



Bilkent University

Department of Computer Engineering

Senior Design Project

QandA

Low Level Design Report

Rıdvan Çelik, Solehjon Ruziboev, Ulugbek Irmatov

Supervisor: Uğur Doğrusöz

Jury Members: Fazlı Can and Çiğdem Gündüz Demir

Note: Project name has been changed from BFSP to QandA.

Feb 12, 2018

This report is submitted to the Department of Computer Engineering of Bilkent University in partial fulfillment of the requirements of the Senior Design Project course CS491/2.

1. Introduction	1
1.1 Object design trade-offs	2
1.1.1 Usability - Utility	2
1.1.2 Security - Performance	2
1.2 Interface documentation guidelines	2
1.3 Engineering standards (e.g., UML and IEEE)	2
1.4 Definitions, acronyms, and abbreviations	3
2. Class Interfaces	3
3. Glossary	15
4. References	16

1. Introduction

QandA is question and answer platform for Bilkent courses developed on MERN stack. MERN - MongoDB, Express.js, React.js, Node.js.

This report aims to provide information about low level design of QandA project. We will discuss object design trades-offs, engineering standards used for the project, list detailed information about class interfaces, define several definitions and acronyms used in the report.

1.1 Object design trade-offs

1.1.1 Usability - Utility

We plan to do our best to balance usefulness and ease of use. The system should have several useful functionalities for users. We will prefer ease of use over too many functionalities though. Since our main goal is to provide answers, we can leave out some secondary functionalities if they worsen usability.

1.1.2 Security - Performance

We will prioritize security over performance when necessary. We still plan to make high-performing system but when we have to do extra operations to ensure security we will do it.

1.2 Interface documentation guidelines

Class Name	The name of the class
Package Name	The name of the package which includes the class
Description	A brief description of the class
Attributes	Data members of the class
Operations	The functions provided by the class

1.3 Engineering standards (e.g., UML and IEEE)

The project follows IEEE standards. All the UML diagrams developed for previous reports are used during the implementation phase of the project. Open source AirBnB JavaScript guidelines are followed as well.

1.4 Definitions, acronyms, and abbreviations

React.js: UI library developed by Facebook.

MongoDB: NoSQL database

Express: A Node.js framework

Elasticsearch: RESTful search and analytics engine capable of solving a growing number of use cases [1].

2. Class Interfaces

React.js has component lifecycle methods:

- `ComponentWillMount()`
- `ComponentWillReceiveProps()`
- `ShouldComponentUpdate()`
- `ComponentWillUpdate()`
- `ComponentDidUpdate()`
- `ComponentWillUnmount()`
- `ComponentDidMount()`

Each React component can implement any methods above but they don't have to implement all of them.

Class Name	Answer
Package Name	Views
Description	A component with input text and submit button that is created when user presses answer button on a question
Attributes	String inputText Image image String tag
Operations	render() onClick()

Class Name	Search
Package Name	Views
Description	Helps users to navigate in the website by sorting out the data using user's input
Attributes	String inputText
Operations	render() onChange()

Class Name	Suggestions
Package Name	Views
Description	The component shows the current suggestions according to input in the search section
Attributes	List suggestionItems Component SuggestionItem
Operations	render() setState()

Class Name	SuggestionItem
Package Name	Views

Description	Picks out items which are related to the text written by user with the help of Elasticsearch [1]
Attributes	String text
Operations	render() setState()

Class Name	Button
Package Name	Views
Description	In React we can reuse components. So, all types of buttons such as login, submit, etc. will be instances of this class.
Attributes	String text String cssClass Function onClick()
Operations	onclick() render()

Class Name	LoginForm
Package Name	Views
Description	The login form consisting of username and password fields
Attributes	String studentID String password
Operations	accessAllowed(studentID, password) render()

Class Name	SignupForm
Package Name	Views
Description	The form used to register a student which consists of full name, student ID, email, password
Attributes	String name

	String studentID String email String password
Operations	register(name, studentID, email, password) render()

Class Name	AskQuestionPanel
Package Name	Views
Description	This component appears when user presses ask question button.
Attributes	String question Image photo
Operations	submit() render() setState()

Class Name	Header
Package Name	Views
Description	The container for the components in the header area of the website such as search bar, profile, ask question button
Attributes	Component Search List<Button>
Operations	render()

Class Name	Profile
Package Name	Views
Description	Shows users' profile
Attributes	Image image int questions int answers int
Operations	

Class Name	Settings
Package Name	Views
Description	User settings
Attributes	String name String email String password
Operations	saveSettings() render() getCurrentSettings()

Class Name	ProfilePanel
Package Name	Views
Description	The panel which appears after a click on the profile image and displays some details about the profile
Attributes	String profileLink String settingsLink Image image
Operations	render()

Class Name	OnlineResourceCard
Package Name	Views
Description	Component block with online resources information.
Attributes	String title String owner String link Image photo Component Comment comment List<String>comments
Operations	render()

Class Name	Category
Package Name	Views
Description	A component to represent each feed (online resources, buy and sell, tutorship, teacher ratings)
Attributes	Image image String text
Operations	onclick() render()

Class Name	BuyAndSellCard
Package Name	Views
Description	The component displays an item for sell, showing its all available info
Attributes	String info String ownerID String contactInfo double price Image image Component Comment comment List<String>comments
Operations	onclick() buy() render()

Class Name	PostOnlineResources
Package Name	Views
Description	User can post online resources using this component.
Attributes	String title String info List tags List images
Operations	uploadImage() post() render()

Class Name	PostBuyAndSell
Package Name	Views
Description	User can post an item for sale to buy and sell section.
Attributes	String title String owner String info String contactInfo List images String price
Operations	uploadImage() post() render()

Class Name	TutorshipCard
Package Name	Views
Description	The component which displays an information about available tutor
Attributes	String name Double price String contactInfo Image img Component Comment comment List<String>comments
Operations	hire() render()

Class Name	PostTutorship
Package Name	Views
Description	Users who want to tutor can post ads using this component.
Attributes	String title String owner String contactInfo String price

Operations	post() render()
------------	--------------------

Class Name	TeacherRatingCard
Package Name	Views
Description	Ratings of the teacher
Attributes	String name Int[] rating Component Button rate Component Comment comment List<String>comments
Operations	onclick() render()

Class Name	TeacherRateForm
Package Name	Views
Description	The pop-up form for a user to fill out in order to rate a teacher
Attributes	Component Button submit
Operations	render()

Class Name	Announcement
Package Name	Views
Description	An important/popular announcement in bilkent
Attributes	String text Image image
Operations	onclick() render()

Class Name	QuestionCard
------------	--------------

Package Name	Views
Description	The question asked by a student displayed as the question block
Attributes	Image image String question Int upvotes Int downvotes Date date String title Component Comment comment List<String>comments
Operations	onclick() render()

Class Name	AnnouncementContainer
Package Name	Views
Description	The container for Announcement
Attributes	List<Announcement>announcements
Operations	render()

Class Name	QuestionCardContainer
Package Name	Views
Description	A container for QuestionCards
Attributes	List<QuestionCard>questionCards
Operations	render()

Class Name	CourseMaterialCardContainer
Package Name	Views
Description	A container for CourseMaterialCard
Attributes	List<CourseMaterialCard>courseMaterialCards

Operations	render()
------------	----------

Class Name	OnlineResourceCardContainer
Package Name	Views
Description	A container for OnlineResourceCards
Attributes	List<OnlineResourceCard>onlineResourceCards
Operations	render()

Class Name	TutorshipCardContainer
Package Name	Views
Description	A container for TutorshipCards
Attributes	List<TutorshipCard>tutorshipCards
Operations	render()

Class Name	TeacherRatingCardContainer
Package Name	Views
Description	A container for TeacherRatingCards
Attributes	List<TeacherRatingCard>teacherRatingCards
Operations	render()

Class Name	Feeds
Package Name	Views
Description	The component which keeps the feeds
Attributes	String text List<Category>feeds
Operations	render()

Class Name	Departments
Package Name	Views
Description	Container component that keeps department components.
Attributes	List<Department> deps
Operations	render()

Class Name	Comment
Package Name	Views
Description	Component for writing comments on question, answers, etc.
Attributes	String inputText Button comment
Operations	render() submit()

Class Name	Department
Package Name	Views
Description	Component to display each available departments.
Attributes	String name List<Course> courses
Operations	render() setState()

Class Name	App
Package Name	Views
Description	Main Container component.

Attributes	Component CardsContainer Component Announcements Component Header Component FilterContainer
Operations	ReactDOM.render()

Class Name	Course
Package Name	Views
Description	Filter component used to filter questions or answers.
Attributes	String name
Operations	render() onClick() setState()

Class Name	FilterContainer
Package Name	Views
Description	Container component that keeps Feeds and Departments components.
Attributes	Component Feeds Component Departments
Operations	render()

3. Glossary

MERN stack - Modern JavaScript full stack for web development (MongoDB, Express, React, Node)

4. References

[1]. “Elasticsearch,” *Open Source Search & Analytics · Elasticsearch*. [Online]. Available: <https://www.elastic.co/products/elasticsearch>. [Accessed: 04-Feb-2018]