

Developing integrated ACM competitions website

Bojan Pikel, Nataša Kristan, Žiga Ham, Andrej Brodnik

Fakulteta za računalništvo in informatiko Univerze v Ljubljani, Tržaška 25, 1000 Ljubljana
E-pošta: bojan.pikl@gmail.com, natasa.kristan515@gmail.com, ziga.ham@gmail.com, andrej.brodnik@fri.uni-lj.si

Developing centralized ACM competitions website

In this paper we present our work on the centralized website for ACM (Association for Computing Machinery) computer science competitions in Slovenia (<http://tekmovanje.acm.si>). The reason to make a centralized website was the fragmentation of ACM competition websites. We started with an analysis of international competitions around the world and their websites. We divided them into three groups by age of contestants: primary school competitions (K-8), secondary school competitions (K9 – K12) and university competitions. Along the competitions we also analyzed some of the online judge systems used by various competitions. Our goal was to make an integrated website that also include competing environments, to simplify the publication of information, and to minimize the fragmentation of information. We made a new website using an open source content management system Drupal. The website includes all Slovenian ACM competitions and information about them in one place.

1 Current State Analysis

The project started in October 2011 as a student project in course *Computer Science in Practice*. First gathered information about national ACM competitions in computer science, which included their purpose, who manages them, and who are the competitors [1]. In Slovenia there are three ACM competitions: *Bober*, *RTK* and *UPM*. *Bober* is for primary school children, and it is run actually internationally [2]. The national secondary school competition in computer science is *RTK*. It leads to Central European Olympiad in Informatics (CEOI) and International Olympiad in Informatics (IOI). The last considered completion is *UPM* and it is for university students (*Univerzitetni Programerski Maraton*). The winners of *UPM* participate in the Central Europe Regional Contest (CERC) and later in ACM International Collegiate Programming Contest (ICPC).

After learning about Slovenian competitions, we gathered information about international competitions in a similar way. In particular we analyzed international primary school competitions in computer science, international university competitions in computer science, and online judge systems.

1.1 Bober – an international competition in informatics and computing literacy

As the only primary school level competition in computer science in Slovenia is *Bober*, we compared it with other *Bober* competitions in Europe and worldwide. We found 13 websites about *Bober* competition, which were from Austria, Czech Republic, Estonia, Finland, Germany, Italy, Latvia, Lithuania, the Netherlands, Poland, Slovakia, Switzerland and Ukraine. We focused on four websites, which were the most innovative and appealing. The only website with statistics about competition and its results was the Czech website. It is also the only site with a questionnaire for teachers about evaluation of competition and its organization. However, the most appealing and dynamic site was the German website with a video game *Bober* and its interactive questions. The site is also integrated for all levels of competitions like we wanted to implement ours. The main addition in the Polish website was the discussion board. Downside of the discussion board is that it is in Polish. The most charming was Ukrainian website, which is made especially for children, with its animation and bug like slider [3]. There are many other computer science competitions around the world and they are described in the mentioned analysis.

1.2 UPM – the university programming marathon

The entry point for the university competition analysis [4] was ACM-ICPC website [5]. There we found multiple regional competitions. The *UPM* is part of CERC regional competition. We found out that some competitions does not have website address listed on the CERC website. *UPM* had its own website, with an up to date content. That was good.

We looked at the websites of competitions from Poland, Czech Republic, Portugal, Romania, Ukraine, Benelux, Scandinavia and Russia. Each website has its pros and cons. Pictures and movies of competitions on Polish website were very nice to see, and made website much more pleasant to use. Some sites that were hosting international CERC competition also have tourist information. We decided that this was not jet necessary for *UPM*. Portuguese website is visually pretty appealing. Besides it also has a lot of pictures. Benelux and Scandinavian websites have Facebook page and twitter channel. For now we decided to wait and see how moderation with the website alone will be, and

later we also plan to open profiles on popular social media networks.

1.3 Competing systems

We reviewed some open source judge systems and online judge systems for programming competitions that

are used on Olympiad (RTK in Slovenia) level and on ICPC (UPM in Slovenia) level. We compared the open source judge systems such as DOMjudge, ACM server, Hustoj, NeuoJ and Moodle module, and online judge systems, such as Sphere online judge, Light OJ, Z-Trening, UVa, CodeForces and Putka [6].



Figure 1: Former Bober website for K-12 children.

2 Work

We compared Slovenian and international competitions and presentation of information on the websites. We gained some good ideas and effective solutions for our website, such as logical layout (important information should be visible at all times, which has to be implemented in the layout), there has to be FAQ (Frequently asked questions) and some form of online discussion between the visitors, for example discussion board or LMS (Learning Management System). The most important thing is also the dynamic of the website. Current websites did not have any of this and they were static, sample of which is presented in Figure 1.

The work was organized through regular meetings, which helped us to know all the time what one is doing, where are the problems, to brainstorm the ideas, and to be more motivated to do some work every week.

2.1 Content management system

For the implementation of the website we decided to use an open source CMS Drupal [7], because of its good documentation, online support and module repository.

After making the layout and the template on the paper, we divided content into divisions – menu for the main website and all the sub sites for each competition on Figure 2.

First we needed to learn the Drupal development environment to make an implementation, including new Drupal theme and some modules. Indeed, we used a freely available theme as a starting point to make the development process faster.

In the January we had our website up and running. We filled in the appropriate content for each competition from the former websites and updated some of the information.

Over time we customized the theme to fit our needs and implemented some of our own modules. For example, we added menus and created a separate color scheme for each competition that reflected the color scheme of international competitions. Further, we created a node (news) based gallery with an additional central page. At last but not least, we created module to support presentation of sponsors. The module randomly displays logos of sponsors based on the category of the sponsor.

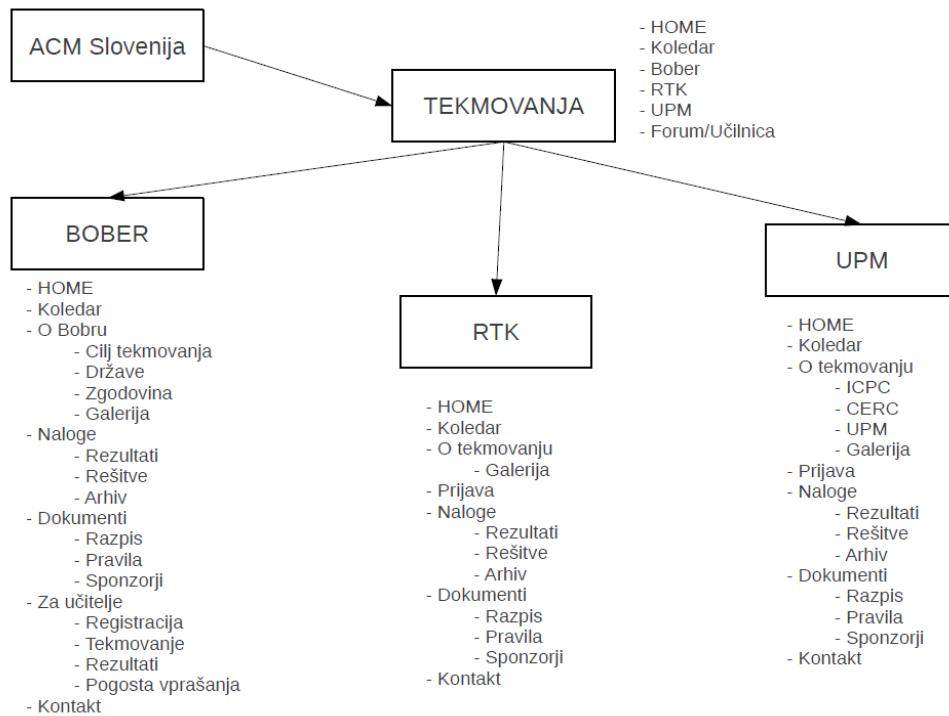


Figure 2: Draft of a menu

2.2 Moderation

After basic content was done, we appointed a moderator for every competition using user permission system.

Their task is to keep the information relevant and interesting. For easier moderation we also made instructions in Slovene on how to moderate [8].

ACM Tekmovanja

Domov Bober RTK UPM Forum

10 Jul The CEOI 2012 Online Competition

We are proud to host the 19th CEOI in Hungary this year. And, like in previous years, students and other interested persons may take part in the CEOI competition through the Internet.

Like +1 Tweet

[Preberi več](#)

14 Jun Ekipa za CEOI je izbrana!

V preteklih dneh je bila izbrana ekipa, ki bo zastopala Slovenijo na srednje-evropski olimpijadi iz računalništva in informatike (CEOI), ki bo od 7. do 13. julija 2012 v Tati na Madžarskem.

Like +1 Tweet

[Preberi več](#)

14 Jun Poletna šola FRI tudi za študente!

Letos bo Fakulteta za računalništvo in informatiko že šestič zapored v času šolskih počitnic izvedla brezplačne delavnice Poletne šole FRI. Namenjene so srednješolcem in študentom, ki želijo izpopolniti in nadgraditi svoje znanje s področja računalništva, informatike in razvoja aplikacij. Na FRI so pripravili devet delavnic Poletne šole FRI, pet delavnic za dijake in štiri za študente.

Like +1 Tweet

Prihajajoči dogodki

- UPM – 3. kolo četrtek, 11. Oktober 2012 (Cel dan)
- UPM – Finale sobota, 20. Oktober 2012 (Cel dan)
- Šolsko tekmovanje torek, 13. November 2012 - 8:00

Organizatorji

Univerza v Ljubljani
Fakulteta za računalništvo in informatiko

Univerza v Ljubljani
Fakulteta za matematiko in fiziko

Figure 3: First page on ACM competitions website.

3 Results

The result of our project is an integrated website for Slovenian ACM competitions <http://tekmovanja.acm.si/>, where each competition has its own color scheme, logo, and of course content. On the first page are aggregated news from competitions as seen on Figure 3. There is also RSS feed offered.

When one chooses a particular competitions site, (s)he gets the menu with the history and current results,

information about the competition, who the competition is for, and additional information one might need.

Further, each competition also has a contact form that can be used to send further inquiries on the competition. Besides, in the header of each competition are also links to the judge system and to the international level competitions.

As an example, see the new Bober sub site in Figure 4 and compare it with the old from Figure 1. Other competitions have similar pages.

Figure 4: The new Bober sub site.

All competitions have moderators and moderation is made very simple, so we are confident that this website will be well accepted.

Literature

- [1] ACM (Association for Computing Machinery), <http://www.acm.org/>
- [2] Bebras, International contest on Informatics and Computer Fluency, <http://www.bebas.org/>
- [3] N. Kristan: Analysis of foreign primary school competitions, https://lusy.fri.uni-lj.si/redmine/attachments/download/133/pregled_natasa_kristan.pdf
- [4] B. Pikel: Analysis of university competitions, https://lusy.fri.uni-lj.si/redmine/attachments/download/135/ACM_tekmovanja_za_univerze.docx
- [5] ACM-ICPC web site, <http://icpc.baylor.edu/>
- [6] Ž. Ham: Analysis of online judge systems, <https://lusy.fri.uni-lj.si/redmine/attachments/download/134/pregled.pdf>
- [7] Open source CMS Drupal, <http://drupal.org/>
- [8] N. Kristan, Instructions for moderators, https://lusy.fri.uni-lj.si/redmine/attachments/download/294/Navodila_za_uporabo_sistema_Drupal_moderatorji.pdf