In this paper we present a computer aided method supporting co-operation between different project partners, such as architects and engineers, on the basis of strictly three-dimensional models. The center of our software architecture is a product model, described by the Industry Foundation Classes (IFC) of the International Alliance for Interoperability (IAI). From this a geometrical model is extracted and automatically transferred to a computational model serving as a basis for various simulation tasks. In this paper the focus is set on the advantage of the fully three-dimensional structural analysis performed by p-version of the finite element analysis. Other simulation methods are discussed in a separate contribution of this Volume (Treeck 2004). The validity of this approach will be shown in a complex example.