DD-v0.1

Francesco Spangaro - Tosetti Luca - Francesco Riccardi

07 January 2024

POLITECNICO
MILANO 1863

Contents

1 Introduction

1.1 Purpose

The purpose of this document is to provide an exhausting and implementative description of the platform that will be implemented (CKB platform). In particular the document is focused on the description of the architectural styles and decisions that will be adopted, the modules that compose the platform and their interfaces. The document will contains also several details regarding the deployment choices, the runtime view of the core functionalites of the platform that will be used in it. The document contains some mockups of the user interface design. The document also covers the implementation, integration and testing processes required to implement correctly the CKB platform.

1.2 Scope

CodeKataBattle (CKB) is a platform which aims to give to Educators an easy-to-use experience, and let them propose homework and/or lessons in a new and fresh way. The main goal of the platform is to give the Students the possibility to improve and acquire new software developing skills by particpating to several battles in as many tournaments. The platform let Educators of the Students to create such tournaments and battles within them in order to challenge the Students to upload the best possible solution to the battle's problem. That solution will be then automatically evaluated by the platform which will give it a score, and eventually even by the Educator who created the battle, and will be associated to it a proper score. The platform also allow Educators to add several recognition badges for the work done by the students. This badges can be personalized by the Educators themselves.

From the architectural point of view we have decided to adopt a 4-Tier Client-Server architecture combined with a MSA server side, in addition to a MVC software architectural choice.

1.3 Definitions, acronyms, abbreviations

1.3.1 Definitions

Term	Definition
4-Tier Architecture	

Term	Definition

Presentation Layer

Term	Definition

WebServer Layer

→ The third layer of the 4-Tier architecture. It takes care of implementing the real application logic that

Term	Definition

Data Layer

Term	Definition
Microservice architecture	

Term	Definition
	Model-View-Controller

Term	Definition
View	

Term	Definition
Controller	

Term	Definition
Model	

1.3.2 Acronyms

Acronym	Meaning
MSA	→ MicroServices Architecture
MVC	→ Model-View-Controller
RASD	→ Requirement Analysis and Specification Document

Acronym	Meaning
DD	→ Design Document
CKB	→ CodeKataBattle
	→

1.3.3 Abbreviations

Abbreviation	Meaning
e.g.	→ Exempli gratia, latin phrase meaning "for example".
	→
	→
	→
	→

1.4 Revision history

- **Placeholder data**: version 1.0

1.5 Reference documents

UML official specification → `https://www.omg.org/spec/UML`

Sequence diagrams specification → `https://www.uml-diagrams.org/sequence-diagrams.html`

Component diagrams specification → `https://creately.com/blog/software-teams/component-diagram-tutorial/`

Deployment diagrams specification → `https://pubs.opengroup.org/architecture/archimate32-doc.singlepage/`

1.6 Document structure

- ***Section 1: Introduction***
  This section offers a brief description of the problem and the platform/application

that will be developed in order to resolve it. It describes the major purpose of this document, a very brief recap of the domain which is described in detail in the RASD document. In addition, in this section are inserted definitions, acronyms and abbreviations used in the document, its revision history and refereced documents or web pages.

- ***Section 2: Architectural Design***
  This section is the main part of the document. It describes the architectures used to realize the platform, the CKB platform's components, its interfaces, its deployment structure and finally its runtime behaviour. All these aspects are described through several diagrams such as: component diagrams, class diagrams, deployment diagrams and other generic diagrams which are used to give a representation of main and most important features of the platform.

- ***Section 3: User interface design***
  This section describes the user interface design of the platform. It contains several mockups of the interface that the Educators and Students will find when they access to the platform. The presented mockups refers to the client-side experience throught an appropriate browser application.

- ***Section 4: Requirements traceability***
  This section describe the connection between the RASD and DD document, by providing a complete map of the requirements and goals expressed in the RASD to the modules presented in this document.

- ***Section 5: Implementation, Integration & Test plan***
  This section describes the plan followed for implementing, testing and integrating the platform's components, the order in which these operations are performed and what they generate.

- ***Section 6: Effort spent***
  This section contains all the information about the time spent by each group member in order to complete this document and its division by each section of the document.

2 Architectural Design

2.1 Overview: High-level components and interactions

2.2 Component view

2.3 Deployment view

2.4 Component interfaces

2.5 Runtime view

2.6 Selected architectural styles and patterns

2.7 Other design decisions

3 User Interface Design

4 Requirements traceability

5 Implementation, Integration & Test plan

6 Effort Spent

7 References