Olympic NEU

Report of Assignment of JSP Servlet Tech. Course – Part 2

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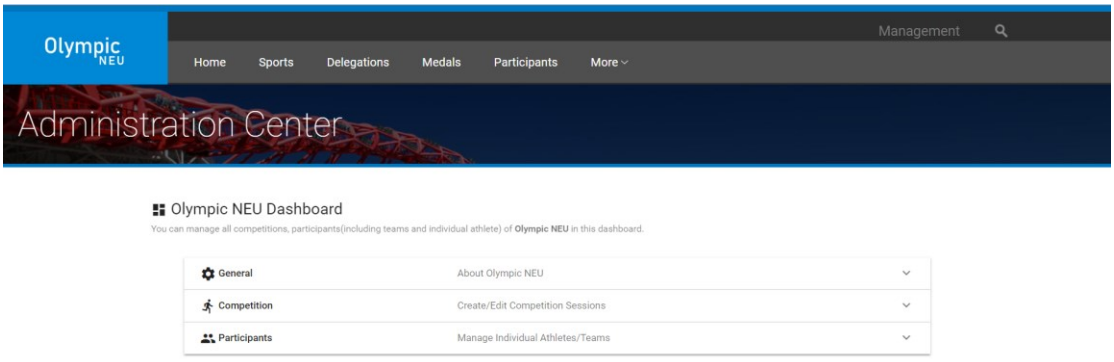
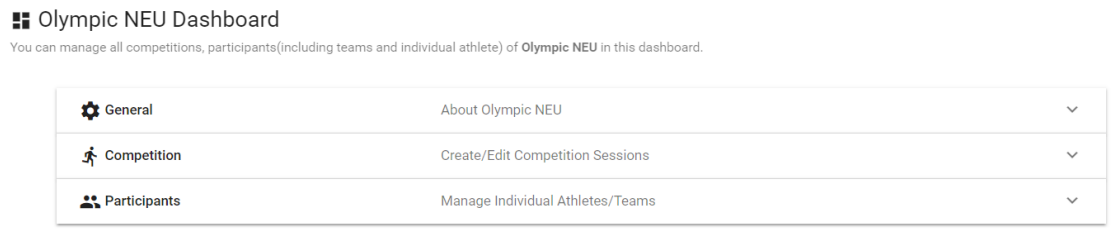
Design Decisions for Part 2

(1) Administrator Log-in and Manipulations

Clean Options



ADMINISTRATION PAGE OVERVIEW

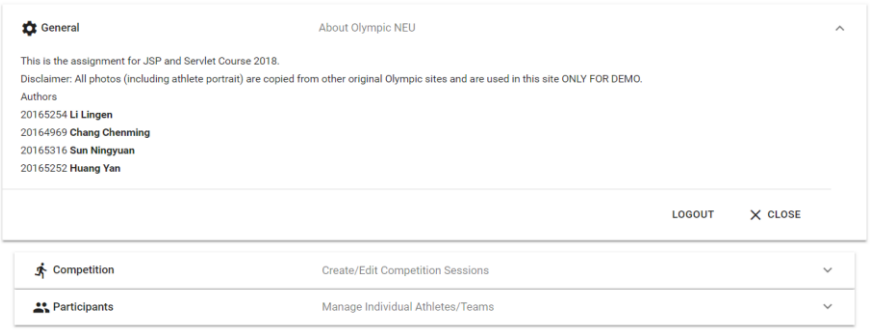


OPTIONS FOR ADMINISTRATORS

General Page Showing Credits

Three options are shown. The first one, general, shows the information of all the developers of our team.

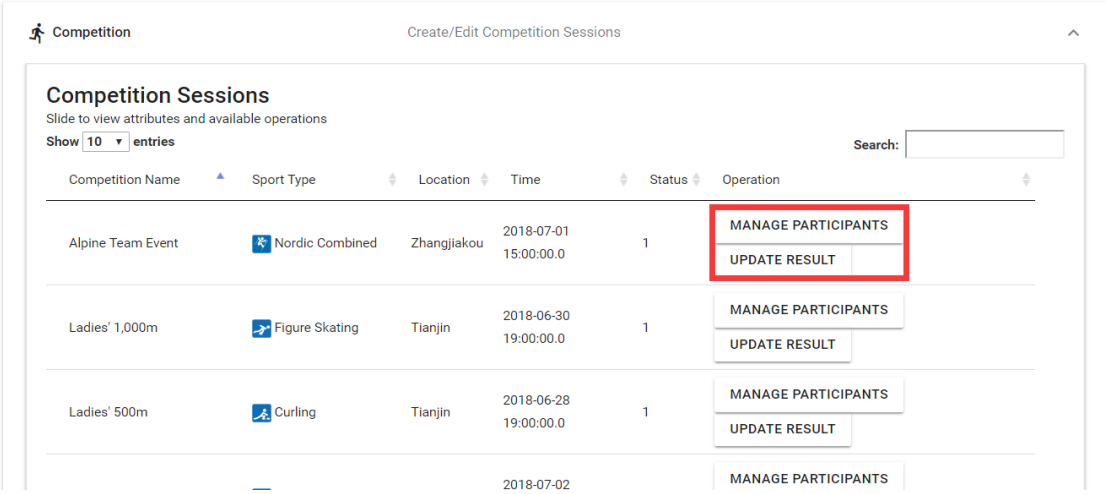
On clicking, the panel will be enlarged, showing the detailed information.



GENERAL

Competition Update

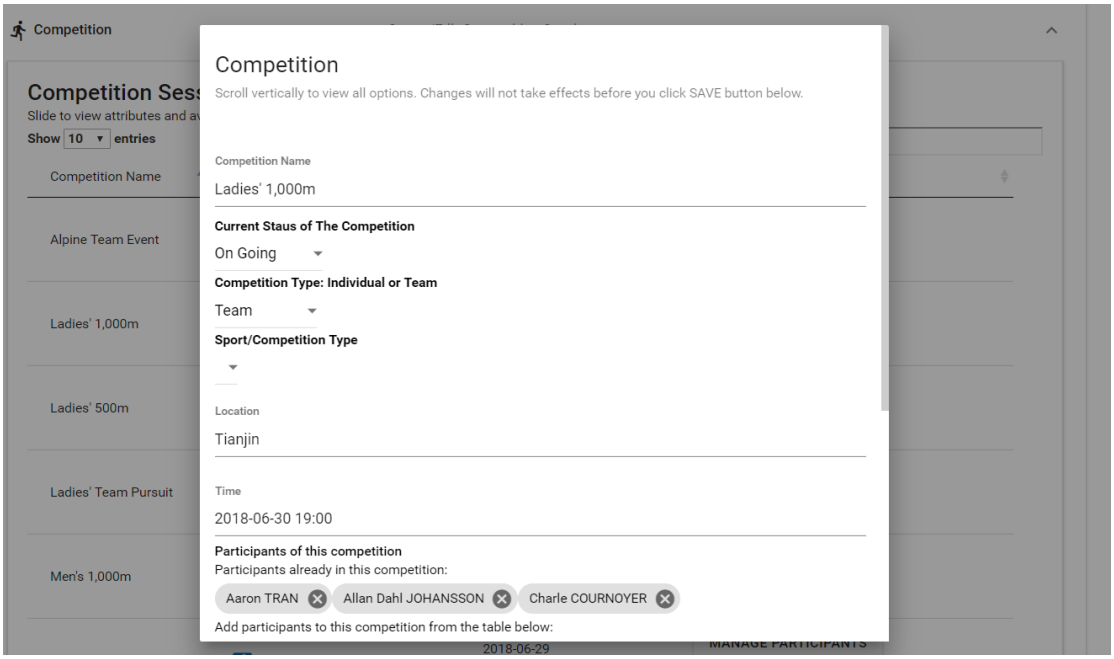
Similarly, clicking on other panels allows administrator to update relevant information. As shown below, this is the administration panel for the competitions.



ADMINISTRATION PANEL FOR COMPETITIONS

Further Manipulation

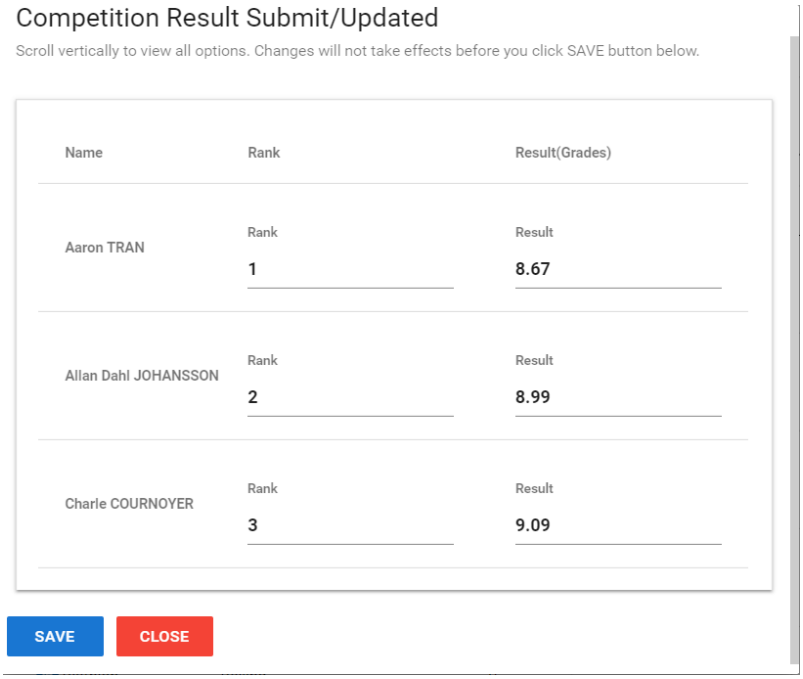
Clicking the marked-out area's buttons, we can either manage participants or update results with a newly shown panel for further manipulation. This idea eliminates the unnecessary calling for a new page, instead the darkened background and the new panel help users concentrate and the manipulation is easy.



COMPETITION MANAGEMENT PANEL

Update Competition Result

We use a concise form to log all the detailed result and rank for each participant.

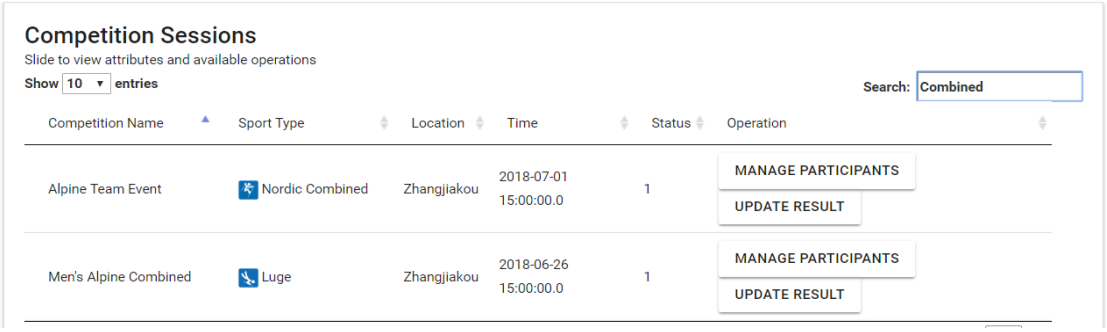


COMPETITION RESULT LOGGING PANEL

Only if the user taps the save button will the update be saved in the database.

Neat Searching Tool

The magic of this searching tool is that it has combined all the information to be searched, for example if you have input combined, the output entries not only contain the sport type of 'Nordic Combined', but also the competition that named 'Men's Alpine Combined'.

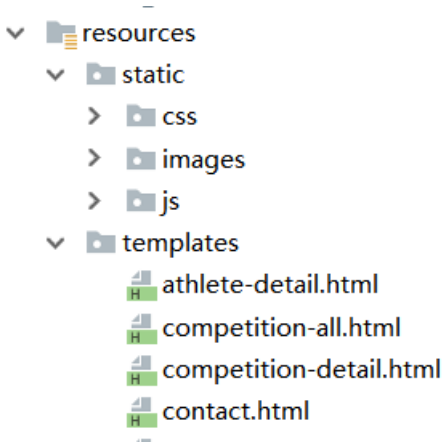


SEARCHING TOOL

Innovative features

(1) Use of Spring framework

In order to deploy this website, we try to combine the front-end into the back-end server. Therefore, we don't need another server like Tomcat to deploy. With the Spring Boot server, we need to put the pages resources into resource folder. After that we only need to write a mapper for the static pages.



PROJECT STRUCTURE

```
@Controller
public class FrontEndController {
    @RequestMapping("/")
    public String index() {
        return "index";
    }
    @RequestMapping("**/footer.html")
    public String footer() {
        return "footer";
    }
    @RequestMapping("/athlete/{name}")
    public String athlete(@PathVariable String name, Model model) {
        model.addAttribute("name",name);
        return "athlete-detail";
    }
}
```

(2) Use Spring Boot framework

Because Spring is a complicated framework, we used Spring Boot framework to auto deploy the Spring application.

(3) Use of Spring data JPA

The Spring Data JPA deals with enhanced support for JPA based data access layers. It makes it easier to build Spring-powered applications that use data access technologies.

The first advantage of JPA is we don't need to write DDL scripts. We only need to design the logical structure of entities in our project.

The second advantage of JPA is we don't need to write DML scripts or SQL queries. We can just operate Java Object to load and save data with database.

(4) Use of global constants

We created a utility class to store the global constant which we can easy to access and keep uniform in this application.

(5) Use token to identify the user

We use HS256 algorithm to create a token key and send it to the frontend. The frontend will keep the key and put it into request data to let the backend check and identify if the user is administrator.

```
private static final byte[] SECRET = "3d990d2276917dfac04467df11fff26d".getBytes();
private static final JWSHeader header = new JWSHeader(JWSAlgorithm.HS256, JOSEObjectType.JWT, null, null, null, null, null, null, null, null, null, null);
public static String createToken(Map<String, Object> payload) {
```

```
4.      String tokenString = null;
5.      JWSObject jwsObject = new JWSObject(header, new Payload(new JSONObject(p
    ayload)));
6.      try {
7.          // jwsObject do the HMAC sign
8.          jwsObject.sign(new MACSigner(SECRET));
9.          tokenString = jwsObject.serialize();
10.     } catch (JOSEException e) {
11.         System.err.println("Signature failed:" + e.getMessage());
12.         e.printStackTrace();
13.     }
14.     return tokenString;
15. }
```

CODE SNIPPET FOR JWT WEB TOKEN

(6) Use of *Thymeleaf* template engine

Because we use Mapping to load page, so if we want to pass parameters by path we should use a template engine to connect Java and static pages.

(7) Use of MVVM framework Vue.js

In the administration dashboard, MVVM frontend framework is used to simplify the data reaction in this section. If we use traditional jQuery only in this page the render work when data updated will become much more complex.

(8) Use of Ajax

In many pages we have used Ajax to provide a better user experience by request the data needed instead of refreshing the whole page.

Problem

(1) The performance of JPA

Because the mapped relations in our entities logical structure, it's will take more time in query operation with JPA.

With this problem we try to use lazy load and eager load to improve the performance. But there are still few slow queries in our project.

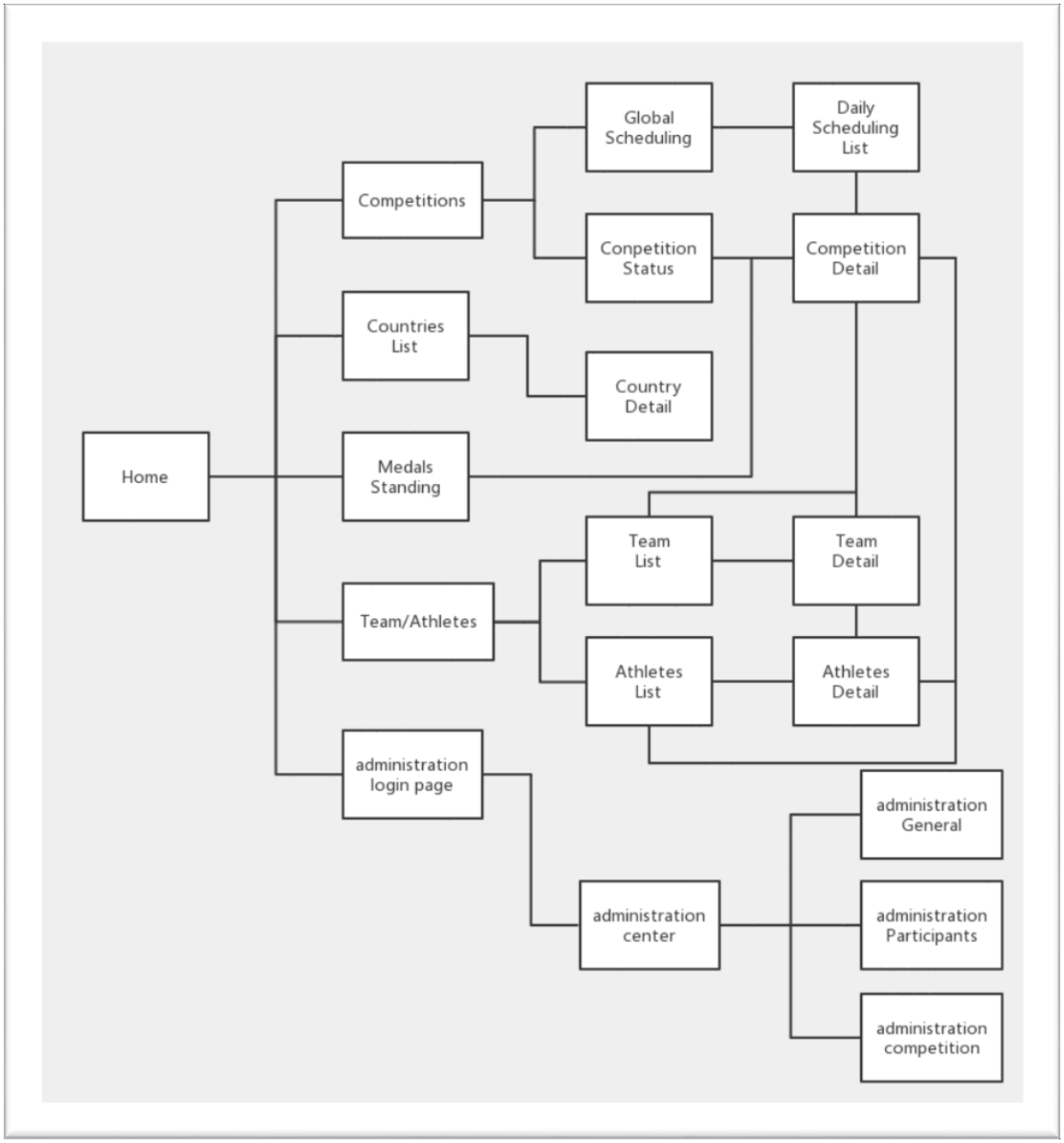
(2) Render work of frontend page

Append HTML codes to page is not a good choice. To simplify the work of rendering after receiving data from server in Ajax, a simple template render function is implemented in JavaScript.

```
// Compile templates to code in HTML5
function compileTemplate(template, data) {
    for(var name in data){
```

```
            // RegExp multiple match
            template = template.replace(RegExp('__'+ name +'__','g'), data[name]);
        }
        return template;
    }
```

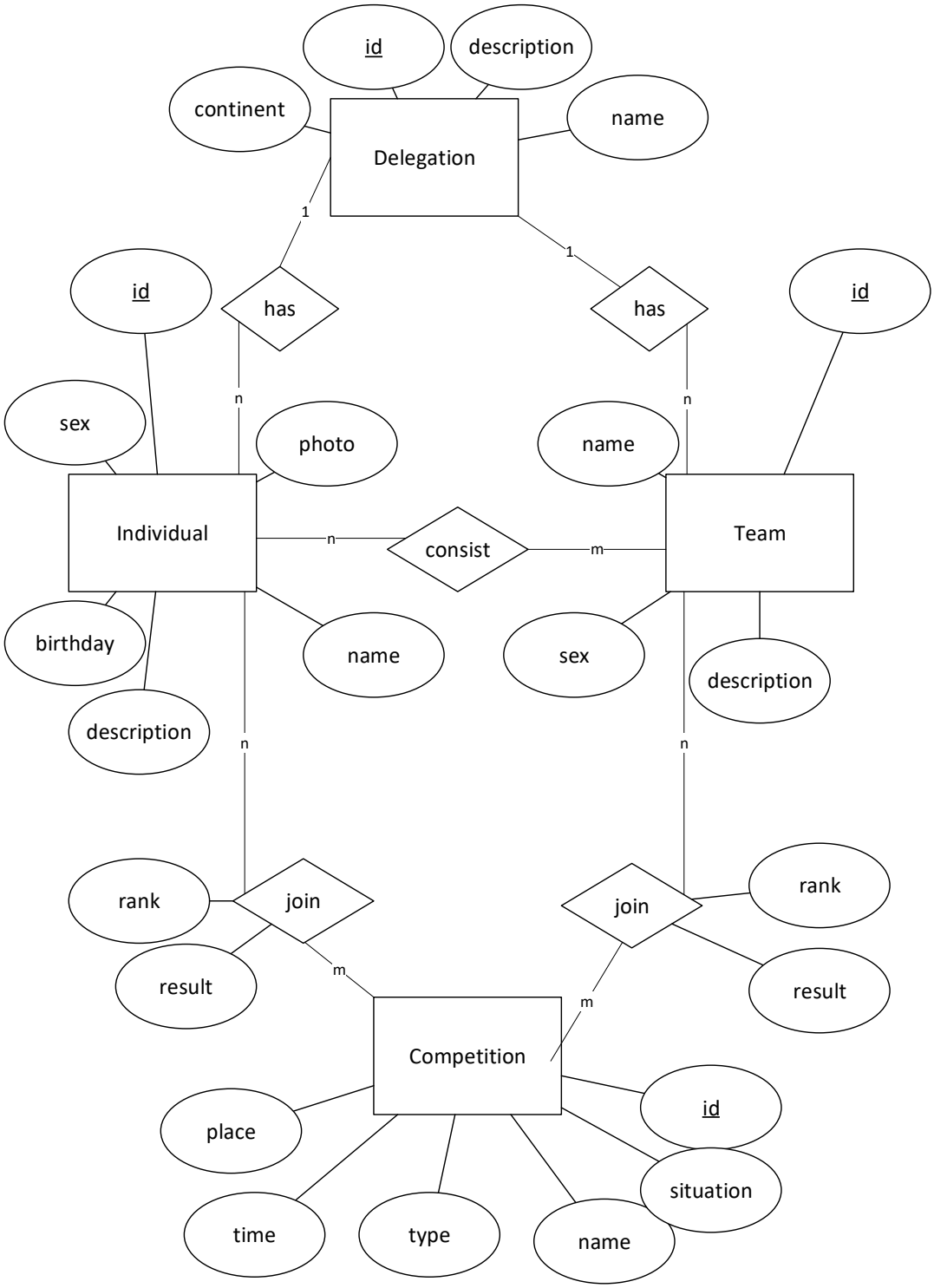
Map



SITE MAP

Database design

This is the ER diagram for our site.



ER DIAGRAM

Table structures (normalized):

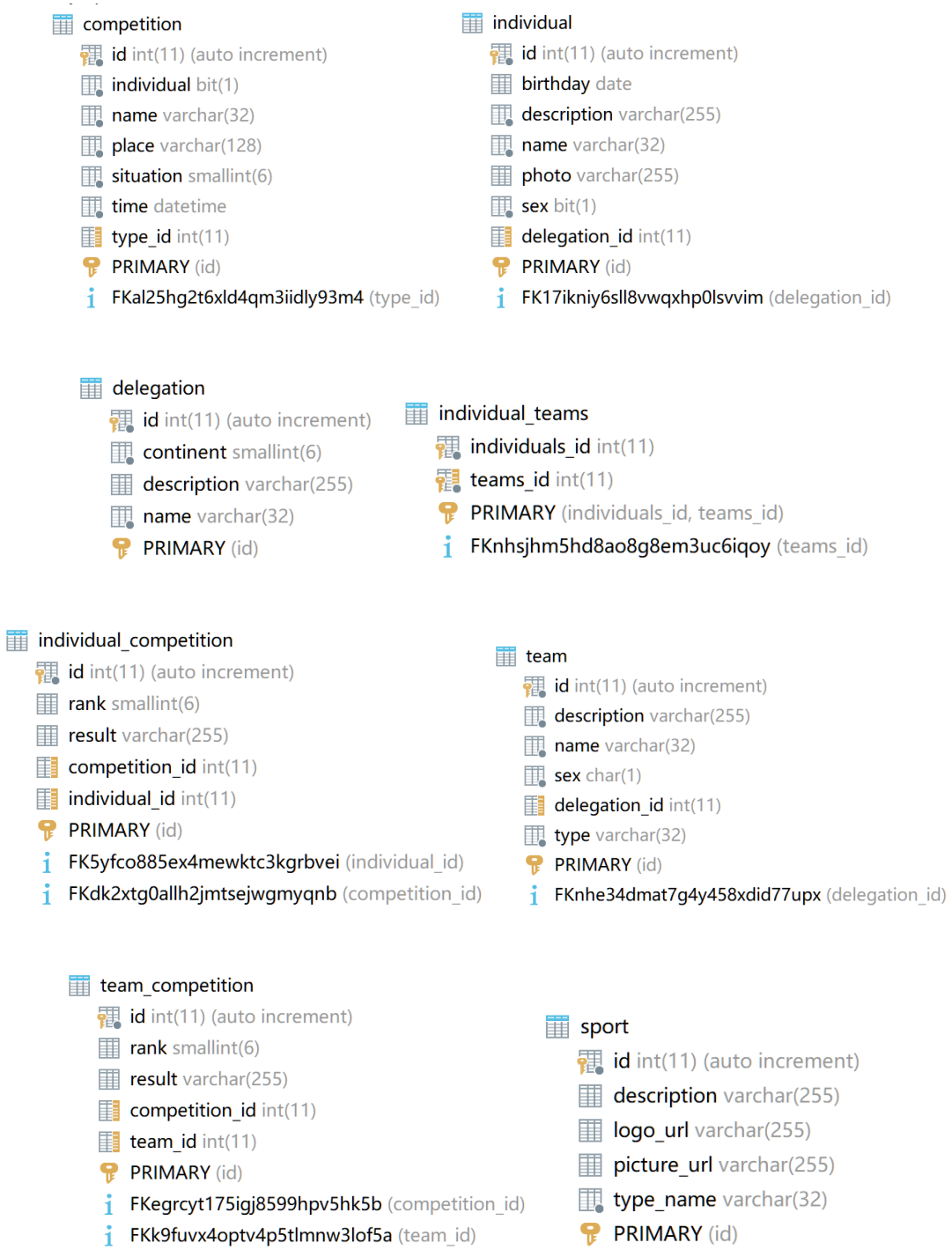


TABLE STRUCTURES

The DDL (Construct SQL) is in the appendix.

Contribution Table of Part 2 of the project

It's hard to tell who has written which file because almost every file contains everyone's effort. In this table, contributions are listed by what thing he or she has done. And this table is only for reference.

STUDENT ID	NAME	CONTRIBUTION
20164969	Chang Chenming	Database ER Design
		Spring framework initialization and configuration
		Create the entity classes for JPA
		Implement the authorization system with JWT
		Implement the request/response framework of backend
		Implement the request controller to respond request from admin user
		Implement the frontend route and data inject
20165254	Li Lingen	Administration dashboard design
		Vue MVVM module import (To admin dashboard)
		Material Design Style Framework import
		Front-end token validation
		Athletes / Teams dynamic add / delete in admin dashboard
		Ajax interaction of every page
		Filter page
		Write the part of design document
20165252	Huang Yan	Design Data relationship and ER diagram
		Design team detail page, individual detail page
		Add demo data of teams, athletes and countries into database
		Design participants form in administrator page
		Write the part of design document
20165316	Sun NingYuan	Database Design
		Front-end data injection
		A part of front-end page design
		Write the part of design document
		Add demo data of teams, athletes and countries into database

CONTRIBUTION TABLE

Appendix

The database construct SQL

```
--
-- Table structure for table `competition`
--

DROP TABLE IF EXISTS `competition`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `competition` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `individual` bit(1) NOT NULL,
  `name` varchar(32) NOT NULL,
  `place` varchar(128) NOT NULL,
  `situation` smallint(6) NOT NULL,
  `time` datetime NOT NULL,
  `type_id` int(11) DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `FKal25hg2t6xld4qm3iidly93m4` (`type_id`),
  CONSTRAINT `FKal25hg2t6xld4qm3iidly93m4` FOREIGN KEY (`type_id`)
REFERENCES `sport` (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=20 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `competition_team_competitions`
--

DROP TABLE IF EXISTS `competition_team_competitions`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `competition_team_competitions` (
  `competition_id` int(11) NOT NULL,
  `team_competitions_id` int(11) NOT NULL,
  PRIMARY KEY (`competition_id`,`team_competitions_id`),
  UNIQUE KEY `UK_kuymsu1ubvghk8hpxo37xt8hm` (`team_competitions_id`),
```

```
  CONSTRAINT `FK340ttg3x7c2ssbgouendtbtvq` FOREIGN KEY
(`team_competitions_id`) REFERENCES `team_competition` (`id`),
  CONSTRAINT `FK5274rdror2bqpq6jvlnva8emm` FOREIGN KEY
(`competition_id`) REFERENCES `competition` (`id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `delegation`
--

DROP TABLE IF EXISTS `delegation`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `delegation` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `continent` smallint(6) NOT NULL,
  `description` varchar(255) DEFAULT NULL,
  `name` varchar(32) NOT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=35 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `individual`
--

DROP TABLE IF EXISTS `individual`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `individual` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `birthday` date DEFAULT NULL,
  `description` varchar(255) NOT NULL,
  `name` varchar(32) NOT NULL,
  `photo` varchar(255) DEFAULT NULL,
  `sex` bit(1) NOT NULL,
  `delegation_id` int(11) DEFAULT NULL,
```

```
  PRIMARY KEY (`id`),
  KEY `FK17ikniy6sll8vwqxhp0lsvvim` (`delegation_id`),
  CONSTRAINT `FK17ikniy6sll8vwqxhp0lsvvim` FOREIGN KEY (`delegation_id`)
REFERENCES `delegation` (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=40 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `individual_competition`
--

DROP TABLE IF EXISTS `individual_competition`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `individual_competition` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `rank` smallint(6) DEFAULT NULL,
  `result` varchar(255) DEFAULT NULL,
  `competition_id` int(11) DEFAULT NULL,
  `individual_id` int(11) DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `FKdk2xtg0allh2jmtsejwgmyqnb` (`competition_id`),
  KEY `FK5yfco885ex4mewktc3kgrbvei` (`individual_id`),
  CONSTRAINT `FK5yfco885ex4mewktc3kgrbvei` FOREIGN KEY (`individual_id`)
REFERENCES `individual` (`id`),
  CONSTRAINT `FKdk2xtg0allh2jmtsejwgmyqnb` FOREIGN KEY
(`competition_id`) REFERENCES `competition` (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=65 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `individual_teams`
--

DROP TABLE IF EXISTS `individual_teams`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `individual_teams` (
```

```
  `individuals_id` int(11) NOT NULL,
  `teams_id` int(11) NOT NULL,
  PRIMARY KEY (`individuals_id`,`teams_id`),
  KEY `FKnhsjhm5hd8ao8g8em3uc6iqoy` (`teams_id`),
  CONSTRAINT `FKnhsjhm5hd8ao8g8em3uc6iqoy` FOREIGN KEY (`teams_id`)
REFERENCES `team` (`id`),
  CONSTRAINT `FKp32oxkoh19u5ov5dymk7uas5n` FOREIGN KEY
(`individuals_id`) REFERENCES `individual` (`id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `sport`
--

DROP TABLE IF EXISTS `sport`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `sport` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `description` varchar(255) DEFAULT NULL,
  `logo_url` varchar(255) DEFAULT NULL,
  `picture_url` varchar(255) DEFAULT NULL,
  `type_name` varchar(32) NOT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=16 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `team`
--

DROP TABLE IF EXISTS `team`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `team` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `description` varchar(255) NOT NULL,
```

```
  `name` varchar(64) NOT NULL,
  `sex` char(1) NOT NULL,
  `delegation_id` int(11) DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `FKnhe34dmat7g4y458xdid77upx` (`delegation_id`),
  CONSTRAINT `FKnhe34dmat7g4y458xdid77upx` FOREIGN KEY (`delegation_id`)
REFERENCES `delegation` (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=13 DEFAULT CHARSET=latin1;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Table structure for table `team_competition`
--

DROP TABLE IF EXISTS `team_competition`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `team_competition` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `rank` smallint(6) DEFAULT NULL,
  `result` varchar(255) DEFAULT NULL,
  `competition_id` int(11) DEFAULT NULL,
  `team_id` int(11) DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `FKegrcyt175igj8599hpv5hk5b` (`competition_id`),
  KEY `FKk9fuvx4optv4p5tlmnw3lof5a` (`team_id`),
  CONSTRAINT `FKegrcyt175igj8599hpv5hk5b` FOREIGN KEY (`competition_id`)
REFERENCES `competition` (`id`),
  CONSTRAINT `FKk9fuvx4optv4p5tlmnw3lof5a` FOREIGN KEY (`team_id`)
REFERENCES `team` (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=69 DEFAULT CHARSET=latin1;
```