



Holistic and Optimized Life-cycle Integrated Support for Energy Efficient building design and construction

PROJECT PUBLISHABLE SUMMARY

Grant Agreement number: 609138

Project acronym: HOLISTEEC

Project title: Holistic and Optimized Life-cycle Integrated Support for Energy Efficient building design and construction

Funding Scheme: Collaborative scheme

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1. Final publishable summary report

1.1 Executive summary

The HOLISTEEC project started in October 2013 responding to the measures, put in place by the European Commission, for the promotion of buildings energy efficiency in Europe towards the achievement of ambitious climate and energy targets and to pave the way for further energy efficiency improvements. The project run for 4 years and ended in September 2017. The concept behind HOLISTEEC was the development of a **BIM-based, on-the-cloud, collaborative building design software platform** featuring advanced design support for multi-criteria building optimization. Specifically, the platform is **composed by 9 functionally integrated tools (via APIs)** to enable the proper execution of building design and simulation workflows, considering also the impact with the surrounding city environment. The main features of the platform are presented in the following list:

- Based on a layered architecture;
- Based on standard formats (IFC, CityGML, BCF);
- Provided with a modular and open design supporting multiple interfaces: all components interact through well-defined (published) REST APIs;
- Provided with a KPI management system based on the duality between requirements (at the specification level) and foreseen performances (at the design/evaluation level). This is a new development, not available in any other software, inspired and compatible with the COINS methodology that could be at the basis of future standardization;
- Enables collaborative working;
- Allows taking into account the influence of the neighborhood on building design;
- Involves simulation experts in successive design loops, from the very beginning of the construction project;
- Integrates the design information from different discipline BIMs;
- Supports multi-criteria simulation and verification of predicted performances (based on available information at each design stage) against predefined performance targets (which may be set contractually between designers and future building owners);
- Based on data repositories to centralize information and data that are progressively generated and updated along building design process by multiple stakeholders.

The preliminary step towards the definition of such a platform has been the definition of a comprehensive **building design methodology** to be implemented and supported by the HOLISTEEC collaborative software platform. This methodology is a BIM based design methodology that connects ICT tools to the process to help to implement integrated design and performance based design principles, taking a step forward in comparison to traditional practices that tend to consider separately design and assessment activities. The focus of the methodology and tools in this project is in design phases. Simulation tools are possible to use also in construction and operation phase, but the need is greater in design phases.

Validation and testing activities for both HOLISTEEC design methodology and software platform have been carried out through **five demonstration projects** either as replay of design activities completed earlier or as extra activities parallel to on-going construction projects. **Benefits from the use of the HOLISTEEC methodology and tools have been assessed** in terms of time savings, process streamlining, value added to the process, value added to the end product (i.e. the buildings under design) and support for learning and continuous development. Exploitation strategies towards the commercialization of project results have been identified as well and particularly remarkable is the goal to have the first commercial version of HOLISTEEC platform available at the end of 2018.

1.2 Project Details

<http://www.holisteecproject.eu/>

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Beneficiary Number	Beneficiary name	Beneficiary short name	Country	Date enter project	Date exit project
1 (coordinator)	Rina Consulting - D'Appolonia S.p.A.	RINA-C	IT	1	48
2	Koninklijke Bam Groep Nv	BAM	NL	1	48
3	ACCIONA CONSTRUCCION SA	ACCIONA	ES	1	48
4	Nemetschek Allplan Slovensko, S.R.O.	NEM	SK	1	48
5	Senaatti-Kiinteistöt	SEN	FI	1	48
6	ENGIE	ENGIE	FR	1	48
7	S.T.I. Engineering S.r.l.	STI	IT	1	48
8	Bergamo Technologie Sp z o.o.	BGTEC	PL	1	48
9	Cype Soft S.l.	CYPE	ES	1	48
10	G.E.M. Team Solutions Gdbr	GEM	DE	1	48
11	Geomod Sarl	GEO	FR	1	48
12	Pich-Aguilera Arquitectos S.L.P	PAA	ES	1	48
13	Centre Scientifique et Technique Du Batiment	CSTB	FR	1	48
14	Commissariat A L'energie Atomique Et Aux Energies Alternatives	CEA	FR	1	48
15	Fundacion Tecnalia Research and Innovation	TECNALIA	ES	1	48
16	Technische Universitaet Dresden	TUD	DE	1	48
17	Teknologian Tutkimuskeskus Vtt Oy	VTT	FI	1	48
18	Iabi - Institut für angewandte Bauinformatik e.V.	IABI	DE	1	48
19	National Taiwan University of Science and Technology	NTUST	Taiwan-ROC	1	48

