



__Customer__



The customer is Ministry of Public Works of Turkish Republic. Ministry of Public Works is an institution that all organizations which are responsible for public services on the development of Turkiye are connected. Since 1848 where the governmental infrastructure was

dramatically changed according to the actual needs, Ministry of Public Works concentrated all the foundations with minor exceptions under its control and it guided them. With this qualification, it is one of the major and the biggest ministry of the government.

BEP-TR (Building Energy Performance Certification) is a national project that the Ministry of Public Works is intended to create to let current and future buildings energy efficient. The main goal of the regulation of “Energy Performance for Buildings” prepared by the Ministry is to classify greenhouse gas emissions according to the primary energy and carbon dioxide (CO₂)



Methodology meetings with University members

emission of buildings and to prepare the infrastructure of environmental protection. The regulation is based on Directive of Energy Performance for Buildings (2002/91/EC) of EU (European Union). Two main regulations (BEP and MISSIGP) prepared in 2008 are also the main parts of Certification Program of EU's Directive.

In 2008, the ministry delegated methodology and software of the project to a company to the lowest quotation price but the winner company's main job was not software development and because they were never done such a big project, they finished half of the methodology in double time and only screen designs of the software. At June 2010, the ministry delegated the project this time to IZODER (Thermal, Sound, Water and Fire Insulation Manufacturers' Association). IZODER was an association and smaller than the first company but they have had created a simulation software (TS825 R1) where most of the companies from the insulation sector were still using. Also IZODER were familiar with the calculation process. After starting the project, IZODER contacted Maysistem and they made a contract with us for the software production.

Project



BEP-TR national software could calculate the maximum energy need for heating, cooling hot water, ventilation and illumination of different type of buildings like homes, apartments, hotels, hospitals, Shopping Centers etc. according to their regions (temperature, wind effect etc.), to their architecture (orientation, other buildings etc.) and to the standards (TS825 Heat Insulation standard etc.) that it had to be built accordingly. It then calculated the CO₂ amount that would be released to atmosphere from the equipment that would generate the energy needed. It would take consideration also green energy production technology used at the building. If the CO₂ level was beyond the determined threshold, it would not allow the building to be constructed.

The software was for creating a certificate for each and every one of 8.000.000 new and old buildings in Turkiye. All of these buildings' designs would be entered to the system and the software would calculate their energy needs. After that, this value would be compared with the energy calculated for a reference building at the same spot. The comparison gave the grade of the building.



Methodology meetings with University members, Companies, Associations and Non-Governmental Organizations

To serve to all buildings around Turkiye, to store all data centralized at the Ministry and to have a quick response to any chagement on the methodology; it was designed as a web application. It has to support 10.000 concurrent users.

The main specialty of the software and the methodology was to calculate the energy need hourly, not monthly. It took in consideration the building type and usage hours, internal layers of walls and windows, sun gains, the losses of mechanical systems types and many more parameters. It was simulation software that calculated the energy for 365*24 on each thermal zone.



Progress meetings with Ministry directors and IZODER

The most challenging part of the project was the shortness of time. There was only 5 months up to the end. In this short time, the methodology had to be finished, software had to be redesigned all over and then the software had to be written from the scratch. Coding and testing procedures had to be done synchronously. This made the project very hard to finish in time.

Solution



At July, we just have done the first meetings. The main meetings with the methodology experts and academic staff could only be at August.

The project was redesigned again and again with different point of view which was not at the original project design such as consistency, calculation speed, parallel processing, user interface design and verification and many more. All these concepts were added to the project's different pages.

All missing abilities of User Interface were completed to assure the users to input data to the system as quick and as error-free as possible. Still, because of lack of time, the old screen designs were used without too much change.

The whole methodology was revised with the help of staff from national universities, sector companies, chambers and IZODER. It was regenerated in accordance with the software. Project team was constituted from 4 IZODER managers, 5 people from the Ministry including 1 General manager, 3 directors and the Minister, 9 academic staff (Professors and Associate Professors), 5 sector representative and as Software group Maysistem with 9 Senior and 2 Junior programmer, 1 Software director (also general manager), in total 37 persons.

The methodology's mechanical calculation part was completely missing. It was completed according to ISO and DIN norms. The algorithms were produced from the final methodology. To let the professors to test the results of the calculation methodology, extra offline software packages were coded and served. While academic staff was testing the methodology, we were working over the kernel of the software and designing user input screens and database structure also testing speed and security. All user interface screens were coded with the self-ability of blocking user input errors.

Before the completion of the software, the training of trainers was made with the working sections for the potential users of the system within Ministry to gain time. It also helped us to find out what the end user wanted. This was like a beta test of the software.

At November of 2010, after all trainings were done, IZODER has announced the launch of the certification system. In that day, the Minister of the Ministry of Public Works of Turkiye, Mustafa DEMİR got the first BEP-TR certificate for the building of Ministry of Public Works in front of the public, press and associations. We served the software on a server that we built there. The grade of the building was "E".



The time was very short so the whole team was worked on code as one even on holidays until December 31st of 2010. We created the software that will help Turkiye until the next governmental procurement for version 2 of BEP-TR. We activated at the night of December 31st, Turkiye's National Energy Performance Certification Software for Building.

For 10 more months, we supported and developed BEP-TR for the bugs and extra features. After that time, we delivered the source codes of the software to the government. BEP-TR is still in use as a National Certification Software.

__Conclusion__



The total budget of the project was about 350.000\$. By mid of 2014, there were more than 200.000 certificate created and delivered by the system. Total amount of project created including trainings and simulation projects was approximately 600.000. For the second version of the project, the government worked up to 2014 and at 2014, new governmental procurement took place. Before that procurement process finished, the Ministry wanted us to demonstrate the new version of TS825R3 software that calculates energy needs of buildings with an easier way. After the demo, they asked for a copy of setup of TS825R3. They mentioned that they were considering this new TS825R3 software for the calculation of homes and apartments only. If the test results are satisfactory, they may exclude certification calculations for homes, apartments and residences part from the government procurement of BEPTR V2 and they may want from Maysistem to adapt the TS825R3 to BEP-TR V2 to use it for these certifications.

The main website of the project is: <http://beptr.bep.gov.tr/>

Some samples from the press:

http://www.cumhuriyet.com.tr/haber/diger/203092/Enerji_klimlik_belgesi_yazilimi_BEP-TR_tanitildi.html

__Result__

