WHITE PAPER CONSTRUCTION DIGITAL INFRASTRUCTURE (WP3)

Introduction

This white paper describes the experience of the project partners while carrying out Work Package 3 of the Erasmus+ CAPIRE project. It will explain what steps we took and why we chose that path. We will particularly zoom in on the obstacles and setbacks we encountered during the work and how we solved them. This white paper aims to help others learn from our problems and mistakes so that they can prevent or solve them more easily.

Expertise

Among partners, there was no one with specific expertise about building a website and programming software. Two members had some experience with front-end web design, and one member had experience with using online training tools for education. This means that during the project, we had to lean on the company that constructed the platform. Looking back, what we missed was a digital expert who understood the work of the developers and could think along with them to solve technical problems. Also, an expert could have advised us with digital choices, of which we could not foresee the consequences.

Programme of requirements

Right at the start, we decided that the Culture Simulator should not become part of one of the big and renowned educational websites, since there it would be easily buried among the mass of other content. In addition, most of the content there is behind paywalls. This is completely contrary to our aim to provide the Culture Simulator for free in order to reach the maximum number of users. Thus, we opted for an independent website.

We started with sketching the design of our website on a few Word pages, inspired by existing websites, and discussed the rough layout, the content and the user options. This led to the writing of the programme of requirements.

Try-out of front-end design

One of the members of the group is teaching at ESIEE, a technical university in Paris. Third-year students of software development have to carry out a project for real outside customers as a study assignment. Two groups took our idea and designed a model for the front side of our future website. This visualisation helped us to make our requirements for the website more precise and concrete.

The selection of the developers

For the website, a budget of € 10.000 had been reserved. We expected that constructing the basic website would not be too complicated, since there must be plug-ins available with a comparable structure for multiple-choice tests.

Work Package 3 was assigned to the partners Twente and Eiffel. There were four parties invited to present a plan and a budget. The project leader of the team reached out to the association of ICT students, but the talks did not lead to a concrete bid. The project leader then contacted a professional company which had previously developed an app for the department of psychology at the University of Twente. In their offer, they showed a very professional approach. However, the website they were offering was a basic one, did not contain all our wishes, and with a price of € 25.000-30.000 it was beyond our budget. Another experienced developer consulted made an offer that was even far higher.

The fourth offer was proposed by Junior ESIEE, a company connected to the ESIEE university, which gives last-year students the opportunity to develop software for market parties. They have been working for renowned companies in France. In the background, there are teachers of the school whom they can fall back on. Junior ESIEE is a mediator and does not employ developers, but selects students who are capable of doing the job and contracts them for specific assignments. They could fulfil all our requirements roughly within our budget. Around November 2023, we decided to choose Junior ESIEE to construct our digital tool.

Preparing the detailed offer

From this point, our contact person from Junior ESIEE started to make a concrete and very precise description of the website they would have to deliver. This lasted several months, until March. The final sum was slightly higher than our budget, but we could shift other budgets to the construction of the website and had our amendment approved by the National Agency. Also, they had found two developers to build the site.

Preparing the contract

The contact persons for customers change every year. In Spring 2024, we got a new contact person. He had to draw the contract in which the deliverable description would have to be embedded. This took again very long, in spite of the project leader's urging. After several changes in the text, he came up with the final contract mid-July, the time when most of the staff are already on holiday. It was complicated to have it signed by the person who had authority. The project leader insisted that the two developers start their work already in August and that by the 1st of November, there should be a functioning test version, which we could try out. This was promised.

The development of the website

However, on the 1st of November 2024, there was no test version of the website available. We extended the term to the end of December, since the written case stories would not have been ready until January. But this was not kept either.

At the beginning of January 2025, the head of Junior ESIEE intervened, and we heard what had happened. The two developers had not accomplished the assignment, had continued their study in Korea, and contact was lost.

They promised to select a new crash team of developers to fix the problems with the site and have it functioning around mid-February. This was crucial for us because we had contacted a great number of colleagues, teachers of intercultural management, who were willing to try out the tool and give their feedback. We had promised it would be available from February onwards. In fact, this time Junior ESIEE did not disappoint us, and by mid-February, we had a functioning (but not complete) site. But before it could be used, we had to upload the case stories to it, which also takes time. At the beginning of March, we had the basic website with a number of cases in English and German language ready, so that colleagues could try it out.

Insufficient capacity

When trying out in the classroom, it appeared that the platform crashed when more than 10 people logged in. The developers were then asked to make the construction leaner. For example, the home page loaded at a very slow pace. They removed all inefficiencies in the construction, but still, the site could not support more than about 10 people at a time, which is completely insufficient. With external help, it was found out that the traffic capacity of the website was too limited, since it was placed on a shared server. When the website was transferred to a separate server, there were no capacity problems anymore. This did, however, lead to higher fees for the server.

With this version of the website, it was not completely finalised according to the contract. Also, the developers had not quite understood the functionalities we wanted and built it in such a way that it was very impractical. When they would have asked us, we could have told them.

The project leader drew up a list of points that were not yet delivered but were due according to the contract. Junior ESIEE, which works with strict administrative project deadlines, wanted to close the project in May. We would then have to sign off that everything went according to plan and pay the remaining amount of the contract sum, and they promised to fix all remaining things in the repair period of three months. The project leader did not agree to this. He suggested that the deficiencies would be noted in the closing procès-verbal, with the promise that they would be corrected without charge. Junior ESIEE finally, in September 2025, got permission from the supervisory board to arrange it in this way.

The website hacked

In the course of October, the last month of the project, the website was hacked and was not accessible anymore. The people from Junior ESIEE did their best and were able to get it functioning again. But just one day before the tool was to be presented to international trainers at a conference in Budapest, it was again down. Junior ESIEE managed to get it running, but it was clear that professionals had to be hired to solve this. Not only did the site show a malfunction, but several hundred cases that had been uploaded by two students had vanished.

At first, it was tried, with the help of the specialists of the web hosting company, to retrieve this data, but that appeared to be impossible. Then we decided to have the whole website thoroughly cleaned of any remaining elements of the hack. Now the website is again up and running, but it caused an enormous delay in uploading the case stories.

Learnings

Generally speaking, the building process went all but smoothly. From it, we can draw several lessons.

A. Long process with many delays

The contracting and building process took a very long time, which surely would not have been the case when working with a commercial company. The reason is probably that we had to deal with French students, who follow lectures every day from 9.00-18.00 during the week and have less spare time to work on the site than students in Germany or the Netherlands. Looking back, we could have put harder pressure on them to speed up the process, for example, regarding the long time for writing the detailed offer and the legal contract. Choosing Junior ESIEE was choosing for a lower price but also for a less reliable and less experienced partner. Of course, Junior ESIEE could not be blamed for the fact that the two original developers disappeared and left the site unfinished. But a commercial company would have noticed the problems earlier and would have intervened by quickly replacing these with new developers. Anyway, an external party is more difficult to control than internal project partners, so control mechanisms should be extra strict.

We should have started with a very detailed planning with milestones and deadlines, including buffer time in case deadlines could not be met. In digital projects, deadlines are often missed. We should have organised regular (monthly?) meetings with the developers to keep track of the progress and keep deadlines, and insisted on immediate reporting of problems and delays.

B. Lacking a digital specialist

In our team, we had no digital specialist who could act as a webmaster and advise us in technical matters where we are more or less ignorant. This person would know the language of developers and could have pointed to practical solutions for problems. He or she would have been able to act more quickly in the case of the hack, instead of us being dependent on external parties to assess and solve it.

We entrusted everything to Junior ESIEE, and they did their best, but a technically trained person would understand better what they were doing and could keep better control over the process.

C. Mediating company

We were dealing with a mediating company, so (most of the time) not with the developers themselves. This has the downside that developers have been installing functionalities as they understood how they should work, and we could only correct them when they were ready. It is preferable to have direct contact with developers at several moments during the building process in order not to waste time on building structures that are not needed or not practical.

Even if the contract partner is a mediating company, we could demand that we have contact with actual developers at regular intervals.