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System Implementation

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0.2	15/05/2024	Introduction
0.3	20/05/2024	Implementation Procedures
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PU	Public	**X**
PP	Restricted to other programme participants (including the EC Services)	
RE	Restricted to a group specified by the consortium (including the EC Services)	
CO	Confidential, only for members of the consortium (including the EC)	

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Abbreviations List	
Full Name	**Acronym**
Integrated Software Training System	**ISTS**
Search Engine Optimization	**SEO**
European Union	**EU**
Graphical User Interface	**GUI**
User Interface	**UI**
Virtual Machine	**VM**
Uniform Resource Locator	**URL**
Simple Mail Transfer Protocol	**SMTP**
General Data Protection Regulation	**GDPR**
Wi-Fi Protected Setup	**WPS**
Cascading Style Sheets	**CSS**
Work Package	**WP**

List of Pictures

Executive Summary

This deliverable presents comprehensive documentation describing the procedures followed during the implementation of each subsystem within the project. It aims to support seamless knowledge transfer and efficient system maintenance, ensuring that future programmers can maintain, debug, and extend the system with minimal disruption.

The documentation serves as a resource, providing clear explanations of code segments and outlining specific workarounds employed during development. By offering these insights, it facilitates easier comprehension and debugging for maintenance programmers who will work on the system in the future.

The evaluation of the functionality within this document is intended to uphold the system's integrity and operational efficiency over time. By providing comprehensive documentation, this deliverable aims to ensure that future programmers have the necessary information to maintain, debug, and extend the system with minimal disruption.

1. Introduction

This deliverable has been produced in the context of the Digital Europe Project "TRUST-FOOD – Advanced Digital Skills on Blockchain for Trusted Food Supply Chains," which is co-funded by the European Commission under the Grant Agreement ID: 101100804. This document serves as a comprehensive support document detailing the implementation procedures for both the Front Office and Back Office of the TRUST-FOOD Website Application. It aims to document the intricacies of the development process, including explanations of code segments, workarounds, and evaluations of subsystem functionality. By doing so, this document facilitates seamless knowledge transfer and ensures efficient system maintenance.

The primary objective of this documentation is to equip future programmers with the insights and understanding necessary to effectively maintain, debug, and extend the system. By outlining detailed implementation procedures and offering clear explanations of code sections, this document enhances comprehension and simplifies troubleshooting.

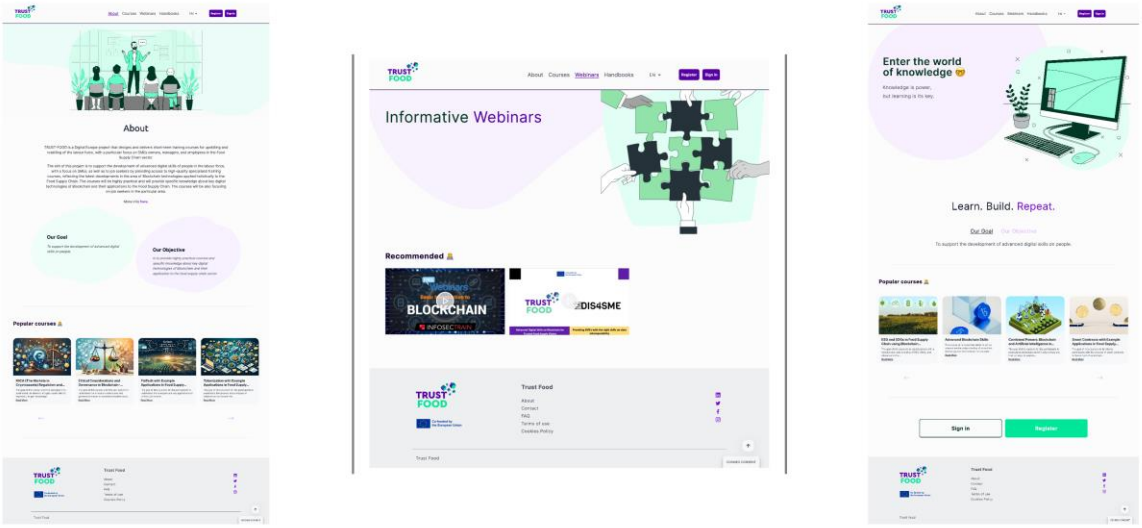
By documenting the development procedures and providing valuable insights, this support document aims to uphold the reliability and operational efficiency of the TRUST-FOOD Website Application over its lifecycle.

2. Implementation Procedures

2.1 Website Application

2.1.1 Overview

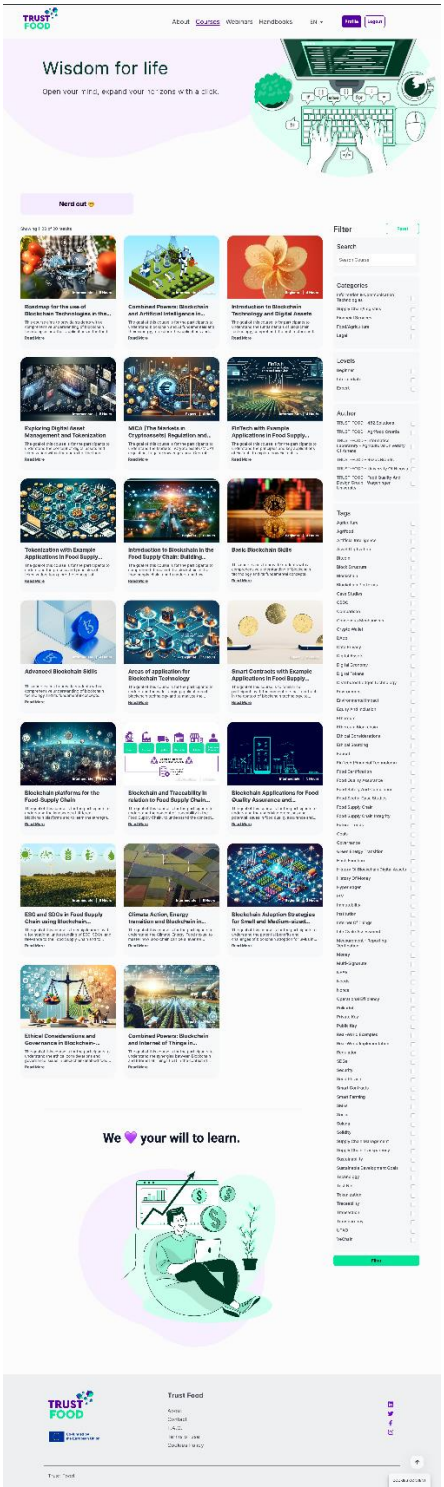
The TRUST-FOOD Website Application of the Integrated Software Training System (ISTS) (https://trust-food.ubitech.eu/) is a comprehensive educational platform implemented using web-based technologies (mainly WordPress).



Picture 1: Web Application About Page, Webinar Page , Home Page

The platform offers a rich multilingual experience, supporting seven languages and granting access to 20 courses completely free of charge. Course materials are diverse, including PDFs, videos, formative assessments and quizzes. Powered by the LearnPress LMS plugin, users can subscribe to gain course access, enroll in courses, and easily track their progress and status for each course they undertake.

Once students have completed all the lessons and quizzes in a course, they can click the "Finish Course" button to receive their certificate of completion. The LearnPress Certificate plugin, a versatile extension for the LearnPress LMS, facilitates this process by allowing instructors to design customized certificates that include course details, student names, completion dates, and signatures. Its flexibility allows for the creation of the certificate tailored to match the look and feel of the Trust Food Integrated Software Training System (ISTS) and meet the project's specific requirements, thereby enhancing the recognition and value of course completions.



Picture 2: Web Application Course Page

2.1.2 User Roles and Access

The Website Application employs a detailed role management system to control access to various functionalities, distinguishing between roles from WordPress and LearnPress:

- **Subscriber (Trainee) [LearnPress]:** Can enroll in courses, access course materials, and obtain certificates upon completion.
- **LP Instructor (Trainer) [LearnPress]:** Can edit their own courses and view courses created by other instructors. It has limited access to the admin page.
- **Admin [WordPress]:** Has full access to all functionalities, including course management, user management, and site settings.
- **Translator [WordPress]:** Manages the translation of content across the seven supported languages.
- **Web Designer [WordPress]:** Handles the design and layout aspects of the Website Application.
- **Shop Manager [WordPress]:** Manages the e-commerce aspects, including product listings and transactions (currently not used).
- **Customer [WordPress]:** General access similar to Subscriber but tailored to the e-commerce aspect.
- **Contributor [WordPress]:** Can write and manage their own posts but cannot publish them.
- **Author [WordPress]:** Can publish and manage their own posts.
- **Editor [WordPress]:** Can publish and manage posts, including those of other users.

2.1.3 Plugins

The Website Application utilizes a robust selection of plugins to enhance functionality, improve performance, and ensure a seamless user experience. The key plugins include:

- **Accessibility by UserWay**: Enhances platform accessibility to meet various user needs.
- **All-in-One WP Migration**: Facilitates easy migration and backup of the Website Application.
- **AutoConvert Greeklish Permalinks**: Converts Greek characters in URLs to Latin characters for better compatibility.
- **LiteSpeed Cache**: Enhances website performance through advanced caching techniques and optimization features.
- **Complianz | GDPR/CCPA Cookie Consent**: Manages cookie consent to comply with GDPR and CCPA regulations.
- **Connect Polylang for Elementor**: Integrates Polylang with Elementor for multilingual content management.
- **Download Monitor**: Manages downloadable files and tracks download statistics for handbooks and manuals.
- **Elementor & Elementor Pro**: Provides a drag-and-drop page builder for designing custom layouts.
- **Essential Addons for Elementor**: Adds additional widgets and functionality to Elementor.
- **Fonts Plugin**: Allows the use of Google Fonts, Adobe Fonts, or custom uploaded fonts.

- **Hide Admin Bar Based on User Roles**: Hides the admin bar for selected user roles.
- **Image Optimizer by Elementor**: Compresses, resizes, and optimizes images for better performance.
- **LearnPress**: A comprehensive LMS plugin for managing courses.
- **LearnPress - Certificates**: Issues certificates upon course completion.
- **LearnPress** - **Course Review:** Enables course reviews and ratings.
- **Loco Translate**: Manages translations directly from the WordPress dashboard.
- **PDF Poster**: Embeds PDF files directly into posts and pages.
- **Polylang**: Manages multilingual content.
- **Post SMTP**: Ensures reliable email delivery from the Website Application.
- **Tablesome**: Manages tables and data entries.
- **Thim Core, Thim Elementor Kit, Thim Portfolio**: Core functionalities and widgets for LearnPress and Elementor integration.
- **WP Events Manager**: Manages events and registrations.
- **WP Maximum Upload File Size**: Increases the maximum file upload size.
- **WPCode Lite**: Adds custom code snippets to the Website Application.
- **WPFront Scroll Top**: Adds a scroll-to-top button for better navigation.
- **WPS Hide Login**: Changes the login URL to enhance security.

2.1.4 Implementation Procedures

2.1.4.1 Setup and Configuration

The implementation of the TRUST-FOOD Website Application involved several key steps to ensure a robust and scalable setup:

1. **Virtual Machine Setup:**
    - A virtual machine (VM) was provisioned to host the WordPress site, ensuring isolated and secure hosting. The VM setup includes daily scheduled backups of the VM snapshot with a 5-day retention policy to safeguard against data loss and facilitate quick recovery in case of failures.
2. **WordPress Deployment via Docker:**
    - The WordPress environment was created using a Docker setup with a docker-compose.yml file. This setup streamlined the installation and configuration process, providing a consistent and replicable environment for development and deployment.
3. **Plugin Installation and Configuration:**
    - **Eduma - LearnPress**: Installed to provide a comprehensive Learning Management System (LMS) for managing courses, quizzes, and student progress.
    - **LearnPress - Certificates**: Enabled the generation and management of certificates for course completion.

- **Elementor and Elementor Pro**: Utilized for building and customizing the Website's Application pages with advanced design capabilities.
- **Polylang and Connect Polylang for Elementor**: Implemented to support multilingual functionality, enabling content translation across seven languages.

4. **Google Analytics Integration:**
    - Google Analytics was integrated into the Website Application to track and analyze user behavior, providing valuable insights into site usage, user engagement, and course performance. This integration helps in monitoring traffic sources, user demographics, and interactions, facilitating data-driven decision-making.

Additional plugins were installed to enhance the platform's functionality, including security, SEO, user management, and more (main plugins list provided in 2.1.3).

2.1.4.2 Course Management

- Use LearnPress to create and manage courses.
- Integrate PDF, video content, and quizzes into the course structure.
- Configure LearnPress add-ons for certificates and course reviews.

2.1.4.3 User Role Management

- Define and assign roles using WordPress's role management system.
- Use plugins like "*Hide Admin Bar Based on User Roles*" to customize the user experience based on roles.

2.1.4.4 Design and Layout

- Utilize *Elementor* and *Elementor Pro* for page building.
- Customize design elements with *Essential Addons for Elementor* and *Thim Elementor Kit*.

2.1.4.5 Performance and Optimization

- Optimize images with *Image Optimizer by Elementor*.
- Ensure efficient file management with *PDF Poster*, *Download Monitor* and *WP Maximum Upload File Size*.
- Enhance Website Application performance by minifying, caching scripts and styles and other optimization techniques using *LiteSpeed Cache.*

2.1.4.6 Accessibility and Compliance

- Ensure accessibility features are available in all devices by using *Accessibility by UserWay* and custom CSS styles.
- Ensure GDPR compliance with *Complianz*.

2.1.4.7 Security

- Enhance security by using *WPS Hide Login* to change the Website Application administrator login URL.
- Ensure reliable email communications with *Post SMTP*.

2.1.4.8 Maintenance and Updates

- Regularly update WordPress core, themes, and plugins.
- Backup the site using *All-in-One WP Migration*.

This structured approach ensures that the TRUST-FOOD Website Application is not only functional and user-friendly but also secure and compliant with regulatory standards.

3. Description of code or workarounds.

The implementation of the TRUST-FOOD Website Application involved several customizations and workarounds to ensure the platform met all the specific requirements and provided an optimal user experience. Below are the key customizations and workarounds.

3.1 Setup for WordPress

A *docker-compose.yml* file was created to streamline the deployment of WordPress and its dependencies. This setup included configurations for the WordPress container, database container, and persistent storage, ensuring a consistent development and production environment.

3.2 Custom Configurations

- **Course Customization:** Specific course layouts and functionalities were customized using *LearnPress* hooks and filters. This included modifying the course enrolment process and adjusting the certificate issuance criteria.
- **Certificate Customization:** The *LearnPress - Certificates* plugin was extended with custom templates to match the branding and design requirements of TRUST-FOOD.

3.3 Multilingual Support

- **Polylang Integration:** Custom scripts were developed to ensure seamless integration between *Polylang* and *Elementor*, allowing dynamic content to be displayed correctly in all seven supported languages.
- **Translation Management:** Custom roles and permissions were configured for Translators to manage content translations effectively.

3.4 User Roles and Permissions

- **Custom Role Definitions:** Additional roles were defined to control access and capabilities within the WordPress admin area. The included roles are *LP Instructor*, *Translator*, *Web Designer*, *Shop Manager*, *Customer*, *Contributor*, *Author*, and *Editor*.
- **Role-Based Access Control:** Custom code was implemented to enforce role-based access control, ensuring that users only have access to the functionalities appropriate to their roles. This included hiding admin bar options and dashboard elements based on user roles.

3.5 Course Material Management

- **Download Monitor Customization:** The *Download Monitor* plugin was customized to track and report downloads of course materials, handbooks, and manuals. Custom scripts were added to log download statistics and generate reports.
- **PDF and Video Handling:** Custom shortcodes and widgets were developed to embed PDFs and videos within course content dynamically. The *PDF Poster* plugin was integrated to handle inline PDF viewing.

3.6 Google Analytics Integration

- **Custom Tracking Code:** Custom Google Analytics tracking code was added to the site's header to monitor user interactions and engagement across the platform. This included tracking page views, course enrolments, and quiz completions. The custom JavaScript snippet with Google Analytics tag was added under Code Snippets -> Code Snippets.

3.7 Performance Optimization

- **Image Optimization:** Custom configurations were applied to the *Image Optimizer by Elementor* plugin to automatically compress and resize images uploaded to the site, ensuring faster load times and improved performance.
- **Caching and Minification:** Custom caching and minification strategies were implemented *LiteSpeed Cache* plugin to enhance site speed and efficiency.

3.8 User Interface and Experience

- **Elementor Customizations:** Custom Elementor widgets and templates were created to match the TRUST-FOOD branding and design guidelines. This included custom headers, footers, and course layout templates.
- **Accessibility Enhancements:** Custom scripts were added to enhance site accessibility, including keyboard navigation improvements.
- **Custom CSS Code:** Custom CSS code was added under Elementor -> Custom Code -> Global CSS to apply custom styles and enhance the Website's Application responsiveness.

3.9 Custom JavaScript Implementations:

- **Course Filters:** A custom JavaScript script was added under Code Snippets -> Code Snippets to automatically close course filters on the courses page for devices with a width of ≤991px when the user clicks the Filter and Reset buttons.

- **Conditional Field Requirements:** Another script was added to make the Organization field required when a student selects that they are an Employee rather than a Job Seeker in Profile -> Settings -> General Website Application page.
- **Video Resumption:** Custom JavaScript was added to ensure that videos in lessons resume from where the user left off under Elementor -> Custom Code -> Resume Video.

3.10 Additional CSS Customizations:

- **Header & Footer Customizations:** Custom CSS was added under Code Snippets -> Header & Footer in the Header section for styling the Learning Resources table view.

These customizations and workarounds were crucial in delivering a fully functional and user-friendly TRUST-FOOD Website Application, tailored to meet the specific needs of its diverse user base.

4. Evaluation of the Functionality

The TRUST-FOOD Website Application is built using a structured and modular approach that leverages WordPress as its core CMS. This setup ensures a scalable, flexible, and user-friendly learning management system (LMS) for its users. Below is an evaluation of the functionality of each subsystem and an explanation of the source code and configurations used.

4.1 Virtual Machine and Docker Container Setup

4.1.1 Functionality

- The Website Application runs on a virtual machine (VM) that ensures a stable and isolated environment for the application.
- Docker containers encapsulate the WordPress application and MySQL database, providing consistency across different development and production environments.

4.1.2 Evaluation

- **Performance:** The use of Docker containers simplifies deployment and scaling, ensuring that the application runs reliably across various environments.
- **Reliability:** The daily scheduled backup of the VM snapshot with a 5-day retention policy provides a strong backup and recovery mechanism.

4.1.3 Source Code Explanation

- The docker-compose.yml file is used to set up the WordPress and MySQL services, defining volumes for persistent storage and network configurations for service communication.

4.2 WordPress Back Office

4.2.1 Functionality

- **User Roles Management:** Admins can assign roles such as Admin, Trainer, and Trainee, which are crucial for managing access levels and permissions.
- **Plugins:** Enhance functionality for course management (LearnPress), multilingual content (Polylang), and design (Elementor).
- **Custom Code:**
    - CSS customizations for styles and responsiveness.
    - JavaScript snippets for interactive functionalities like course filter management and video resumption.
    - Header & Footer customizations for specific page layouts.
    - Explanatory comments to assist future developers in understanding and maintaining the custom code.

4.2.2 Evaluation

- **Flexibility:** The use of plugins and custom code snippets allows for significant customization and enhancement of the LMS capabilities.
- **Usability:** The admin interface is intuitive, especially with Elementor providing a WYSIWYG editor, making it easy for non-technical users to manage content.

4.2.3 Source Code Explanation

- **Custom CSS and JS:** Managed through the Elementor and Code Snippets plugins, ensuring that styles and scripts are easy to update and maintain.
- **Plugin Configurations:** Settings within each plugin control specific functionalities, such as multilingual content (Polylang) and course management (LearnPress).

4.3 WordPress Front Office

4.3.1 Functionality

- **Authenticated Users:** Depending on their role, users can access specific functionalities:
  - **Admins:** Full access to all courses, quizzes, and site settings.
  - **Trainers:** Can edit and manage their own courses.
  - **Trainees:** Can enroll in and complete courses, access course materials, and obtain certificates.
- **User Profile:** Trainees can manage their enrolled courses, answered quizzes, certificates, and personal settings.
- **Public Access:** Informational pages such as About, Contact, FAQ, Terms of Use, Handbooks, Webinars, and Cookies Policy are available to all users.

4.3.2 Evaluation

- **User Experience:** The front office is designed to be user-friendly, with clear navigation and access to key features.
- **Engagement:** Interactive elements like quizzes and certificates enhance user engagement and learning outcomes.

4.3.3 Source Code Explanation

- **Elementor Builder:** Used extensively for the layout and design, ensuring a WYSIWYG experience. This makes it easier to create and manage content without needing extensive coding skills.
- **LearnPress Integration:** Manages course content, quizzes, and certificates, with customization options available through the LearnPress plugin settings.

4.4 Additional Functionalities

4.4.1 Functionality

- **Accessibility by UserWay:** Enhances accessibility options for users with disabilities, providing tools to adjust font size, colours, and other visual elements.
- **All-in-One WP Migration:** Enables effortless Website Application migration and backup, particularly useful before updating major plugin versions.
- **LiteSpeed Cache:** Enhances website performance through advanced caching techniques and optimization tools.
- **Complianz | GDPR Cookie Consent:** Manages cookie consent to comply with GDPR regulations.
- **Download Monitor:** Manages downloadable files and tracks statistics.
- **Other Plugins:** Enhance various aspects of the Website Application, such as image optimization, event management, and multilingual content.

4.4.2 Evaluation

- **Performance:** LiteSpeed Cache and image optimization plugins ensure that the Website Application loads quickly and efficiently.
- **Compliance:** The Complianz plugin helps the Website Application adhere to privacy regulations, enhancing user trust.

4.4.3 Source Code Explanation

- **Plugin Configurations:** Each plugin has its settings and configurations that control its functionality. For example, LiteSpeed Cache settings manage how scripts and styles are optimized, while Complianz settings handle cookie consent configurations.

4.5 Summary of Remarks

The TRUST-FOOD Website's Application architecture is designed to be scalable and user-friendly, catering to the needs of administrators, instructors, and trainees. The integration of various plugins and custom code ensures that the LMS is not only functional but also optimized for performance and accessibility. The systematic use of Docker for environment consistency and the daily VM backup strategy highlight the emphasis on reliability and data protection. The utilization of the Elementor builder guarantees a WYSIWYG experience, allowing non-technical users to easily design and manage the Website's Application layout and content. This comprehensive approach ensures that all aspects of the Website Application work together seamlessly to provide a robust and effective learning platform.

5. Conclusion

In conclusion, this documentation has provided a comprehensive overview of the implementation procedures for both the Front Office and Back Office subsystems of the TRUST-FOOD Website Application. By detailing the development process and offering guidance for the code segments, workarounds, and subsystem functionality evaluations, this document serves as a valuable resource for supporting seamless knowledge transfer and ensuring efficient system maintenance.

Moving forward, this documentation will continue to empower future programmers with the necessary insights to navigate and enhance the system effectively. By documenting the development procedures and providing clear guidance, this support document contributes to the longevity and reliability of the TRUST-FOOD Website Application, enabling it to adapt and grow in alignment with evolving technological and business requirements.

Ultimately, this document not only preserves the rationale behind critical decisions but also serves as a foundational resource for sustaining the system's operational excellence over time.