(TR-102)
MASTERING THE SEMANTIC WEB

Training Day 6 Report:

19 June 2024

The sixth day of the TR-102 training focused on creating RDF graphs from Turtle files, understanding Non-Functional Requirements (NFRs) for Web 3.0, and utilizing tools for web performance optimization. Key activities included practical exercises in RDF graph creation, web content optimization, and deployment of web pages on various platforms.

NFR:

- **Non-functional requirements (NFRs)** are specifications that describe the operational capabilities and constraints of a system. They define how well a system performs, including aspects such as speed, security, reliability, data integrity, and usability.
- NFRs are crucial for ensuring that a system meets quality standards and user expectations. • Some examples of NFRs include:
    - **i.** **Performance:** How fast the system responds to user actions.
    - **ii.** **Reliability:** How often the system experiences failures or crashes.
    - **iii.** **Security:** How well the system protects against unauthorized access or data breaches.
    - **iv.** **Scalability:** Designing systems that can grow and handle increased load.
    - **v.** **Usability:** How easy the system is to use and understand.

Tools for Enhancing Web Performance:

- Participants explored various tools to measure and improve web performance:
    - **i.** **Google PageSpeed Insights:** Analyzes the content of a web page and provides suggestions to make it faster.
    - **ii.** **Lighthouse:** An open-source tool for improving the quality of web pages, providing audits for performance, accessibility, progressive web apps, SEO, and more.
- **Tasks done:**
    - Used Google PageSpeed Insights and Lighthouse to audit web pages.
    - Applied recommendations to improve performance scores.

Optimization Techniques:

- **Testing for Mobile and Desktop:** Tested web pages on both mobile and desktop to ensure web pages are optimized and perform well on both mobile and desktop devices.
- **Using .webp format:** Converted existing images to .webp format and replaced .jpg, .png, and .gif formats to enhance performance. Using .webp images over traditional formats like .jpg, .png, or .gif provides better compression and faster load times.
- **PageSpeed Insights:** Detailed analysis and reports on web page performance.
- **Minification:** The process of minimizing CSS and JS files by removing unnecessary characters without changing their functionality, improving load times by reducing file sizes.

Deployment and Performance Checking:

- Uploaded web pages to Netlify, Vercel, and GitHub Pages.
- Analysed and verified the performance of deployed web pages using the tools mentioned.

Conclusion:

Day 6 of the TR-102 training equipped participants with essential skills in RDF graph creation, web performance optimization, and deployment. By focusing on critical NFRs and utilizing powerful tools, attendees are now capable of building and maintaining high-performance, scalable, and user-friendly web applications. This session highlighted the importance of continuous optimization and testing, ensuring that web applications meet the evolving demands of users and technologies in the Web 3.0 era.