Unit 6 & 11 Evaluation

Course: MSc Computer Science

Module: Secure Software Development (Computer Science)

Assignment: ePortfolio

Date: Monday 1st November 2021

Student ID: 126853

Evaluation:

Within the Unit 6 assignment of the Secure Software Development (Computer Science) module, we had investigated and designed a piece of software to be used by CERN researchers for secure storage of research materials. During this process, we had decided to use a well-known Python framework, Django, to increase the speed of development and provide an effective ORM system for model management (MindFire Solutions, 2018).

Although we had tried to ensure that our code delivered within Unit 11 met the Unit 6 Design Document in its entirety, there was a small selection of items that had to be omitted due to technical limitations, time limitations or features that otherwise existed within the framework. One such item that included significant differences was the Entity Relationship Diagram, where a series of columns were included as part of the Django Framework's user management system and the token blacklisting tables.

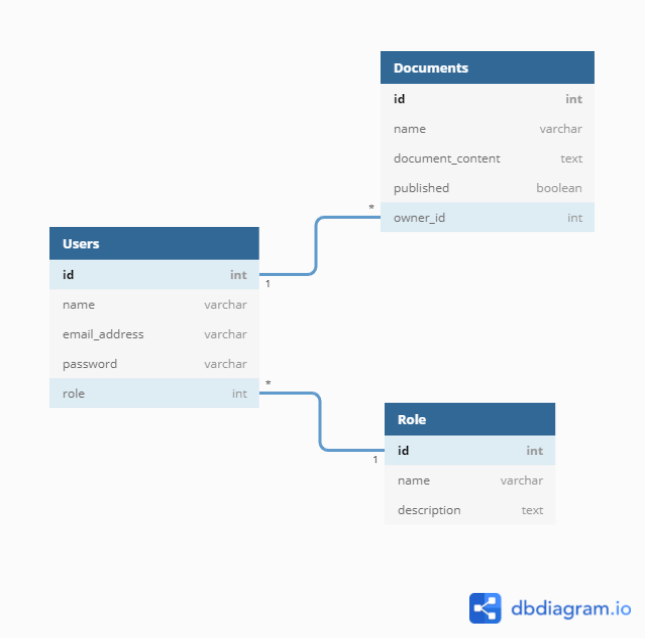

Figure 1: Proposed Entity Relationship Diagram (Holmes et al., 2021)

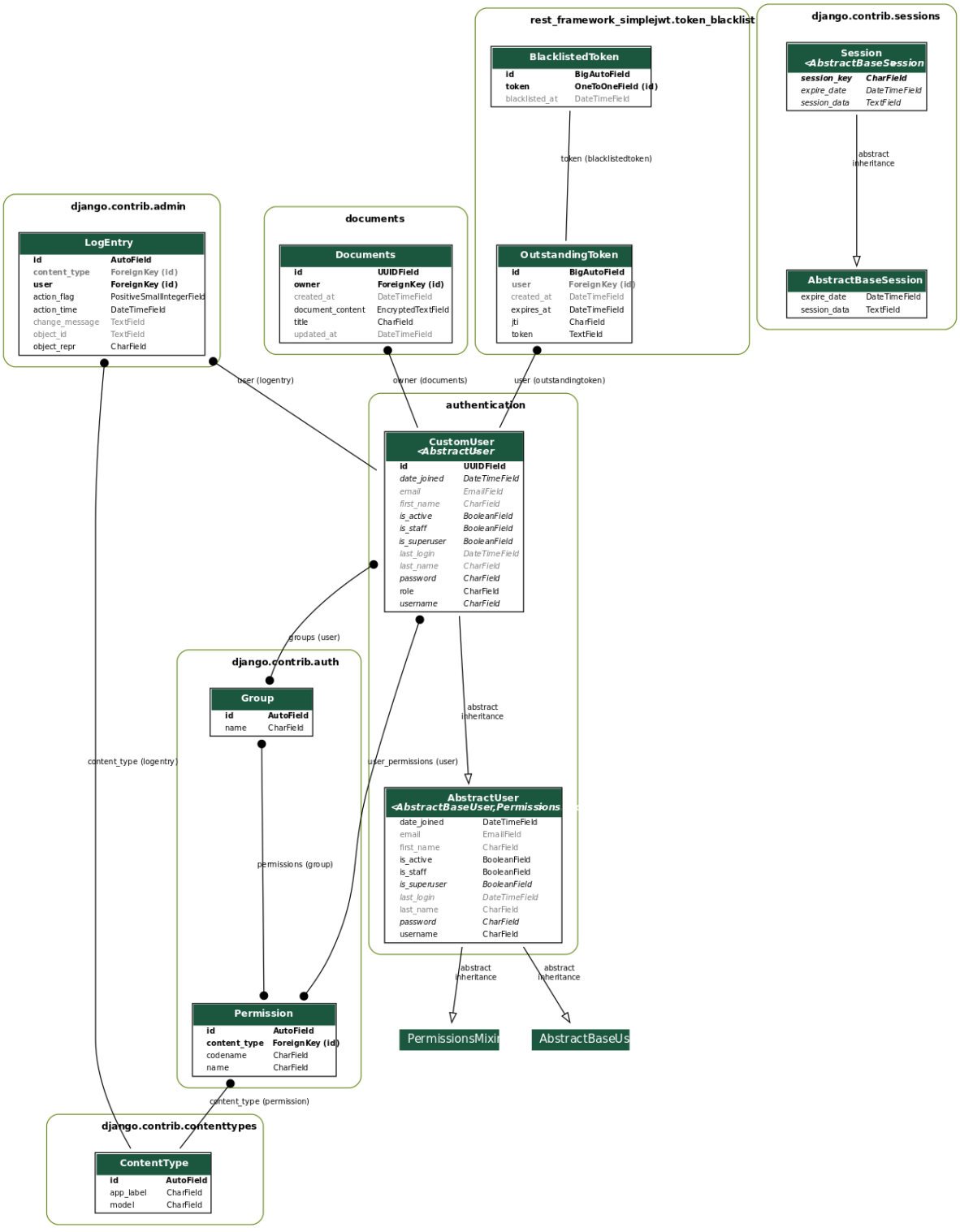

Figure 2: Actual Entity Relationship Diagram.

In order to increase the overall security aspects of our submission, additional features such as the usage of Javascript Web Tokens were implemented, allowing the CERN administrators to revoke API keys in the event of a breach, as well as ensuring the clients do not need to send Usernames/Passwords on each request.

In conclusion, I believe that the solution we delivered had fully met the original project brief, as set out in the assignment notes. In addition, we ensured a core focus on the OWASP API Top Ten (2019) items throughout developments, including API4:2019 – Lack of Resources & Rate Limiting and API8:2019 – Injection. Most of these features were covered within the Django framework defaults, but some require additional modules to be installed or custom code written to ensure security.

References:

Holmes, K. Obayemi, K. Zavarce, S. (2021) 'Unit 6: Design Document'. Paper submitted to the University of Essex Online for Secure Software Development (Computer Science).

MindFire Solutions. (2018) Advantages and Disadvantages of Django. Available from: https://www.mindfiresolutions.com/blog/2018/04/advantages-and-disadvantages-of-django/ [Accessed 1st November 2021].

OWASP Top Ten. (2019) API Security Top 10 2019. Available from: https://owasp.org/www-project-api-security/ [Accessed 1st November 2019].