



PUBLIC

Custom Joule Skill & Agent in SAP Build SAP BPEM Agent

Configuration & User Guide

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Contents

Overview	3
Business Value & Benefits	5
Prerequisites	5
Configuration Guide.....	8
Setup Business Technology Platform Cockpit.....	8
Configure SAP S/4HANA Destination	8
CAP Service Details.....	9
User Roles Configuration.....	9
Services used:	10
Artifacts in the Agent:.....	10
Setup Content Package	11
Import Custom Joule Agent	11
Configuration & Modification.....	11
Release and Deploy the Project	11
Test the Joule Skills And Agent in SAP Build.....	12
Support.....	13



This document contains 2 sections. Each section covers different information about this template content package.

1. **Overview:** In this section, you will get quick overview of the use case, what are high-level components used and how the template works in nutshell. Prerequisite section provides information of different services of SAP Business Technology Platform that are required to use this template.
2. **Configuration Guide** It contain sections which will guide you to setup your (a) SAP Business Technology Platform Account with destination, user roles etc., (b) Links and steps to set up Joule studio and Joule (c) Import and configure the template using SAP Build Process Automation - Joule studio

Note:

1. This agent and documentation are intended for Business use. The content is designed to support real business scenarios and enterprise integrations.
2. This documentation does not provide a full end-to-end setup guide for all SAP Business Technology Platform services. It assumes that the IT administrator responsible for setup has prior experience with SAP Business Technology Platform and related services. The configuration steps outlined in this document must be followed as described.
3. This content is provided to accelerate enterprise solution implementation. Customers are expected to adapt and extend the agent, skills, and configurations based on their specific business requirements. Users should have a basic understanding of SAP Build Process Automation and its capabilities to effectively customize and operate the solution.

Overview

The **SAP BPEM Agent** is a conversational AI-powered Joule Agent built using SAP Build Joule Studio to assist utilities business users in managing Business Process Exception Management (BPEM) cases in SAP S/4HANA Utilities.

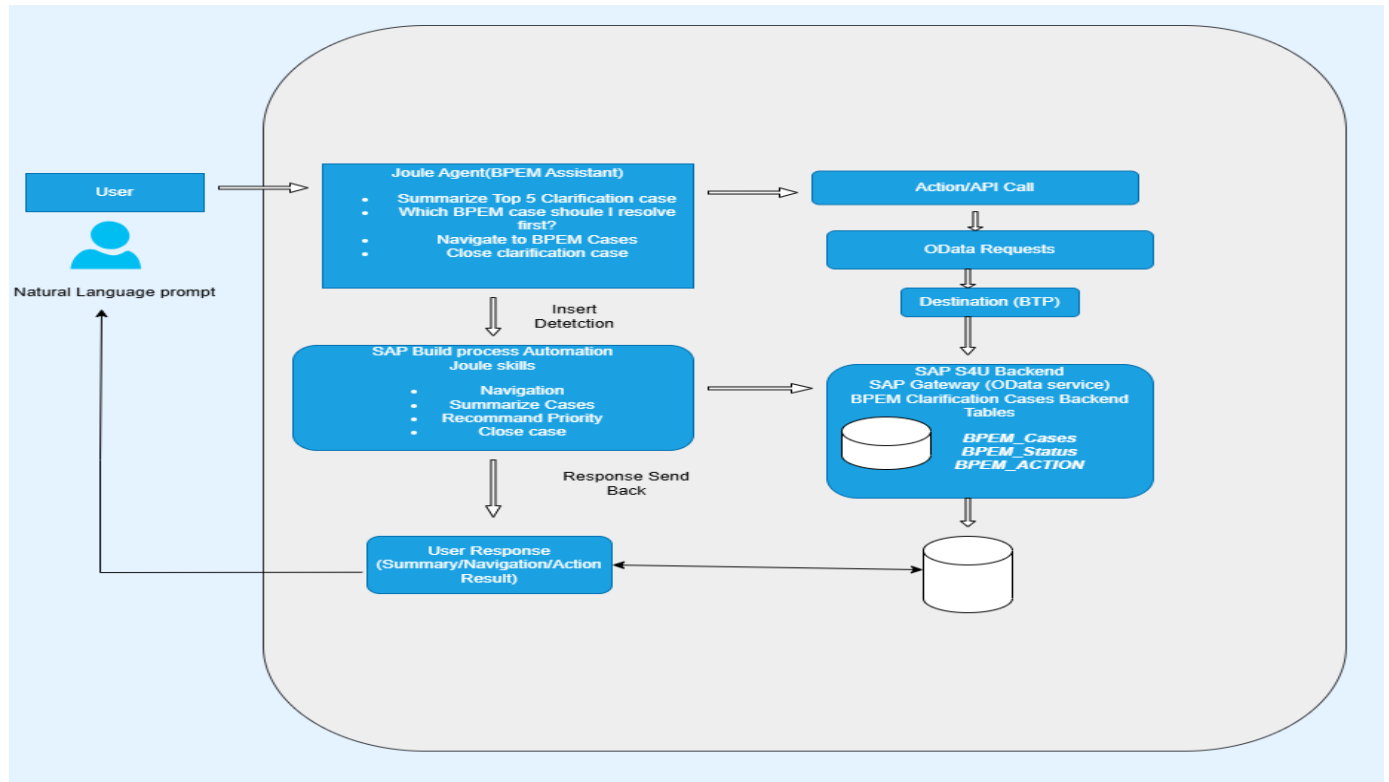
Utilities organizations handle many billing- and contract-related exceptions such as clarification cases, blocked contracts, billing errors, and outstanding billing items. Traditionally, resolving these exceptions requires users to navigate across multiple SAP applications and transaction screens, manually filter and prioritize cases, and perform repetitive operational tasks. This process is time-consuming, error-prone, and requires deep SAP functional knowledge.

The SAP BPEM Agent addresses these challenges by providing a single, conversational interface that allows business users to interact with SAP S/4HANA Utilities using natural language. Users can



ask questions to summarize clarification cases, identify the highest-priority BPEM cases, navigate directly to relevant billing and exception management applications, and perform operational actions such as closing clarification cases.

Solution flow:



1. The user submits a natural language query (e.g., summarizing clarification cases or closing a case).
2. The **SAP BPEM Joule Agent** interprets the request and identifies user intent.
3. The agent invokes the relevant **Joule Skill**.
4. The skill invokes the CAP service, which acts as middleware and fetches data from the SAP S/4HANA On-Premise system via OData services.
5. The agent receives and formats the response into a structured, business-friendly output.
6. Optional navigation guidance to the relevant SAP application is provided.

The list is then consolidated by Agent, and all the suppliers are displayed.

Business Value & Benefits

- Reduces time spent navigating BPEM and billing applications
- Improves visibility into high-priority exception cases
- Accelerate clarification case resolution
- Enables business users to act without deep SAP technical knowledge
- Provides standardized and guided exception handling workflows through conversation

Prerequisites

For this template to run successfully the following prerequisites are needed.

- Joule Studio in SAP Build
Follow the setup guide [here](#) based on your tenant configuration.

NOTE: If you need additional help with these prerequisites (such as setting up SAP Build Process Automation and SAP Build Work Zone), you can run the Discovery Center mission: [Setup Joule Studio for a BTP Enterprise Account](#).

- SAP S/4HANA On-Premise system
- SAP S/4HANA Utilities with BPEM activated
- SAP Business Technology Platform (BTP) account
- SAP CAP application deployed on SAP BTP acting as backend middleware
- OAuth 2.0 enabled for API access
- Required authorizations to access SAP S/4HANA OData services

Backend Agent Setup Instructions

1. Get the Code

- Download the backend CAP service ZIP file from SAP Search Agent dependencies.
- Extract the ZIP file.
- Open the extracted project in your preferred code editor.

2. Check Python Version

Ensure Python 3.10 or higher is installed:

Command: `python --version`

Note: For more information you can go through README.md



Prerequisites:

Import the openapi spec file that you have generated in sap-bpem-cap from the docs folder

3. Create & Activate Virtual Environment

Create the virtual environment:

Command: `python -m venv venv`

Activate it:

- Windows

Command: `venv\Scripts\activate`

- Mac / Linux

Command: `source venv/bin/activate`

4. Install Dependencies

Install required Python packages:

Command: `pip install -r requirements.txt`

5. Configure Environment

- Rename `.env.example` to `.env`
- Update the file with the required credentials and configuration values.

6. Run the Application

For Python

Command: `python server.py`

- The server starts locally
- The agent endpoint is exposed as:

POST /bpemagent

For CAP (Node.js)

Run Locally

Command: `cds watch --profile hybrid`



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- The CAP service runs locally
- Endpoint exposed as:

POST /bpemagent

7. Agent Behavior

- When POST /bpemagent is triggered:
 - The agent invokes the configured tool
 - The tool scrapes an external web source
 - Results are returned to the agent for display in Joule

Deployment & Destination Configuration

1. CAP Deployment to Cloud Foundry

Command: npm run build

Command: npm run deploy

- Note the assigned Cloud Foundry app route URL after deployment.
- For Binding the application with services use this command

Command: npm run bind

2. Create BTP Destination

In SAP BTP Cockpit:

- Create a Destination
- Type: HTTP
- URL: Cloud Foundry app route
- Authentication: As required (OAuth / Basic / NoAuth)

3. Joule Studio Integration

- Reference the created BTP Destination in Joule Studio
- The agent will invoke:

POST /bpemagent

through the destination.



Configuration Guide

Setup Business Technology Platform Cockpit

Configure SAP S/4HANA Destination

The SAP BPEM Agent interacts with SAP S/4HANA Utilities using an HTTP destination configured in the SAP BTP cockpit.

Note: The destination points to a custom CAP-based OData v4 service (chatservice). The SAP S/4HANA system is an On-premise system. CAP acts as the backend technology and middleware that fetches data from the On-premise system.

Destination Property	Value
Name	<Destination Name>
Type	HTTP
URL	https://<host>/odata/v4/chatservice
Proxy Type Internet	Internet
Authentication	OAuth2ClientCredentials
clientId	<ClientId>
clientSecret	< clientSecret >
Token Service URL	< Token Service URL >

NOTE: The Client ID, Client Secret, and Token Service URL are obtained from the **SAP BTP XSUAA service instance** bound to the CAP application. These credentials are generated via a service key and maintained in the SAP BTP destination for secure system-to-system authentication.

The /oauth/token needs to be appended manually in Token service URL when configuring destination.

Additional properties Table:

Additional propertie	Value
HTML5.DynamicDestination	true
WebIDEEnabled	false
HTML5.Timeout	60000
sap.processautomation.enabled	true
sap.applicationdevelopment.actions.enabled	true



TrustAll	true
authTokenType	Bearer
Timeout	60000

NOTE: Make sure the API used in this template (see the below sections to get the API name) is exposed with the correct communication scenario to the communication user.

Communication scenario: Business Partner, Customer and Supplier Integration (SAP_COM_0008)

CAP Service Details

The CAP service exposes business-oriented OData v4 APIs under the chatservice namespace and acts as a middleware between the Joule Agent and the SAP S/4HANA On-Premise system.

Note: For any requirements related to CAP service backend dependencies for SAP BPEM Agent, please reach out to **SAP_BTP_AI_AUTO@infosys.com**

- Service Name: chatservice
- Technology: SAP CAP (OData v4)
- Deployment Platform: SAP BTP (Cloud Foundry)
- Integrated Backend: SAP S/4Hana On-Premise
- Security: OAuth 2.0 via SAP BTP XSUAA

Prerequisites

Import external service .edmx file in srv/external and then, run the below command:

Command: cds import <file.edmx>

To convert csf file from the above command to openapi spec, run the below command(to be utilized in sap-bpem-python)

Command: cds compile srv --service all -o docs --to openapi

User Roles Configuration

To access and use the SAP BPEM Agent, the users need to have the roles as described [here](#).



Services used:

There is one Action project used in this Agent. They use different APIs/Services.

Note: The following APIs are exposed by the **custom CAP service (chatservice)** and internally consume SAP S/4HANA On-Premise OData services to perform BPEM operations.

Action Project Name	Service Used	Purpose
BPEM Case Management Actions	<i>/BpemCase</i>	Retrieve Business Process Exception Management (BPEM) clarification of case data including case status, priority, exception category, and billing context.
BPEM Case Action – Clarification Closure	<i>/closeClarificationCase</i>	Perform operational actions on BPEM clarification cases such as closing a case directly from the Joule Agent using natural language commands.

Artifacts in the Agent:

Type	Name	Description
Joule Skill	Summarize	Retrieve and summarize BPEM clarification cases
Joule Skill	Recommend Priority	Identify the next BPEM case to resolve
Joule Skill	Close clarification	Close clarification cases via conversation
Joule Skill	Navigation	Navigate to BPEM and Billing applications
Joule Agent	SAP BPEM Agent	Conversational agent for BPEM operations
Environment Variable	AICore_Client_ID	Client ID used to authenticate the



		application with SAP AI Core services.
Environment Variable	Client_ID	OAuth Client ID used by the CAP application for authentication using client-credentials flow.
Environment Variable	Hana_Cloud_Host	Defines the host address of the SAP HANA Cloud database used by the CAP service.

Setup Content Package

Import Custom Joule Agent

All imported custom agents are available in SAP Build Store. To know more about the SAP Build Store visit [SAP Build Process Automation Store](#).

This template can be downloaded from the SAP Build Store:

1. Navigate to the **Store** option in your SAP Build Lobby.
2. Select the **Project Type** filter as “Joule Agent and Skill”
3. In the Search bar type “**SAP BPEM Agent**”
4. Select the “Create from Template” button to add the template into your lobby.
5. Once the creation is complete, navigate to the Lobby to find the “**SAP BPEM Agent**” project is available for use.

Configuration & Modification

Once the Joule Skill & Agent project is added into the lobby, it can be run directly without any modification.

However, if you need to modify Joule skills that are used within the project or you want to modify the agent, with its instructions/additional context or other fields, you can do so.

In order to understand the various capabilities of Joule Studio and work with them please refer to the link: [Create AI Capabilities | SAP Help Portal](#)

Release and Deploy the Project

Once the agent is verified by the user / modified based on user need, it has to be released and deployed into a shared environment.

- Refer to the link below to create/Share an Environment:
[Environments | SAP Help Portal](#)
- Refer to the link below to release a project:



[Release a Project | SAP Help Portal](#)

- Refer to the link below to deploy a project:

[Deploy a Project | SAP Help Portal](#)

Test the Joule Skills And Agent in SAP Build

1. To access your projects, navigate to **Control Tower ->Tenant Configuration->Environments**.
2. Select your environment.
3. After deploying the project, the project should be seen in the Shared Environment.
4. Click on the Tab, '**Joule**'
5. Click on the button '**Launch**'

This will open the Joule launchpad where you can key in the below prompts in order to test the agent.

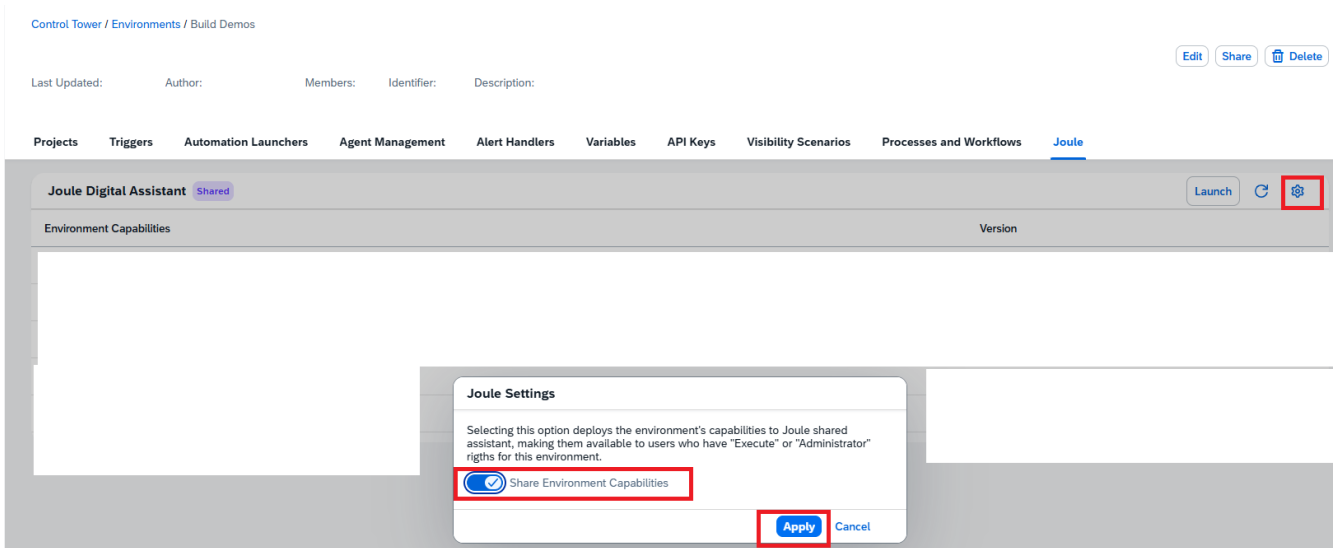
Prompt	Expected Result
Please Navigate to Billing errors Please Navigate to Outstanding billing Please Navigate to BPEM Cases Please Navigate to Blocked Contracts Please Navigate to Billing overview	The agent provides a navigation response or link that directs the user to the Billing Errors, BPEM cases, Blocked Contracts, Outstanding billing, and Billing overview application in SAP S/4HANA Utilities.
Can you summarize top 5 clarification cases which are Completed Can you summarize top 5 clarification cases which are New Can you summarize top 5 clarification cases which are In Process Can you summarize top 5 clarification cases which are Canceled	The agent returns a summarized list of the top 5 BPEM clarification cases with status "New", "Completed", "In process" and "Canceled" including case ID, priority, exception reason, and business relevance.
Can you tell me Which BPEM case should I resolve first? What is my priority?	The agent analyzes available BPEM cases and recommends the highest-priority case to be resolved first based on urgency, business impact, and case status.
Please close the clarification case <case number> Example: Please close the clarification case 1000001348	This will close/Remove the Bill block



NOTE:

1: Currently the Agent will be only deployed in the SAP Build environment and hence testing can also be done only in the Build Lobby. If you want to **activate the Joule in other systems** Eg: SAP S/4HANA or SAP Work zone, then click on the **settings** in 'Control Tower->Environments-><Your shared Environment that was created> ->Joule's

Here you have to switch the toggle on for '**Share Environment Capabilities**'.



Support

If you have experienced any issues or need any support related to SAP BPEM Agent with Artifact, or if you need to request the CAP service dependency used by this agent, please contact:

SAP_BTP_AI_AUTO@infosys.coms