

Practical Workshop on Agile Software Development

by

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The workshop will focus on practical experience sharing about agile software development methodology and detail day-to-day implementation of one of the agile methodologies i.e. SCRUM as well as step by step workshop on agile software development using a real-world implementation of a system.

Objective of the workshop

At the end of the workshop, trainees will have an understanding, experience, and knowledge of how American and European IT companies develop applications and be able to develop one using the same methodology and technology stack.



PRACTICAL WORKSHOP ON AGILE SOFTWARE DEVELOPMENT



Executive Summary of the workshop

The workshop will focus on practical experience sharing about agile software development methodology and detail day-to-day implementation of one of the agile methodologies: SCRUM. Then, an introduction to Git version control system will follow with the purpose of acquainting trainees to the main features provided. Once students have a base on Git, we will develop an API using Spring Boot framework and Postgres database will be the next topic. Afterward, we will develop a web application using ReactJS and Javascript, and a Hybrid (Android and iOS) mobile application using Flutter SDK and Dart programming language.

The workshop will be given in a practical way by developing a web and a mobile-based application using the recommended design patterns for developing APIs. The application we will develop is a simple money transfer system with features, which are common on most applications such as registering, logging in, sending money, and listing the current balance and all transactions. Finally, these applications will be deployed to a cloud server called Heroku.

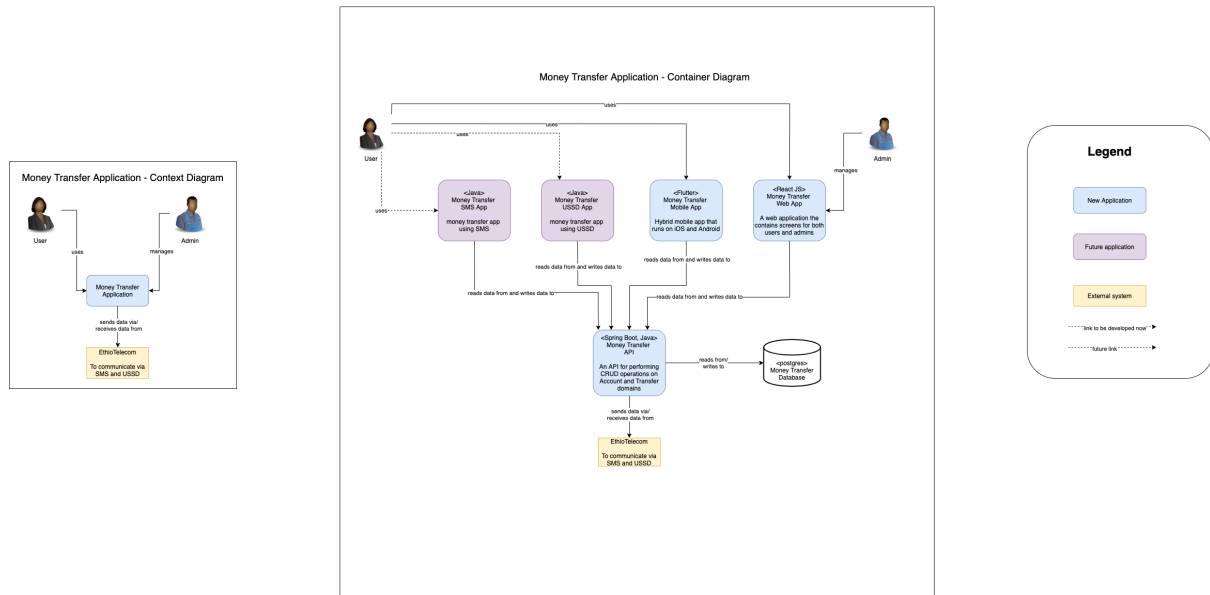
Trainees will be divided into agile teams and will work on the project with a high level of support from the instructor. Training on how to use Git distributed version control system and GitHub.com, Trello project management, Travis CI (continuous integration) as well as Heroku deployment platform will also be given.

At the end of the workshop, trainees will have experience and knowledge of how a system is developed in agile-based software companies you know in Silicon Valley, Europe, and all over the world.

Architectural Diagram of the Money Transfer App built in this workshop

Money Transfer Application - Architectural Diagram using the C4 model

Context Diagram and Container Diagram are presented below.



Minimum Requirements

In order to attend the workshop, the trainees should be familiar with

- Software Development Lifecycle,
- Java programming language,
- Javascript programming language,
- SQL database scripting,
- Mobile application development using any framework.

Required Resources

Every trainee should have a computer (preferably a high-performance laptop) with a high-speed internet connection to install the required application packages. These are:

- **Spring Boot - Backend API Development**
 - If you are using Windows OS, [Install Ubuntu on Windows 10](#)
 - Installing SDKMAN! <https://sdkman.io/install>
 - Spring Boot with `sdk install springboot 2.4.3`
 - Java version 11 with `sdk install java 11.0.3.hs-adpt`

- IntelliJ IDEA Ultimate
<https://www.jetbrains.com/idea/download/#section=windows>
- PostgreSQL database <https://www.postgresql.org/download/>
- Download Postman - a REST API Client (tester)
<https://www.postman.com/downloads/>
- **React JS - Frontend Web Development**
 - Downloads Node.js Latest LTS Version: 14.16.0 (includes npm 6.14.11)
<https://nodejs.org/en/download/>
- **Flutter - Mobile App Development**
 - Flutter SDK <https://flutter.dev/docs/get-started/install/windows>
 - Download and install Android Studio <https://developer.android.com/studio>
 - Set up the Android emulator
<https://flutter.dev/docs/get-started/install/windows#set-up-the-android-emulator>

Websites to create accounts on

- github.com
- trello.com
- heroku.com

Core Concepts Covered

- Agile Manifesto
- Scrum Roles and Ceremonies
- Kanban Visualization
- Breaking down big features into smaller and achievable tasks
- Microservices architecture
- C4 Architectural Diagramming
- TDD - Test Driven Development
- Pair Programming
- CI/CD - Continuous Integration and Continuous Deployment
- Using Source Code Management (SCM) or Version Control System (VCS)
- API (Application Programming Interface) development with a real database
- Web app development framework and integrating with an API
- Hybrid Mobile app development and integrating with an API

Workshop content and schedule

1st day [Morning] [2 hours]

- Agile Software Development Methodology

- Agile Manifesto
- SCRUM: Process, Roles, and Ceremonies
- KANBAN: Process

PRACTICE:

Organizing agile teams within the trainees

1st day [Afternoon] [5 to 6 hours]

- Git version control system and Github.com
 - git status, git add ., git commit -m "<message>", git push, git pull, git clone, git branch, git merge, git rebase, git reset
- Trello project management
- Software Architecture Design

PRACTICE:

- Explanation of the system we will design (Money transfer app)
- Design the architecture using the C4 model
- Create Github repository
- Create Trello board

2nd day [8 hours]

- Spring Boot with Java
 - Create Spring boot project using IntelliJ IDEA IDE
 - Create domain classes, controllers, services, and repositories
 - Setup Postgres database
 - TDD - Test Driven Development
 - Pair Programming

PRACTICE:

- Installing SDKMAN, Git, and Spring Boot
- Creating a free GitHub account
- Use Spring boot and Java to develop the API and push it to GitHub (using Git)
- Practicing TDD
- Practice Pair Programming with one of the attendees

3rd day [8 hours]

- React JS

PRACTICE

- Create a reactjs project using [create-react-app] (<https://github.com/facebook/create-react-app>)
- Pushing it to Github (via Git)
- Create two web components: view transaction and balance, and send money
- Connect to the API - reading data (GET) and sending data (POST)

4th day [8 hours] => OPTIONAL MODULE

- Flutter SDK

PRACTICE

- Create a Flutter project
- Pushing it to Github (via Git)
- Create three screens with navigation: login, view transaction, and balance, and send money
- Connect to the API - reading data (GET) and sending data (POST)

Finally

- making our app production-ready and our codebase look professional

PRACTICE

- Code refactoring
- Use Travis CI for running tests and deployment
- Deploying to Heroku
- Release the React app
- Release the mobile app to Google Play Store
- Show your app to the world!
- Handling production bugs

References

- “Agile Software Development, Principles, Patterns, and Practices” By Robert C. Martin <http://www.amazon.com/gp/product/0135974445>
- [Hands-On Full Stack Development with Spring Boot 2 and React - Second Edition](#)
- “Agile Estimating and Planning” by Mike Cohn <http://www.amazon.com/gp/product/0131479415>
- Scrum and XP from the trenches <https://www.crisp.se/bocker-och-produkter/scrum-and-xp-from-the-trenches>
- Kanban Scrum Minibook <http://www.infoq.com/minibooks/kanban-scrum-minibook>

Further Links

- [Top 20 Agile Development Books Ever](#)