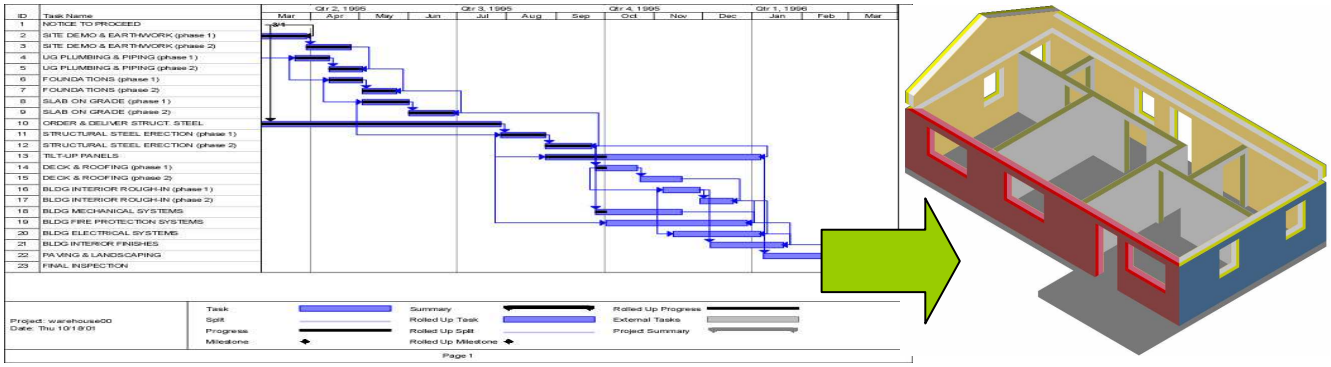
Topic XX:
Visualization of Microsoft® Project construction sequences with a game engine framework.

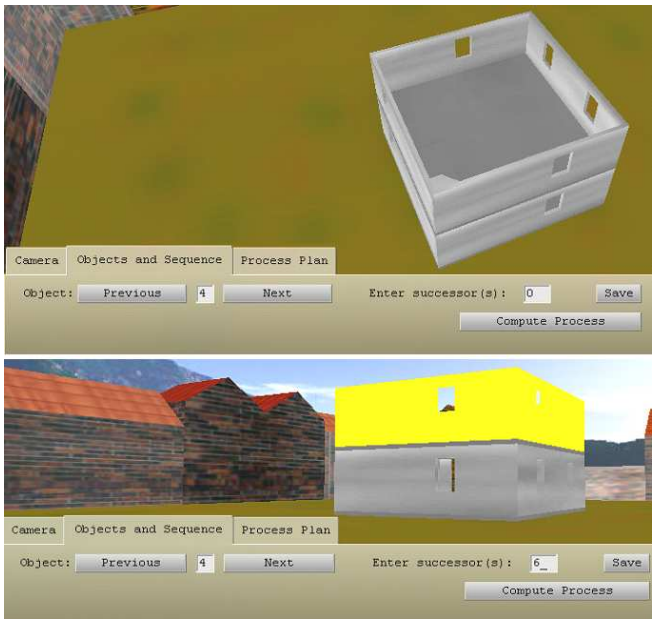
contact person: Dipl.-In.g Martin Egger (m.egger@bv.tum.de)

A building process plan represents the temporal and organizational sequence of the work on the building site in graphic form. Usually building process plans are in the form of bar charts (picture 1). Such representations are easily understandable and represent dependence between the individual construction works. However they do not permit a geometric checking of the construction work. For the building industry it can be interesting to plan with appropriate programs not only the building process of a building but also to visualize it in a simple way. This can be helpful in various aspects. So problems can be promptly recognized and alternatives can be pointed out already in the planning phase without large costs, for example: to recognize and to eliminate collisions of different building objects or building sequences or to prepare the building site equipment and the crane location optimally.



Picture 1: building process plan and geometric representation

For this purpose a software framework using the game engine IRRLICHT was implemented during the last software lab. It allows the user to import a building project into the visualization engine and to create a construction schedule interactively in this software (picture 2). For the construction schedule there was implemented a rudimentary network planning method, which allows the user to sort the construction objects (walls, slabs, roofs) and to provide them with additional information to the construction sequence of the building (position, construction period, dependence). This framework provides a basis for a further development and enhancement of interactive construction unit-orientated building process planning and visualization software.



Picture 2: visualization in the game-engine IRRLICHT

The **task of this project** is to further develop and to enhance this framework of an interactive construction sequence planning and visualization software in C++ and to combine it with the Microsoft® Project software. Therefore, an Application Programming Interface (API) exists in Microsoft® Project to allow the programmer to get direct access to the program and the needed information. Through the GUI it should be possible to import a building project into the framework, to perform a complete construction sequence of a whole building in a user friendly way and to visualize it in the game engine. To examine the functionality of the new program a non-trivial building object should be taken. The necessary data management can be done completely in Microsoft® Project or over a SQL database engine.