need to touch markup languages or JavaScript. Typical server-side Vaadin applications use server-side components that are rendered on the client-side using their counterpart widgets. A server-side component must manage state synchronization between the widget on the client-side, in addition to any server-side logic.

Apache Tomcat 9.0 is an application Server. It is an open-source Java Servlet Container. Tomcat implements several Java EE specifications including Java Servlet, JavaServer Pages, Java EL, and WebSocket, and provides a "pure Java" HTTP web server environment in which Java code can run.

PostgreSQL 9.6 was selected as the database for storing the application information. To build the project Apache Maven 3.3.9 was used. SCRUM was chosen as the development process. SCRUM is an agile way to manage a project, usually software development.

At the moment the application is under testing.

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MICROSERVICES ARCHITECTURE

Приводится обзор микросервисной архитектуры, которая в последнее время очень широко используется при разработке программного обеспечения. Рассматриваются преимущества данного подхода по сравнению с альтернативными технологиями.

Microservices is a specialization of an implementation approach for service-oriented architectures (SOA) used to build flexible, independently deployable software systems. Services in a microservice architecture (MSA) are processes that communicate with each other over a network in order to fulfill a goal. These services use technology-agnostic protocols. The microservices approach is a first realization of SOA that followed the introduction of DevOps and is becoming more popular for building continuously deployed systems.

In a microservices architecture, services should have a small granularity and the protocols should be lightweight. A central microservices property that appears in multiple definitions is that services should be independently deployable. The benefit of distributing different responsibilities of the system into different smaller services is that it enhances the cohesion and decreases the coupling. This makes it easier to change and add functions and qualities

to the system at any time. It also allows the architecture of an individual service to emerge through continuous refactoring, and hence reduces the need for a big up-front design and allows for releasing software early and continuously.

There is no industry consensus yet regarding the properties of microservices, and an official definition is missing as well. Some of the defining characteristics that are frequently cited include:

– the services are easy to replace;

– services are organized around capabilities, e.g., user interface front-end, recommendation, logistics, billing, etc.;

– services can be implemented using different programming languages, databases, hardware and software environment;

– services are small in size, messaging enabled, bounded by contexts, autonomously developed, independently deployable, decentralized and built and released with automated processes;

– services communicate with lightweight mechanisms, often an HTTP resource API.

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IMPLEMENTATION OF VIDEO CALLS FOR MACOS PLATFORM

В настоящее время использование видеовызовов очень актуально. Развитие ИТ-индустрии, продажа мобильных устройств со встроенной камерой, удобные тарифные планы различных мобильных операторов оказывают большое влияние на использование программного обеспечения, специально разработанного для этой цели. Рассматриваются альтернативы реализации видеовызовов на устройствах, работающих на платформе MacOS.

We live in the era of information technologies and communications. From ancient times it is will be very important to communicate at a distance. It all started with the simple letters, then phone calls, emails, and finally the world saw video calls.

Nowadays, the use of video calls is very actual. The development of the IT industry, the sale of mobile devices with built-in camera, as well as the widespread distribution of hot spots and convenient tariff plans of different mobile operators has a great influence on using some software designed specifically for this purpose.

This course work include organization and practical implementation of video features for MacOS platform and consist of three chapters.