



University Ljubljana, Slovenia

Arhitektonika d.o.o, Ljubljana, Slovenia

Clever Construction

The new buildings at the University in Ljubljana are light, spacious and modern. The large glass areas, which let a lot of light into the rooms provide a pleasant, almost futuristic, atmosphere. In short: it's easy to study and live in the newly built part of the university. It houses the social sciences faculty with 4,000 students and a student residence hall.

The architectural redesign was urgently needed. "The old residential building from the 50's was no longer structurally safe and had to be torn down, together with parts of the old faculty building," explains Andrej Goljar, project manager at Arhitektonika d.o.o in Ljubljana. The crumbling masonry paved the way for a stable construction made of reinforced concrete. The residential building contains 71 apartments of different sizes and functions – six suitable for disabled residents – with a total of 243 beds, a separate kitchen, bathroom and common room. To save space, long corridors within the building were avoided. Instead, all apartments are accessed from the outside.

The ground floor and basement of the six-story hall of residence contain the offices for the faculty's employees. The faculty building itself also contains other offices, as well as two book store rooms in the basement, a large conference room on the third floor, and a total of 12 lecture halls. What's special here is that the walls between the lecture halls and hallway are made of glass. These transparent elements create a feeling of spaciousness and therefore provide a pleasant and creative working atmosphere. "Through these boundary free areas, we have created light, transparent rooms – both inwards and outwards," adds Jurij Šket, architect and co-project manager at Arhitektonika d.o.o.

All to plan

The Slovenian architectural firm was not planning and managing the construction and renovation of a faculty building for the first time. In 1995, the architects had built the new block of the social sciences faculty building. The designers and building clients – the faculty, Ministry for Schools and Sport and the Ministry for Science and Technology – are this time all benefiting equally from the experiences gained from many years of past collaboration. "There were no stumbling blocks when executing the project, everything went according to plan," says Andrej Goljar. The project was quite demanding, because the schedule and budget were tight and space for the building limited. "The area we had to build on was very narrow and had to accommodate a lot. We also had to integrate the new extension into a, semi-cylindrical existing faculty building," the architect states. The building designers mastered this challenge with flying colors: because there was

no building space available adjacently, they built upwards over several stories and also built a large sized basement. Students and faculty employees were able to reach the old part of the building via a corridor on the ground floor. "Despite the rigid specifications, we were able to create a lot of usable space, in order to house the faculty, hall of residence and conference room," says Jurij Šket. The tight budget was also met: the complete renovation cost just 11.5 million euros.

Intelligent Integration

The architects use Allplan software solution in order to meet even the most difficult requirements as simply and efficiently as possible. BIM stands for Building Information Modeling and enables planners to carry out integrated project processing. After the initial drafts, the planners create a rough, virtual model on the computer, which they can then modify until they arrive at the final design. In the virtual building model, all project-relevant information is entered centrally and made available to all those involved across the complete design, planning and construction phase. "On this project, the time pressure was high, and we therefore took advantage of the option of deriving quantity and cost calculations directly from the virtual model," explains Andrej Goljar. The architects used this planning method, integrated in Allplan, for the first time when redesigning the university building. The switch has paid off: "In the past, we measured and derived the material costs using the drawn plans. The new method provides us with more reliable and accurate results far more quickly," states Jurij Šket.

Virtual Presentation

The four-person team Arhitektonika d.o.o has been using Allplan since 1995. The method of working on one and the same model and being able to coordinate the various planning processes exactly has proven reliable. Jurij Šket: "We have completely changed the way we work. Before, we used separate individuals for the different phases such as draft, approval or execution, but today we all work together on one model and are far more efficient."



After the approval of their initial drafts, the architects worked on the presentation in parallel with the planning phase. They used CINEMA 4D for this. For a photo-realistic depiction of the building, the model data was simply imported from Allplan and assigned various materials and textures. The presentations were a huge benefit to the architects in particular for execution planning, because not only the building clients, but also the employees of the university had a say in the design of the

new building. In detailed project presentations and meetings, questions and requests were noted and some were also incorporated in the design and plans. For example, the employees had serious reservations about working in what they imagined would be a dark basement: "They couldn't imagine a basement could be light enough, so we showed them through our presentation just how much light would enter the rooms and what it would look like to be sitting at a desk and looking outside," explains Jurij Šket. In this way, it was possible not only to dispel any fears, but also get started quickly on construction planning.

Efficient Collaboration

The Slovenian architecture firm performs tasks ranging from design, approval and execution planning right through to construction management. They work with partner companies for engineering services and building facilities.

Integrated processing of projects based on the principle of Allplan and the exchange of building data between the partner companies is something of a rarity here. Usually, 2D systems are used for planning and the data is then transferred in DWG format. This quickly leads to a large number of individual activities that are difficult to control and coordinate: data losses, transfer errors and interface problems.

This was not the case during collaboration with partner company Stating, which was responsible for the structural calculations and also used Allplan. Both partners were able to use the building data seamlessly. "All the important planning data was available in digital form and could be synchronized and exchanged very easily," says Jurij Šket. Improved communication and coordination led to a better planning quality, among other things. Because the partners could keep project information constantly up-to-date in an integrated environment and make this information generally available, they always had a transparent overview of their project.



What do you think are the current and future challenges faced when planning buildings today?

The greatest challenge is in offering clients comprehensive solutions in an ever shorter space of time. Because the timeframe for projects is becoming tighter, and the demands of clients are increasing, this means providing more information in a shorter time. This can only be achieved by using modern, integrated software solutions. Stable operating systems, powerful databases and unrestricted communication all form the basis for a process that will change the world of building design, construction and management in the coming years.

In your opinion, what are the advantages of integrated working in 3D?

Thanks to 3D planning, we can control all planning steps from the very first sketch. This reduces the number of errors and makes us far more efficient because the work results can also be analyzed. For example, when we also derive detailed quantities for building

costs and bills of quantity from the virtual building model. More and more companies now also demand 3D presentations. Here in Slovenia, a lot is happening at the moment in this respect.

What role does an integrated software solution play when bringing together all the partners involved in a building?

Building Information Modeling can only be a success if as many of those involved in the building process as possible can access the data relating to the virtual model. Because people are increasingly collaborating while based in different locations, it is hugely important to keep risks relating to quality, time and costs as low as possible. To improve planning efficiency over the long term, the use of an integrated planning method and the networking of all those involved is absolutely essential.

What impressed you the most about Allplan?

Thanks to Allplan we are able to always keep project information up-to-date in an integrated environment and provide this information to every planning partner at all times. Interlinked information increases the productivity and quality of projects over the long term. In addition to the advantage of integrated quantity takeoff and cost determination, the system also "thinks" when every line is drawn and informs us of design contradictions. The improved data comparison reduces the sources of error, which would otherwise lead to costs and delays.