

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

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

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

Each unit is approximately 2 hours 25 Units X 2 Hours = 50 Hours of content, Videos might not be in exact order as per below content but all topics are covered.

▶ 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
- 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 (Not XSA)

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 Native Cloud Application in the BTP platform. 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 along with S/4HANA Cloud Extension using Cloud SDK for Node JS.

▶ 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 sqlitedb3 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 CRUD 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 App with Build workzone 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 using SAP S/4HANA cloud SDK for Node JS
- Complementary videos on BTP development using Spring boot on Java

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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 BTP 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
- Type of BTP Subscriptions – BTPEA, CPEA, Pay-as-You-Go, Trial
- 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
- Working with CF CLI
- Using **cf push** command with manifest.yml
- Understanding application scaling – vertical and horizontal scale
- Start/stop applications using CF environment
- Understanding BTP service discovery to estimate cost of your BTP account

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Unit 4 – Microservice Architecture & Basics of Node JS

- Microservice Architecture
- Understanding microservice using Real-world example
- 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
- Advance node js functions like Arrow functions, map, splice, reduce etc.

Unit 5- Asynchronous behavior of Node JS

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

Unit 6- Express Server using Node JS

- Understand express module in Node JS
- Initialize node project using **npm init**
- Setting up express project
- Adding express dependency
- Service express based API
- Service static content using express

Unit 7 - 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
- Deploy applications to BTP Cloud foundry

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Unit 8 – Introduction to CAPM

- 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

Unit 9 – Getting started with CAP Development on BAS tool

- What is BAS tool?
- Dev space in BAS tool
- Setting up BAS tool with required modules
- 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 10 – Working with Database Modeling

- 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 with SQL

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Unit 11 – Reuse and Aspects with Standard @sap/commons

- 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
- Injecting validation format
- Understanding associations
- Creating Enumerators
- Exposed associations.
- Reuse of own cds in another cds
- CDS Views in CAP
- Using names which are case-sensitive

Unit 12 - Service modeling in CAPM

- Create first CAP service
- Using **cds add handler** command for service implementation
- Run test service
- Test service in BAS with .http files
- Create catalog service on top of DB model
- Make services @readonly
- Working with End points and exposed association
- Extending i18n for field label
- Test services in BAS using HTTP file CRUD operations testing
- Connect to SQLite DB, and use password.

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Unit 13- Advance database modeling and views

- 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 **mixin** 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

Unit 14 – Service modeling on DB models

- What is OData Services
- Service types – OData V2 & OData V4
- Working with OData operations \$filter, \$count, \$top, \$skip, \$expand
- 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
- Working with Deep insert and compositions
- @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?

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- Understanding documentation

Unit 15 – CDS Query language, Validations and Generic handlers

- 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 16 – Adding UI to the Application

- 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.Identificaion**
- create object page with facets and field groups with **@UI.FieldGroup**
- Configure navigation from list report to object page
- **@UI.Lineitem** annotations to add table columns of different kinds with **@UI.datapoint**

Unit 17 – Using Advance Fiori Development with Extension of Fiori App using Page Map

- 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

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Unit 18 – Fully ready Transactional App development for Purchase order and items with draft

- 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 19 – Working with Value helps, Default functions, Integrations of actions

- 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
- Entity composition to support Fiori deep Inserts

Unit 20 - HANA Cloud and HDI Containers, Run CAP app with Remote Database

- 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

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- 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 21 – Application Security and XSUAA, App Router

- 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
- Adding App router for token exchange
- Purpose of xs-security.json file
- Introduction to IDP – Identity Providers
- Process of Implementation using XSUAA
- 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
- 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

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Unit 22 – Source Code management, Attachments and Analytics

- Working with version management using git
- Push code to git hub
 - 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
- Sharing code between BAS and VS Code
- Design Analytic App with ALP on CAP
- Analytic Annotations for App
- Add Attachment functionality on CAPM
- Debugging CAP Apps

Unit 23 – Multi tenancy applications

- Create Multi-tenancy applications
- Understand what is multi-tenancy applications
- Advantage of multi-tenancy applications
- Create subaccount as tenant
- Deploy a app and subscribe to multi-tenancy applications
- Test the data separation for HDI Container level

Unit 24 – S/4HANA Cloud Extension

- 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

Unit 25 – Cloud Extension End to End deployment

- introduction to side-by-side extensions cloud SDK for node

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- 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 26 - CI/CD with SAP CI service and Cloud Transport management

- 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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