Optimal Construction Management & Production Control

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Newsletter BIM2TWIN

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About

BIM2TWIN aims to build a Digital Building Twin (DBT) platform for construction management that implements lean principles to reduce operational waste of all kinds, shortening schedules, reducing costs, enhancing quality and safety and reducing carbon footprint. For more information you can visit the project website: www.bim2twin.eu.

This is the second issue of the BIM2TWIN project newsletter. It provides a brief summary of the activities conducted and the results achieved for what concerns Work Package 1 activities, that is the identification of the Digital Building Twin Processes

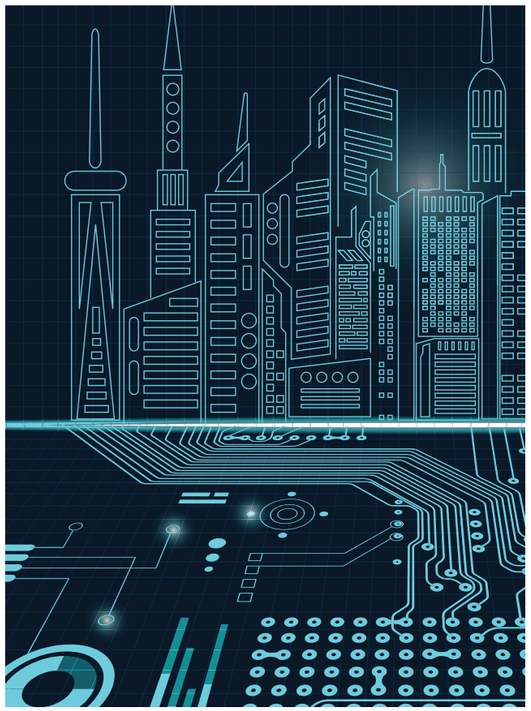
Results Update

WP1_TECNALIA
Digital Building Twin Process

The first year of BIM2TWIN project has been devoted to establishing the conceptual framework for the Digital Building Twin Platform (DBTP), both modelling the ideal construction process and workflows and setting the platform and services specifications through close cooperation between process and field experts and ICT solution providers.

As a result, the ideal **DBT-driven construction process** has been **conceptualised**, allowing **real-time status awareness** about the process.
To do so, the following activities have been carried out:

- Analysis of the as-is construction processes and **identification** of the **inefficiencies** in relation to **knowledge extraction** (considering cross-dependencies between progress and quality control, safety, machinery and process optimisation). Dedicated workshops and questionnaires have been developed for this purpose.
- Identification of key findings from the above, namely: **inadequate planning** of the work and **lack of execution control,** and **lack of knowledge about the impact of changes** and **unforeseen events** (Is information up-to-date and reliable? How any deviation affects the project schedule, budget or quality?).
- Therefore, it is not possible to **learn from past experiences** for sending feedback to the supply chain or optimizing future works.
- One key barrier for reaching the above is the lack of **user-friendly, integrated** and interoperable tools and data collection systems, with information accessible and updatable on-site and shared among all stakeholders.



With these inputs, a set of templates have been developed following BPMN standard (Business Process Model and Notation) which depict the consortium's vision about the future construction sites. It is inspired by the PDCA (Plan, Do, Check, Act) and lean principles. Some of the most relevant features of the proposed workflows are:

Holistic: different vertical domains (safety, progress and quality control, equipment optimisation and process efficiency, waste management, supply chain, etc.) must be considered in an integrated approach, detecting, and modelling the interdependencies.

Digital and open: based on open data formats and ontologies (e.g. IFC) and fostering the use of Open APIs for exchanging information.

Automated: manual and user-driven processes must be progressively replaced by automated services via machine learning and computer vision techniques to extract actionable knowledge. In BIM2TWIN, some of the most relevant use-cases will be implemented and tested in real sites.

Proactive: the DBTP will have learning capabilities with the aim to anticipate future problems or generate short-term alerts (e.g. planned activities for tomorrow require machinery that has not still arrived). Automatically detecting relevant deviations and launching simulations of what-if scenarios is a key aspect, so that manages can decide on the best alternative plan.

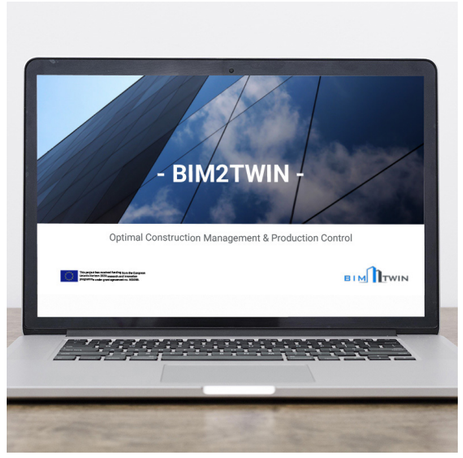
Multi-site and multi-scale: future scenarios will have multi-site information flows (send idle resources to another site where they are needed) or even multi-scale (communication between different digital twins, e.g. at city or infrastructure scale). Once this ideal scenario is devised, we require a mechanism to measure its fulfilment, which has also been addressed in the project by defining a KPI framework, structured in different domains and sub-KPIs, along with the specification of a cloud-based dashboard for supporting the workers and decision-makers in different temporal scales (short-term planning and information query, and long-term knowledge).

In parallel, the concept of **Process Status Model (PSM)** has been defined which models the cross-domain knowledge of the construction process. An ontology has been proposed which will be implemented through linked data and a property-graph database. Next activities in the project will be devoted to developing the platform which hosts the PSM and a set of APIs to interact with it, in addition to AI algorithms to automatically populate the PSM by reasoning on the real-time data (e.g. images and video streams

News

1ST PROJECT GENERAL ASSEMBLY
21st-22nd June 2021
Digital Event

At the beginning of last summer, BIM2TWIN project partners met remotely for the first semestral General Assembly. The meeting was planned to be held physically at some partner's premises, but due to the restrictions associated with the COVID-19 pandemic, it was switched to a digital event. Two dense days during which Work Package leaders presented to the entire Consortium the latest results and the activities conducted in months 1-6. Each session was enriched by proactive discussions aimed also at agreeing on the next steps of project development.



PARTICIPATION IN THE SUSTAINABLE PLACES CONFERENCE
September 29th-October 1st, 2021
ROME

SUSTAINABLE PLACES 2021
Sep. 29 - Oct. 1, 2021 | Rome, Italy

The Sustainable Places Conference represents since its first edition in 2013 a crucial event for the dissemination and discussion of project results in the field of Circular Economy and all those topics related to "Sustainability", in its multifaceted meanings, with specific focus on the Built Environment. The ninth edition took place in a hybrid format, both physically in Rome and remotely. BIM2TWIN joined the event in Rome represented by UniSMART partner. The Project Coordinator, Bruno Fies from CSTB, presented remotely the BIM2TWIN project during a specific session dedicated to Digitalization in the Construction Industry and to Digital Twins. Moreover, the project poster was displayed at the physical venue and uploaded on a specific section of the event website. It was a first networking opportunity for building synergies with BIM2TWIN-related projects.

PARTICIPATION IN THE CIB W78 CONFERENCE
October 14th, 2021
Luxembourg

Project Coordinator Bruno Fies represented BIM2TWIN project during a specific session organized with sister projects at the CIB W78 - LDAC Conference. The session, named "AI in the built environment", involved the projects BIMProve, CBIM, ASHVIN, COGITO. The workshop focused on technical insights and provided a first overview on the progress made and the lessons learnt so far, during project development. A roundtable discussion was then fostered to discuss how the Linked Data related outcomes of the different projects can support each other and persist through the BDTA after the independent projects have ended. .

1ST PROJECT REVIEW MEETING
26th January 2022
Digital Event

The Project Review Meeting is a fundamental cornerstone, especially the first one, as it can crucially steer and influence the further implementation of the project, starting from reviewing and assessing the activities conducted during the reporting period. The meeting was held remotely and all the Work Package leaders presented the key outcomes and main challenges of the first 12 months of project implementation. The Project Officer and the External Reviewers provided the consortium with remarkable comments and suggestions, underlying also main criticalities and areas of improvement.

Keep in touch

Are you interested in knowing more about BIM2TWIN technologies?
Are you a professional in the construction industry interested in collaborating with BIM2TWIN partners?

Contact us to share your feedback and ideas on this page.

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BIM2TWIN

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