



PA181

Term Project

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About

- term project
- team project
- cloud native
- something useful



Idea

- system for user self-testing
- users are able to test themselves
- users can add new tests
- multilingual
- good for exams preparation



Work Division

■ Jan Ondruch

- specifications
- design
- testing

■ Jiří Čechák

- design
- frontend
- testing
- bug fixing

■ Tadeáš Pavlík

- analysis
- design
- testing

Work Division

- Adrián Tóth
 - configuration
 - architecture
 - deployment
 - documentation
 - presentation
- Václav Stehlík
 - backend
 - interconnection of backend & frontend
 - troubleshooting
 - bug fixing

Used Tools & Technologies

Technologies:

- IBM Cloud
- GitHub
- Travis CI

Tools:

- IBM Cloud DevOps Toolchain
- ASP.NET
- React
- Material-UI

Requirements

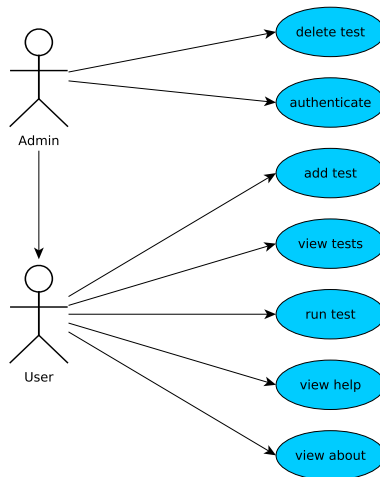


Figure: Use Case Diagram

Application Initialization

- created one private repository
 - hosted on GitHub
- inspired by IBM ASP.NET *'HelloWorld'*¹
- created project skeleton
 - ASP.NET Core Web API (*webapi*) - the main structure
 - Class library (*classlib*) - several support projects
- configured deployment
 - before the development itself
 - on a clean *'HelloWorld'* application
- configured automation pipeline
 - IBM Cloud DevOps Toolchain

¹github.com/IBM-Cloud/aspnet-core-helloworld



Application Implementation

Frontend:

- Material UI components
- connected to the API
- supporting any mode
 - phone
 - tablet
 - desktop

Backend:

- Model–View–Controller
- multitier architecture
 - API
 - entities
 - repositories
 - services

Application Deployment

Our work looked like this:

■ Manual

- 1 Change code in a local repository
- 2 Commit changes in the local repository
- 3 Update of the remote repository

■ Automated

- 4 Test the application
- 5 Build the application from source
- 6 Deploy the built application
- 7 Create a release

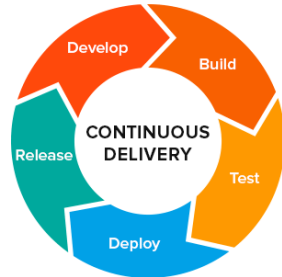


Figure: Continuous Delivery



Toolchain

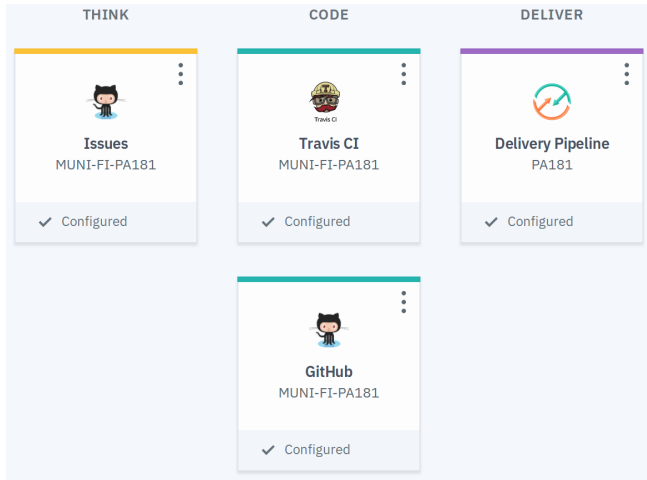


Figure: IBM Cloud DevOps Toolchain

Flow




Figure: Flow Diagram




Examples

The following screenshots illustrate our application.


Example 1

[PREP 4 TESTS](#) [TESTS](#) [ADD NEW TEST](#) [HELP](#) [ABOUT](#) [LOGIN](#) 




Geology

Number of questions: **3**
Description: **General knowledge of geology.**




Mathematics

Number of questions: **3**
Description: **General knowledge of mathematics.**



Informatics

Number of questions: **3**
Description: **General knowledge of informatics.**



Chemistry

Number of questions: **3**
Description: **General knowledge of chemistry.**

Figure: list of available tests



Example 2

PREP 4 TESTS

TESTS

ADD NEW TEST

HELP

ABOUT

LOGIN

$2 + 2 = ?$

Question 1 / 3

MENU

1

4

2

9

PREV

NEXT

Wrongly answered questions:

1

00:00:18

Correct: 0 / 3 (0%)

Description:

Addition


Additional information:

So funny.

Figure: incorrect answer



Example 3

[PREP 4 TESTS](#) [TESTS](#) [ADD NEW TEST](#) [HELP](#) [ABOUT](#) [LOGIN](#) 

$2 * 2 = ?$

Question 2 / 3 [MENU](#)

3

1

2

4

PREV

NEXT

Wrongly answered questions:

1

00:00:52

Correct: 1 / 3 (33.3%)

Description:

Multiplication

Additional information:

Difficult?

Figure: correct answer

Example 4

PREP 4 TESTS


TESTS

ADD NEW TEST

HELP

ABOUT

LOGIN



2 - 2 = ?

Question 3 / 3

4

2

0

PREV

EVALUATE

NEXT

Wrongly answered questions:

1

00:01:31

ect: 1 / 3 (33.3%)

Description:

Subtraction

Hide info

Hide statistics

Reset timer

Delete statistics

Start over

Figure: dropdown menu




Example 5

The screenshot shows a web application interface. At the top is a blue navigation bar with the text 'PREP 4 TESTS' on the left, and 'TESTS', 'ADD NEW TEST', 'HELP', 'ABOUT', 'LOGIN', and a UK flag icon on the right. Below the navigation bar is a white login form. The form contains two input fields: 'Username' and 'Password'. To the right of the 'Password' field is a blue button with the text 'LOGIN' in white.

Figure: login

Example 6

PREP 4 TESTS
TESTS
ADD NEW TEST
HELP
ABOUT
LOGIN


New test

Name *

Language *

Test as JSON file *

UPLOAD FILE

Description

* Required

SUBMIT

Figure: add a new test

Example 7

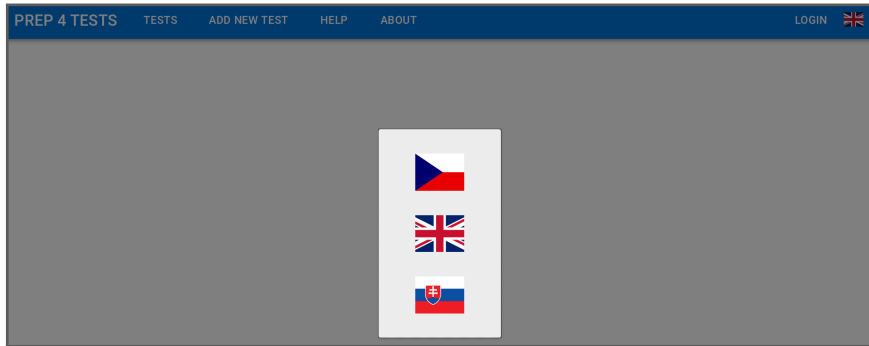



Figure: language selection



Example 8

[PREP 4 TESTS](#) [TESTS](#) [ADD NEW TEST](#) [HELP](#) [ABOUT](#) [LOGIN](#) 

Help


Test as JSON file

```
[
  {
    "text": "string",
    "description": "string",
    "afterSubmitFeedback": "string",
    "answers": [
      {
        "text": "string",
        "isCorrect": true
      }
    ]
  }
]
```

- **text** - Question
- **description** - Description
- **afterSubmitFeedback** - Additional information to be displayed after the answers have been evaluated.
- **answers** - Answers
 - **text** - Answer
 - **isCorrect** - true (Correct) / false (Incorrect)

Figure: help

Example 9

PREP 4 TESTSTESTSADD NEW TESTHELPABOUTLOGIN

About

Title:

Semestrální projekt pro předmět PA181 (2019)

Authors:

Adrián Tóth, Tadeáš Pavlík, Jiří Čechák, Václav Stehlík, Jan Ondruch

Description:

Application for user self-testing.

Source:

<https://github.com/europ/MUNI-FI-PA181>

License:

<https://github.com/europ/MUNI-FI-PA181/blob/master/LICENSE>

Figure: about



Thank you for your attention!