Combined LOD-Definition for Bridge Maintenance and 3D City Maps

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Abstract

By applying BIM in the field of bridge maintenance and inspection, the research project "Public Administration 4.0", founded by the city council of Vienna, has shown that the required Bridge-BIM-models for bridge inspection can also be used in other areas of public administration, such as 3D City Maps. To make this possible, the intersection of the requirements for geometric and semantic information must be defined from both fields. The research has shown that a LOD300 (Level of Detail) can be applied for bridge inspection whereas for 3D City Maps a LOD2 could be defined according to the Citygml 2.0 Standard. The combined LOD could then be defined with LOD300 & LOD3, therefore the bridge models for 3D City Maps in Vienna have to be modelled more detailed in order to fulfill the requirements for bridge inspection. Since there is no semantic information in the LOD-Definition of the Citygml Standard for 3D City Maps, this needs to be elaborated to complete the LOD interface.

Keywords: 3D City Maps; BIM; bridge inspection; bridge maintenance; Level of Detail; Level of Development; LOD.

1 Introduction

In the last decades, step by step technological solutions have been introduced into public administration under the term of digitalization. These technologies, as well as the technological visions that have been taken over from the private sector, have an impact on the process organization and partly also on the organizational structure of the administration. The term Administration 4.0 was coined in the same way as the common term "Industry 4.0", an idea in which globally networked cyber-physical systems independently exchange information, trigger actions and control themselves independently in real time. [1] Administration 4.0 uses the possibilities of intelligently networked objects and cyber-physical systems for an efficient and effective completion of public tasks [2] and enables systematic and cooperative action in everyday life. [3]

Therefore, the research project "Public Administration 4.0" was launched to analyze how digitalization affects personnel and organizational issues. To explore these effects technical as well as administrational knowledge is needed. Therefore, two departments of the University of Applied Sciences of Vienna (Department Building and Design and Department of Administration) worked together to develop interdisciplinary and transferable scientific findings from which documents and recommendations for action can be derived to improve decisions in the field of digitalization in the public sector. The project should also create synergies with other interfaces of the administrative departments in order to analyze whether the gained knowledge can be used elsewhere.