

# CMS Certified Developer 10 LTS

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## Core Architecture & APIs

### Digital Assets Management (FAL)

Know about transparent inclusion of external file sources into TYPO3.

### PSR-7: Request/Response

This skill covers the PHP standard for HTTP request/response objects.

### XLIFF

Understanding XLIFF.

### Using Query Restrictions

How to restrict database queries.

### Using the QueryBuilder

How to write queries in TYPO3.

### Doctrine DBAL

Basic knowledge about the Doctrine component for transparently accessing several DBMS in PHP.

### PSR-3: Logger Interface standard

Knowledge about the PSR-3 logging standard for PHP.

### Flexform Configuration Data Structure

How to create and configure a data structure for my plugin's configuration.

### Flexform Concepts

Basics about the concept of Flexforms and how it relates to the TCA.

### Database Management System (DBMS)

Knowledge about DBMS.

### Logging API

Knowledge about the logging API provided by TYPO3.

### Accessing Flexform Data

Using data provided by Flexforms, in plugin CEs and custom records.

### TYPO3 Debugging Utilities

Knowledge about debugging utilities provided by TYPO3.

### Tracing Errors in Logs

Knowledge about log sources and how to utilize them in order to resolve errors.

### Knowledge about Environment Error Logs

Ability to locate logs provided by system components.

#### Debugging in PHP

Basic knowledge about error tracing possibilities present in PHP.

#### Extending site configurations

This skill covers custom extensions to the TYPO3 Core Site configuration module.

#### Route Enhancers

This skill covers route enhancers which are used to amend the URL routing provided by the TYPO3 core.

#### Request processing with middlewares

This skill covers the usage of PSR-15 middlewares in TYPO3 - both for frontend and backend request processing.

#### PSR-15: Middlewares

This skill covers the PHP standard on middlewares.

#### The Registry API

This skill covers the registry API, provided by the TYPO3 Core to store instance-specific data.

#### Environment class

This skill provides knowledge on the Environment class in the TYPO3 Core, which is used to abstract away system-specific details to create code that runs in multiple environments.

#### MetaTag API

This skill covers the MetaTag API, which can be used to manipulate the meta tags in the <head> section of the generated HTML page.

#### PageTitle API

This skill covers the PageTitle API, which can be used to flexibly modify the title of the generated page, e.g. in the single view of a plugin.

#### Contexts & Aspects

This skill covers two new concepts in TYPO3 v9: the request context and aspects that can be used to enrich this context, e.g. with localization information.

#### PageRenderer

This skill covers the PageRenderer, a TYPO3 Core component that is responsible for collecting and generating information about various parts of the page and handling the final output of a page.

#### Writing and using own Symfony Expressions

This skill covers the Symfony Expression syntax used in e.g. TypoScript conditions and ways to extend that functionality with custom code.

#### DataHandler

This skill handles basic knowledge on how the DataHandler, a TYPO3 Core component for processing user data, works and how it can be leveraged in own extensions.

#### Error handling/Exception handling

This skill provides knowledge on TYPO3-specific ways of handling errors during program execution and finding information about any errors that occurred.

#### Mail API

This skill covers the TYPO3 Mail API, which internally uses Symfony Mailer and MIME for email creation and sending.

#### Flash Messages

This skill covers flash messages, a mechanism used to communicate results of an action to the user.

#### Extension scanner

This skill covers the Extension Scanner, which extension authors can use to detect possible problems in their extensions while upgrading them to a newer TYPO3 version.

#### Symfony CLI

This skill covers the creation of command-line commands for TYPO3, based on the Symfony Console component.

#### The USER/USER\_INT TypoScript objects

This skill covers the USER and USER\_INT TypoScript objects, which are used to integrate custom code in the TYPO3 frontend rendering process.

#### The Caching Framework

This skill covers the Core's caching framework. It shows how to use existing caches and register custom caches and the types of cache frontends and backends. Additional topics are expiration and tagging of cache entries and flushing of caches.

#### Data structures in TYPO3 core

Classes for data structures, e.g., the BitSet and Enumeration class, and their usage.

#### TYPO3 Version API

The TYPO3 Version information API.

#### AssetCollector class and view helpers

The AssetCollector class, its methods and the corresponding view helpers.

#### PSR-11: Symfony Dependency Management/Injection

This skill covers different types of dependency injection in TYPO3 and the configuration of dependency injection.

#### Database Record Translations

This skill covers the translation configuration of database records via TCA.

#### Custom Route Enhancers

This skill covers the creation of custom Route Enhancers for the TYPO3 frontend routing.

#### Building Custom Dashboard Widgets

This skill covers creating custom widgets for the TYPO3 Backend Dashboard and configuring existing widget groups.

#### Rich Text Editor API

Modifying CKeditor's configuration programmatically: You can modify existing or add complete new configurations

#### Native List Pagination

The new list pagination introduced in TYPO3 V10.

#### Backend Notifications

The focus of this skill is to know how to utilize notifications for backend users.

#### Notification Actions

This skill refers to a new feature introduced in v10 which allows to define actions for notifications.

#### PSR-17: HTTP Message Factories

This skill covers the PHP standard for HTTP message factories and the differences to the earlier HTTP request/response standard.

#### PSR-18: HTTP Client

This skill covers the PHP HTTP client standard.

#### Debugging PSR-14 Event Handling

This skill covers debugging the registration, dispatching and handling of events.

#### Using existing PSR-14 events

This skill covers the implementation and usage of events in the TYPO3 Core.

#### Providing own events

The focus of this skill is providing custom events within the TYPO3 PSR-14 implementation.

#### JavaScript Event API in the Backend

This skill covers the JavaScript API for Events in the TYPO3 Backend, relevant for programming custom backend modules and extending existing modules.

#### Extension: Lowlevel

The lowlevel extension allows examining the current TYPO3 configuration.

## **Building Plugins/Modules with Extbase**

#### Implementing Custom Validators

How to provide custom validation in Extbase.

#### Error Actions

How to handle validation errors.

#### Validation in Extbase

What concepts exist to validate controller action input parameters.

#### Extbase Persistence

How Extbase interacts with the permanent storage.

#### Implementing ViewHelpers

Provides the foundations for extending a view with custom PHP code.

### Extbase PersistenceManager

The built-in PersistenceManager.

### Extbase Request/Response

How request/response handling is done in Extbase.

### Customizing Extbase Repositories

How to implement custom persistence functionality in Extbase.

### Standard Extbase Repository

Knowing the default repository class.

### Extending Base Models

This skill covers the use cases and different ways to extend the built-in models of Extbase.

### Extbase View

Explaining the view part of MVC in Extbase.

### Implementing MVC in TYPO3

Introducing the concept of MVC in Extbase: base classes for models, controllers, repositories; the concept of services and utilities and when to use them.

### Controller

This skill covers controllers, the "C" in the MVC pattern.

### Extbase Annotations

This skill is about PHPDoc annotations particular to Extbase.

### Registering Backend Modules

This skill covers the registration of a backend module to make it available to users.

### Registering Frontend Plugins

This skill covers the registration of a frontend plugin to make it available to users.

## **Templating and Other Outputs**

### Extbase JSON View

The built-in JSON View in Extbase.

### JSON

The JSON format and its usages in web development.

### ViewHelper: Debug

Utilising output to access Fluid variables.

### ViewHelper: Image

Using the Fluid ViewHelper `f:image()`.

### ViewHelper: Widgets

Learn the most important `f:widget.*` ViewHelpers.

#### ViewHelper: Format

Using Fluid Format ViewHelpers.

#### ViewHelper: Form

The TYPO3 CMS form ViewHelper for Fluid.

#### ViewHelper: Link, Uri

Using the Fluid ViewHelpers `f:link.*` and `f:uri.*`.

#### ViewHelper: Comment

Including comments in Fluid templates.

#### ViewHelper: If/Else

Creating if/else statements within Fluid templates.

#### ViewHelper: For-Loop

Iterating through a list with the for ViewHelper.

#### Templates, Layouts, Partials

Fluid Templates, Layouts, Partials - their interaction and properties.

#### ViewHelper: Render

Using `f:render` to render sections and partials as well as passing arguments.

#### Importing ViewHelpers

Using third party ViewHelpers in your Fluid templates.

#### ViewHelpers

Getting to know what a ViewHelper is.

#### Outputting Variables

Basic usage of variables inside Fluid templates and knowledge about escaping.

#### Extbase Fluid View

The Fluid-based HTML view of Extbase.

#### Using the Fluid View

Knowing and understanding the different parts of a Fluid template view.

#### What is Fluid?

Definition of Fluid and its possible use with regards to the Model View Controller pattern.

## Security

#### User Input in Views

Knowledge about securely outputting values gained through user input.

#### User Input in DB Queries

Knowledge about securely processing user input for database queries.

#### User Input in PHP Code

Knowledge about securely processing user input in PHP code.

#### Handling User Input

Knowledge about possible ways to retrieve and process user input.

#### Web Vulnerability Types

Knowledge about possible vulnerabilities in web development.

#### Prepared Statements

This skill covers the concept of and reasoning behind Prepared Statements in relational databases.

## General Extension Architecture

#### Table Configuration Array (TCA)

Configuring database tables for usage in the backend and frontend.

#### Database Schema Definition

This skill handles definition of own database tables and fields for an extension for automatic management by the TYPO3 Core.

#### What is SQL?

Knowledge about how to access and manipulate data in DBMS.

#### Extension File and Folder Structure

Knowing the file structure of an extension and where to place files by convention and due to technical requirements.

#### PSR autoloading standards

The different PHP autoloading standards (PSR-4, class maps), how they map PHP classes to files and folders, and how the PSR-4 autoloading is configured.

#### Update wizards

This skill covers the implementation of update wizards, which can be used by integrators to update existing extension data and configuration after upgrading the extension.

#### AJAX handling in the TYPO3 Backend

Basic knowledge about how AJAX actions are handled in the TYPO3 Backend and how custom code can be added to be called via AJAX.

#### JavaScript handling in the Backend

This skill covers the TYPO3-specific parts of RequireJS: how is it used in TYPO3 and how can I use the TYPO3 Core API to use my own JavaScript code in the TYPO3 Backend.

#### Composer for TYPO3 Extensions

This skill introduces usage of Composer for extensions and their integration into TYPO3 projects.

#### Creating Scheduler Tasks

How to build Scheduler tasks for automating recurring tasks.

#### Making Extensions localizable

How to make extensions translatable and localizable.

## Software Quality

### Coding Standards in TYPO3

Knowing how to write code conforming to the coding standards used by the TYPO3 project.

### Docblocks in PHP

The syntax and general purpose of documentation blocks, and the most often used annotations.

## Software Architecture for Extensions

### PSR Standards

Knowing the PSR programming standards.

### What is a Templating Engine?

Introduction to the basic concept of a templating engine/processor.

### PHP

Ability to develop and execute PHP scripts.

### Domain-Driven Design (DDD)

Understanding the concept of DDD.

### View

What is a view in MVC context.

### Model

What is a model in MVC context.

### What is MVC?

The MVC pattern, what it can be used for, and common implementations.

### Dependency Injection

Knowledge about dependency injection in general.

### PSR-14: Event Dispatching

This skill covers the basics of the PHP standard on Event dispatching.

## Building Plugins/Modules without Extbase

### AbstractPlugin

This skill introduces AbstractPlugin, the standard way of implementing extensions before Extbase.

## Package management

### Composer

Composer basics and its usage for PHP projects.

## Best development practices

### Git basics

Basics and most important commands for working with the version-control system Git.