INTED 2020

14th International Technology, Education and Development Conference

2-4 March, 2020 - Valencia (Spain)

CONFERENCE PROCEEDINGS

Published by
IATED Academy
iated.org

INTED2020 Proceedings
14th International Technology, Education and Development Conference
March 2nd-4th, 2020 — Valencia, Spain

Edited by
L. Gómez Chova, A. López Martínez, I. Candel Torres
IATED Academy

ISBN: 978-84-09-17939-8
ISSN: 2340-1079
V-153-2020

Book cover designed by
J.L. Bernat

IMPLEMENTATION OF THE BUILDING INFORMATION MODELING TECHNIQUE IN THE BACHELOR'S DEGREE IN CIVIL ENGINEERING

J.M. Romera, A. Santamaría, M. Zubizarreta, A. Orbe, H. García, M. Larrauri, J. Cuadrado, E. Rojí

University of the Basque Country UPV/EHU (SPAIN)

Abstract

Building Information Technique (B.I.M.) is a common technique in the building projects. This method is being extended to civil works projects, particularly to those related to transport infrastructure. Since the implementation level in Spain is lesser than in other countries, the Spanish Government started a strategy to enhance its implementation and use in 2015. As a consequence of it, the number of B.I.M. based projects has increased largely in 2019 and although it is not yet compulsory in Spain, some public administrations have started to take into consideration the attachment of a B.I.M. model to infrastructure projects in public tenders.

The main advantages of this technique are an automatized design of the project, and enhancement of the prefabrication and the computation of the interferences between the different parts of the project.

This work focuses on the implementation of the mentioned technique in the Civil Engineering Degree of the University of the Basque Country UPV/EHU. With this aim in mind, an analysis of the current state of implementation in the Faculty of Engineering of Bilbao and a proposal for enhancing the knowledge about this methodology is presented.

Keywords: Building Information Modeling, Civil Engineering, Information and Communication Technologies.

1 INTRODUCTION

Building Information Modeling (B.I.M.) is a collaborative work methodology for the management of projects through a digital model. This digital model forms a large database that allows management of the elements that form part of the infrastructure through its life cycle [1]. It is a technique that was developed in the framework of the building engineering projects. It has been extended to the transport infrastructure projects, such as roads, railways, airports, …

The main advantages of this technique are the high level of automation of the project in the design phase, the enhancement of the prefabrication, the computation of the geometric interferences between the different parts of the project and the possibility of using the virtual reality in presentations. This methodology can be used too in maintenance projects.

In some countries like Sweden, United Kingdom, France or the United States of America is being extensively used. However, its use in other countries like Spain is not prevalent, with the subsequent loss of competitiveness.

In the case of Spain, Spanish Government started to plan the enhancement of such a methodology in both building and civil engineering projects in 2015. During 2019, a considerable increasing of the amount of B.I.M. based projects has been observed, and one in three are transport infrastructure projects. In this kind of projects the B.I.M. requirements have taken place more in the execution stage than in the design phase. Moreover, it has been required more in railway and roadway projects than in the rest project types. The Spanish Government's forecast is that in future all the public tenders in building and civil works projects will be done with B.I.M. requirements.

This methodology must be implemented by using a software. The companies that provide this kind of software encourage their costumers to make an appropriate and realistic planning. Otherwise, the implementation could be unsuccessful. In this planning, it is important to take into account the sources that are already available and the previous knowledge of the professionals of the company about computer assisted design. In this case, the current state of implementation of this technique in Faculty of Bilbao is analysed and then the necessary learning infrastructure, the implementation method and the learning results are studied.

ACKNOWLEDGEMENTS

The authors wish to express their gratitude for funding to UPV/EHU PPGA19/61 contract as well as to the IT1314-19 (Basque Government) and GIU19/029 (UPV/EHU) research groups.

REFERENCES

[1] Es.BIM, Accessed 20 December, 2019. Retrieved from https://www.esbim.es/es-bim/

[2] Bachelor's Degree in Civil Engineering in the Faculty of Engineering of Bilbao, Accessed 20 December, 2019. Retrieved from https://www.ehu.eus/es/grado-ingenieria-civil-bizkaia/

[3] Autodesk Infraworks, Accessed 20 December, 2019. Retrieved from https://www.autodesk.com/products/infraworks/overview/

[4] Certified report of the Bachelor's Degree in Civil Engineering in the University of the Basque Country (UPV/EHU), Accessed 20 December, 2019. Retrieved from https://gestion-alumnos.ehu.es/tmp/Ingenieria%20Civil.pdf