CS551Q Enterprise Software Development (2023-24)
Assessment 3: Programming Exercise – Solo Django Application
(Design & Development Report)

Introduction

The EpochCraft project aimed to create a robust e-commerce platform dedicated to the promotion and sale of EcoCredits—virtual goods that directly contribute to global sustainability efforts. Built with Django, a high-level Python web framework, EpochCraft offers comprehensive user management, product browsing, and seamless cart and payment functionalities.

Overview and Approach:

- Database and Authentication: Utilizes Django's ORM for structured data management across several relational tables including Country, Product, Cart, CartItem, and Purchase. It features sophisticated user roles (admins, registered users, guests) with secure authentication and session management.
- Product Browsing and Engagement: Offers access to a detailed catalogue of 265 items. Each product page includes interactive data visualizations of the country's yearly electric power consumption using Chart.js, enhancing user engagement with factual insights.
- Transaction Security: A secure cart and checkout system, coupled with stringent payment detail validation (card number, expiry, CVV), ensures transaction safety.
- Deployment and Functionality: Hosted on Render (https://solo-assignment.onrender.com), featuring pagination and keyword-based search functionality to optimize user experience and platform accessibility.

Security Measures and Testing

- Security Protocols: Includes password reset functions using Django's SMTP backend, transaction validation, and user authentication to protect user data and prevent unauthorized access.
- Testing Strategy: Employs a combination of Django's built-in testing tools and Behave for behavioural testing, covering all aspects from model integrity to user interaction flows, ensuring comprehensive platform reliability.

Dashboard Data Simulation and Management

- Faker Utilization: Faker is employed to generate realistic random user profiles and purchase data, enriching the admin dashboard with dynamic and comprehensive aggregates. This simulated data helps in demonstrating the dashboard's capability to provide meaningful insights and trends, enhancing administrative decision-making.

Technical Challenges and Solutions

- Data Migration: Addressed challenges in migrating data to new schemas with custom Django management commands that automated the process, maintaining data integrity.
- Email Configuration: Resolved SMTP email backend setup issues for password resets by configuring settings for compatibility, security, and reliable delivery.

Future Enhancements

- Enhancing Mobile Accessibility: Future updates will focus on improving mobile responsiveness using advanced CSS and JavaScript frameworks to ensure the platform is fully functional across all devices.
- Advanced Data Visualization: Plans to expand the admin panel's capabilities with real-time charts and graphs for a more intuitive understanding of sales trends and user behaviour.

Conclusion

EpochCraft is not just a platform; it is a commitment to sustainability, designed to educate and engage users in energy conservation through the innovative use of technology. By merging environmental impact with digital convenience, EpochCraft sets new standards in the realm of environmentally focused e-commerce platforms.

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