CLOUD APPLICATION FOR A NETWORK OF SPORTS COMPLEXES

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DOI: https://doi.org/10.30525/978-9934-26-630-0-5

The modern trend for a healthy lifestyle stimulates the development of sports services infrastructure, in particular networks of fitness clubs and sports complexes. The growth in the number of clients, the expansion of the range of services provided and the need to optimize business processes in such institutions require the use of modern digital solutions that can be scaled in accordance with changes in the load and provide a high-level software availability.

Business processes performed in networks of sports complexes are often accompanied by a number of difficulties: inefficient management of training registrations, problems with accounting for subscriptions and equipment, the complexity of communication between clients and trainers, as well as an insufficient level of analytics for making management decisions. The use of classic client-server corporate desktop systems and web systems has limited scalability, since an increase in the number of users and the volume of data requires additional computing resources and server equipment modernization. In addition, such systems are difficult to maintain and support: it is necessary to regularly update the software according to constantly changing business requirements, back up data, administrate servers and provide their uninterrupted work. In this context, the implementation of the Cloud Native approach [1] is of particular importance because of its advantages described below.

1) Provides a high degree of automation and optimization of the software lifecycle, including continuous delivery of updates, resource orchestration, and high fault tolerance.

2) Supports simplified software maintenance through the use of microservice architecture.

3) Reduces IT infrastructure costs.

In the developed cloud application for a network of sports complexes the following business processes are automated: accounting for clients, subscriptions, coaches, locations, training sessions, managing sports equipment, tracking client feedback, as well as generating analytical reports to evaluate, analyze and improve various aspects of sports complexes activities,

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ranging from location occupancy and trainer productivity to customer and service ratings. A feature of the developed application is that it provides an individual approach to clients. This is possible because the trainer can record the results of each training session which are available for clients to view, so clients can track their progress in achieving their training goals and receive professional recommendations.

The application is built using microservice architecture [2]. A RESTful API [3] based on the Django and Django REST Framework is implemented for the application. The user interface is created using HTML, CSS, JavaScript. Data storage is provided using the PostgreSQL DBMS. The application is deployed on the resources of the cloud service provider DigitalOcean and corresponds to the IaaS model [4]. The application is assembled and deployed using the Docker and Docker-compose containerization tools. Request routing and static file processing is provided. To ensure application security, authentication and authorization mechanisms are implemented. Data protection is organized using a firewall, the delimitation of access rights of different categories of users is established. The Certbot plugin is been configured to automatically obtain SSL certificates and provide a secure connection via HTTPS protocol.

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