detailed information's of inner structure determined by XCT) and conservation databases for the museum management.

References of BIM and XCT:

Relevant EU and national projects:

Q-Air - Sustainable Prefabricated Glass Facade with Performance Exceeding State-of-the-art Glass Facades, H2020 (2017-2018).

Innorenew - Renewable materials and healthy environments research and innovation centre of excellence, H2020 (2017-2022).

VirtualMine – as modelling tool for Wider Society Learning, EIT Raw Materials (2017-2019).

Heromat - Protection Of Cultural Heritage Objects With Multifunctional Advanced Materials (2011-2015).

3D in 4D mikroskopija – razvoj novega učinkovitega orodja v geoloških znanostih, ARRS (2016-2018).

Conferences:

Jutraž, A. et. al (2019): Monitoring environmental and health impact data in BIM models to assure healthy living environments. *eCAADe SIGraDi*.

Mrissa, M. et al. (2020): Extending BIM for Air Quality Monitoring, International Conference on Construction Materials for Sustainable Future, Slovenia.

Malovrh Rebec, K. (2018): *Napredno načrtovanje stavb : 20. Dnevi energetikov, Portorož, 10. in 11. aprila 2018.*

Malovrh Rebec, K. (2017): *Zakaj BIM? Prihodnost projektiranja, izvajanja in upravljanja stavb : posvet Izzivi v lesarstvu in okrogla miza Industrija 4.0, Ljubljana, 9. 11. 2017.*

Guček Puhar, E. et. al (2018): Comparison and deformation analysis of five 3D models of the Paleolithic wooden point from the Ljubljanica River. V: *MetroArchaeo 2018: proceedings*. Danvers (MA): IEEE. cop. 2018.

Papers:

Turk, M. et. al (2018): The Mousterian musical instrument from the Divje babe I cave (Slovenia) : arguments on the material evidence for Neanderthal musical behavior. *L'Anthropologie*,122.

Turk, P. (2018): Ropotulje z Dežmanovih kolišč na Ljubljanskem barju. prispevek k arheologiji zvoka. *Argo: časopis slovenskih muzejev*, 61, [št.] 2.

More in detail on our web page ([link](#)), national and international projects ([link](#)).

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