

SAP Business Technology Platform Training for Professional (CAPM and BAS Included)

<https://www.anubhavtrainings.com/scp-cloud-platform-training>

CAPM | BTP | Spring Boot | Micro-Services | Security | Node JS | HDI | Docker | CI/CD | MTA | Git



Target Audience: You are working as an SAP consultant in companies. Now you see there is a shift in industry towards the cloud-based solutions. SAP BTP plays a critical role in the process of transforming to intelligent enterprise.

Prerequisites-Basic knowledge of Basic programming, Knowledge of database, SAP Basic knowledge, Basic knowledge of JS will be helpful.

Duration: 50 Hours – A promise of no copy paste

▶ What you get by joining our training

- 40 Hours of Detailed Lecture with Videos
- Support for issues and deployment
- Presentation and Whiteboards
- Real-time project Experience
- Exclusive Access to our GIT Repository with more than 15+ Projects
- Best-in-class cutting edge content
- Hands-on Exercises
- Latest concepts on Business Application Studio and VS Code
- End to End development using Cloud Application Programming Model (CAPM) in BTP
- HANA Cloud Covered for development

Our Course Page:

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▶ About the Course

In this Learn SAP Cloud Application Development (CAP) Model Course we have covered SAP CAPM (Cloud Application Programming Model). CAPM provides you a set of Library, Language, Tools, and Framework to Build Apps in the Cloud. You will learn end to end application development on Business Application Studio for a full-fledge application with Database, Services (v2 and v4 OData), Business logic, Fiori Application using Fiori Elements with annotations, Cloud Foundry Security and HANA Integration in Cloud.

▶ In this Training of Business Technology Platform, we will:

- First, we will start with a short theory to understand what to expect
- Then we will set our Development environment for CAPM dev and install NPM Repo to use CDS Command from @sap/cds-dk module
- Then we will get starting with creating some Purchase order app and test in local env with VS Code
- After that, we will take our use-case of the EPM Model and create a Entities with Complex Relationships and create CSV sample data to upload in Cloud
- We will then create a set of OData V2 and V4 Services to read all the Purchase Order and Items data. In this case, we will use sqlite3 DB to test result locally
- After that, we will add Annotation to our Purchase Order, Items, Business partner entities so, in Fiori® Preview we can see Data in App
- Once we have developed our services, we will go and separate the UI part of the code and create a Fiori List Report App with Business Application Studio, which contains information about routes, uses data model from service and adds UI annotations to service.
- Learn Latest Concepts of BAS with annotation modeler, Page Map, Settings Dialog, Theme Builder, Launchpad integration and more...
- After that, we will test the end-to-end scenario on Business application studio with CAPM
- Understand the draft capability and implement CURD operations with Real time scenarios'
- Handle custom logic, extensions, Actions, Functions, and Generic handlers to extend app
- Now, it is time to launch our app in SAP Cloud Foundry. We will create an HDI container and this time with the DB artifacts we will see our structure get created and also data gets added. Learn how to setup free SAP HANA Trial instance for multi-cloud development with HANA
- We will push the final application in the cloud and test the final Fiori Launchpad and App with Cloud Portal service
- Build Side-by-side extensions exploring APIs from SAP Business API HUB
- Understand Yeoman templates provided by Anubhav Trainings to build app
- Secure application locally and with XSUAA in Cloud Foundry with Role Templates and Services
- Implement the xs-security.json to test service and app end points, integrate with S/4HANA APIs with destination service

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COURSE CONTENT (UNIT WISE)

Unit 1 – What is SAP BTP (Demo Session)

- Definition of SAP BTP and motivation
- Developer persona
- What is SAP CF
- SAP CF Architecture and services
- What is CAPM in BTP
- Course overview and planned phases
- A demo scenario to build end to end Fiori App in just 30 mins with CAPM

Unit 2 – CF Organization

- Difference between Cloud and On-premise
- Types of offerings in the Cloud – IaaS, PaaS, SaaS
- What is Pivotal Cloud Foundry
- Why Cloud Foundry – Support for Dev Lifecycle, Self-Healing, 12 Factor
- Setup of Cloud Foundry Account
- Customer view of CF Account
- Introduction to Global Account, Sub Account, Region, Dev Space
- Configure Free trial on SAP BTP
- SAP BTP Portfolio and Services

Unit 3 – Create your first App and deploy

- Under the hood of CF – Cloud Controller, Diego Core, Cells and Containers
- Why we need frameworks to develop apps
- Introduction to Spring Framework
- A Real time example for Spring – Laptop Manufacturer

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Unit 4 – Spring Boot Introduction (A Java based open-source framework)

- Understand STS tool
- Build knowledge on dependency management using maven
- Understanding first maven project for spring boot
- Spring Concepts – Containers, Configuration, Dependency Injection, Memory Context
- Basic Fundamentals of Java programming for beginners

Unit 5- Create First Spring based Service

- Understanding Client Server Architecture
- Create REST Based Service using spring
- Define Spring bean class for example scenario
- Create Spring REST Controller to create API
- Understanding spring annotations
- Using maven build to create war
- Run the spring project using built-in tomcat
- Test Your first REST API in the local system
- Test first API after Deploying to BTP

Unit 6- Connect Spring project to PostgreSQL and Test locally

- Understanding and installing Postgre SQL Database in local machine
- Add maven dependency on the driver for the database
- Create configuration to connect DB from Spring boot
- Understanding DB special configuration on DDL
- Types of DB Connection → JDBC and JPA

Unit 7- Working with CURDQ on Spring JPA

- Working with pgAdmin Tool
- Understand scenario-based design for Vendor Application
- Complex example of Vendor and Address Entities with relationships
- Implement the Bean for Vendor Application
- Understanding @RestController, @Bean
- Implementing JpaRepositoryCurd Interface

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Unit 8- Association in Spring API

- Understanding Entity Relationship
- Types of relationships between Entities
- Foreign key between tables with auto generation of IDs
- Constructor injection for dependent dataset
- Implementing Address Entity and Relationship
- Testing the API and Relation using POSTMAN
- Getting Data from API based on dependency

Unit 9- Build Fiori App for MS

- What is SAP UI5
- Understanding MVC Architecture
- Bootstrapping SAP UI5 from CDN
- Add webapp inside Spring project
- Working with AJAX in reusable SAP UI5 JS Code
- Load vendor data using SAP UI5 List Control

Unit 10- Deploy Spring App to CF

- Build the war package for spring and UI5 application
- Check the target folder for build artifact
- Use manifest.yml file for deployment descriptor
- Deploy to BTP and test the application
- Check the Build pack and Runtime version of app in CF
- Troubleshoot using CF LOGS command
- Understand the CLI tool for SAP BTP

Unit 11- CI/CD pipeline using Jenkins

- Introduction to CI/CD
- Create Jenkins Master in local machine
- Connect Jenkins to git account
- Use CF CLI to automatic build to CF
- Run Jenkins job and check the logs
- Test the deployment using CI/CF pipeline

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Unit 12- Working with GitHub

- What is Git and Git HUB
- Terminologies of git – The distributed Repository System
- Create your first git repository
- Configure STS to use git
- Create branch using git
- Push to git to share project with team

Unit 13- Backing Services in SAP BTP and Postgre SQL DB in SAP BTP

- Understanding the concept of backing services in SAP BTP
- Create a new instance of Postgre SQL Database
- Concept of VCAP_SERVICES environment variable
- Binding with Database instance at runtime
- Database Connection pool
- Entity Manager and Transaction Manager factory to connect to DB
- Concept of Spring Cloud, Eclipse link and Spring data JPA

Unit 14- Introduction to SAP HANA

- Understand the In-memory Computing Engine
- Terminologies of HANA – High Performance Analytic Appliance
- Row v/s Column Store
- Create your HANA Cloud Instance in BTP
- Working with HANA Database Explorer
- Create HDI Container and work with HDI Owner and User

Unit 15- Spring Boot with HANA

- HANA Driver and dependency on Maven
- Multiple techniques to connect HANA to Spring based projects
- Create DDIC tables using HANA SQL Console in containers
- HANA VCAP_SERVICE instance variables
- Maintain connection settings in Spring project
- Binding service instance and run spring project on HANA Container

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Unit 16- Spring HDI Container

- Connect to HANA using HDI User
- Bind instance of runtime app with container
- Use CF CLI to check service binding
- Check permissions to connect to HANA instances
- Troubleshoot connection issues using CF LOGS command
- Monitor data inflow and outflow using HANA Data Explorer tool

Unit 17- CRUD with HDI

- Implementing POST Request in Spring
- Use spring persistence API to implement PUT and DELETE
- Test APIs locally using POSTMAN tool\
- Redeploy to CF connecting to HANA HDI
- Test APIs and UI to CRUDQ data in HANA with Spring boot

Unit 18- Introduction to OData Services & Olingo

- What is OData Services
- Service types – OData V2 & OData V4
- Working with OData operations \$filter, \$count, \$top, \$skip, \$expand
- Updated design for OData Support
- Benefits of using OData Services
- Introduction to Apache Olingo Framework
- Adding Olingo dependencies

Unit 19- Fiori App with OData using JAVA

- What is Git and Git HUB
- Terminologies of git – The distributed Repository System
- Create your first git repository
- Configure STS to use git
- Create branch using git
- Push to git to share project with team

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Unit 20- XSUAA and Security in BTP CF

- Difference between Authentication and Authorization
- Cloud Security
- Creating instance of XSUAA Service
- Purpose of **xs-security.json** file
- Introduction to IDP – Identity Providers
- Process of Implementation using XSUAA

Unit 21- Working with App Router and purpose of Routing

- Understand Purpose of Single Entry point for microservices
- Communication to XSUAA for security
- Use of **xs-app.json** file
- Working with JWT Token (JSON web token)
- Purpose of **@sap/approuter** module
- Understanding App Router Concept
- Push to git to share project with team

Unit 22- Basics of Node JS

- What is Node JS
- Setup of development tool for building Node JS App
- Setup VS Code in local system with Node JS
- Understanding Basics of JS
- Functions in JS
- Node package manager with **npm install**, **npm init** commands

Unit 23- Asynchronous behavior of Node JS

- What is synchronous v/s Asynchronous programming
- Handling Asynchronous behavior using Callbacks and Promises
- Access Global node js Modules
- Initialize node project

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Unit 24- Express Server using Node JS

- Understand express module in Node JS
- Setting up express project
- Adding express dependency
- Service express based API
- Service static content using express
- Understanding challenges and security
- Using passport module for JWT token parsing

Unit 25- Express Middleware Concept

- Working with express **middleware**
- Static express middleware to serve UI5 resources
- Serving the JSON using middleware
- Plug the middleware to boost app development

Unit 26- Application Router Implementation

- Setting up SAP Application Router with Node project @sap/approuter
- Working with manifest.yaml and xs-app.json
- Define configuration for routing to the correct microservice
- Routing point to SAP UI5 static resources
- Routing with Node JS based microservice
- Authentication redirect to xsuaa

Unit 26- Node Application to Consume HANA

- Using Node dependency for HANA Connectivity
- HANA Driver node dependency and configuration
- hanaxs module to working with HANA CURDQ
- xsjs compatibility layer using node JS
- Secure data using HANA based APIs
- VCAP_SERVICE variable read for HANA Connection
- Publish the service to BTP

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Unit 27 - CAPM day 1

- Basics of CAPM
- Dev tools used in CAPM like BAS (Business Application Studio) and VS Code
- Why CAPM?
- Challenges faced by developers in Cloud Development
- @sap/cds-dk for Developing CAPM Apps
- Understand cds based development model
- Create first CAPM services and implementation
- CDS (Core Data & Services) run and cds watch commands
- setup local VS Code and cds plugin

Unit 28 - CAPM day 2.

- Create first DB table using CAPM and Deploy
- Understood namespace concept for creating objects
- create context and table entity
- Install SQLite DB in local machine
- VS code to develop DB table
- CSV import for data
- Real time EPM use case.
- Connect to DB, install sqlite command line @sqlite3 DB
- Foreign key b/w entities
- cds deploy command with cds deploy-----to sqlite:
- Connect and test DB object.
- Reusable types in CDS and using Clause
- understood CDS compile

Unit 29 - CAPM day 3

- cds aspects for guide and management using {managed} from @sap/cds/command entity tab: management
- Translation of texts with CDS Text Table and Language Keys
- Create first OData service - V4 Services with CAPM CDS
- Experience the fiori preview of the app
- Working with CDS abstract entity

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- Injecting validation format
- Understanding associations
- Creating Enumerators
- Exposed associations.
- Reuse of own cds in another cds

Unit 30 - CAPM day 4

- Test Your service locally using POSTMAN
- Association & exposed Association in CDS Views
- Introducing BAS (Business Application Studio)
- Create DEV space - A VM approach for developing Apps
- Replicate Code from vs code to BAS to run CAPM apps
- Run test service
- Test service in BAS
- Extending i18n for field label
- Test services in BAS using HTTP file CRUD operations testing
- Connect to SQLite DB, and use password.

Unit 31- CAPM day 5

- Handling language specific texts with location options
- Updating Import data and testing
- create first cds view for value help
- Create aggregation view
- Create view with **mixn** approach - CDS Views in CAPM
- Publish and test services
- Fix for following issues
 - * Date format
 - * Round for numbers
 - * Bank field length
 - * Git bash
 - * Adding git bash script to BAS

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Unit 32 -CAPM day 6

- Create http file to test Request from BAS
- Test CRUD with GET, POST, PATCH, DELETE
- Passing key to test PATCH
- Read single entity and expand
- @Capability annotations in CDS for Adding Hook functionality
- Updating currency tables for Conversion in the schema
- Understanding generic handlers on, before, on after
- Adding data actions and implementation
- Adding hook methods for entity after READ
- Create entity function
- CDS transactions to enable Draft and CRUD Functionality in Fiori
- Create custom functions in CDS
- What is transaction in cds?
- Understanding documentation

Unit 33 - CAPM day 7

- Implementing custom generic handlers for "on"
- Validation of data using before, "CREATE" handling
- Debugging (Run start debugging)
- Test OData service and metadata
- Test actions and functions in the services
- Secure application using local security
- Get user info

Unit 34 - CAPM day 8

- Introduction to Fiori Elements
- Setup basic project- CAPM Based Development
- Explain scenario
- Configure list report with search fields and tables
- Understand **@UI.selection** field and **@UI.lineItem** annotations in Fiori Elements
- Extend annotations cds to create object page **@UI.Facets** and **@UI.Identification**
- create object page with facets and field groups with **@UI.FieldGroup**
- Configure navigation from list report to object page

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- @UI.Lineitem annotations to add table columns of different kinds with @UI.datapoint

Unit 35 - CAPM day 9

- Understand Page map tool
- Generate manifest and route configuration for level 3 nav
- Working with Fiori Page Map
- Integrating custom action boost
- Using latest Fiori dark theme sap_fiori_3_dark
- Enable Fiori Application draft enabled
- Working with Composition in CDS for Line Items
- Enable using @cds.draft.enable for CURD operations

Unit 36 - CAPM day 10

- Understanding composition for item level CRUD
- Fixing issue for product set data
- Value helps in Fiori applications - F4 Helps
- Automatic ID generation with uuid CDS generator
- Built on code list for search helps
- changing layout to flexible column layout using BAS Page Map
- Fiori animations to add effects
- Define Field groups with data fields and line items
- Adding Icons to the application
- Show meaningful Information to the users

Unit 37 - CAPM day 12

- Understand Why Fiori Elements
- Difference between Fiori Element v/s Freestyle App
- Adding Value Help Annotation
- change/fix data model issue
- Show text along with technical keys
- Support for built in currency, country type
- Implementing deep inserts with item data
- Enable PO items creations

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- Entity composition to support Fiori deep Inserts

Unit 38 - CAPM day 13

- Connect purchase order application to HANA DB
- Start SAP HANA on cloud instance - HDI Containers
- Connect to HANA HDI using the HANA Database Explorer
- Understand **mta build** command time tool
- add **mta.yaml** to the app
- Integrate modules and dependencies
- Add required modules
- Build **mtar_archive**
- Deploy app to cloud foundry
- Add managed XSUAA service with xs-security.json
- Test application after ending app router

Unit 39 - CAPM day 14

- Create XSUAA backing service entry
- Add dependency on passport module
- Enhance ap router with XSUAA security
- Create local Authorization configuration test security in business application studio
- Enable force authentication on cds definition
- Add role requirement to cds
- manage attributes and row level security
- create role collection in BTP
- Assign attribute value to the role in BTP
- Test row level security with BTP deployed app

Unit 40 - CAPM day 15

- Introduction to side by side extension scenario with S\4 HANA
- understand API hub and SAP offer APIs
- explore API groups and types
- setup SAP cloud connector
- configure BTP trial with cloud connector
- create and test connection destination in BTP
- Maintain on-premise system in CC

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Unit 41 - CAPM day 16

- introduction to side-by-side extensions cloud SDK for node
- why S/4Hana cloud SDK for node.js
- initial setup
- consume external service Northwind in CAPM
- consume EDMX files to create CSN
- create connection to API HUB
- Consume API_SALES_ORDER from S4Hana in CAPM
- CPM, cloud SDK, API HUB, extension working
- connecting to destination service
- maintain destination in destination service
- Build Fiori UI on middleware S4 Hana app
- package and deploy the app

Unit 42 - CAPM day 17

- CI/CD service in SAP BTP to create pipeline
- Maintain destination for QLT and PRD account
- activate cloud transport management service
- configure service keys for TRM
- create credentials book from git
- maintain transport routes
- create all management service instance
- Configure operation, action, events to trigger notification
- Git push and test CI/CD end to end

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