In this course unit [CM-W-WEB] a structured software development process of web applications is illustrated. The application development makes use of current software development concepts, such as Behavior-Driven Development (BDD), Domain-Driven Design (DDD), microservice architectures including a systematic design of the web Application Programming Interfaces (API) of the microservices.

(1) An overview of the relevant development concepts is given and the application development process based on these concepts is introduced. The core concepts and technologies are illustrated with the example of a web application.

(2) The development of advanced web application requires a complex tool environment. The organization of software development projects is supported by a specific set of project management and version control tools which are described in more detail in this chapter.

(3) This chapter deals with the analysis, the first phase of the development process, in which the requirements are specified. The approach uses Gherkin features which are the central artifact of the BDD concept.

(4) The domain model is the central artifact of the subsequent design phase. In the domain model which is built according to DDD principles, the (structural and functional) knowledge needed to implement the software system is formally captured. API specifications are derived from the domain model and the application architecture.

(5) In the implementation phase the functionality as is was specified in the analysis and design phase is coded based on a mircroservice architecture. The domain model is systematically transformed into code and the code is extended by annotations by which the microservice API is specified as a part of the code.

(6) The implemented web application is deployed in a container-virtualized infrastructure. Leading technologies used to build and run this infrastructure are Docker and Kubernetes.

C&M	Cooperation & Management
KIT	Karlsruhe Institute of Technology

[CM-W-WEB] Cooperation & Management: WEB APPLICATION DEVELOPMENT. WASA Course Unit. *https://team.kit.edu/sites/cm-tm/Mitglieder/2-2.WASA_Lecture*