Kaar CVE Dashboard

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Abstract - **Developing a full-stack application that allows customers, vendors, and employees to monitor and access their financial, HR, and commercial transactions that are connected to the firm. The key benefit of this project is that it allows three different demographic groups to access it simultaneously. Customer data related to sales orders may be accessed through the company, vendor data related to procurement issues can be accessed through the company, and employee data related to human related transactions can be accessed through the company. It has been integrated with SAP ERP. A kind of software known as "enterprise resource planning" is used by large corporations to manage a variety of everyday tasks, including accounting, purchasing, project management, risk management, compliance, and supply chain management.**

Keywords - SAP, PIPO, RFC Webservice,ExpressJS, AngularJS

I.   INTRODUCTION

Customers, vendors, and workers are the key users of the KAAR CVE dashboard. This application's major goal is to build a full stack application that allows three different target demographics - customers, vendors, and employees to access and examine their respective data. The consumer (buyer) has access to and may observe every commercial or financial transaction they have with the company. In a similar vein, the vendor (seller) has access to and can observe every business deal made between them and the organization. The employee has access to and can view any HR- related communications between the employees and the company. Customers, vendors, and employees can engage and access their business transactions within an organization through this one and only application. It combines three portals, namely the vendor, employee, and customer portals. The term "enterprise resource planning" refers to a category of software that big businesses use to oversee daily operations including accounting, purchasing, project management, risk management, compliance, and supply chain management. One of the most popular enterprise resource planning tools is SAP. In SAP, there are many modules. The customer portal for this application has been created so that users may understand the capabilities of the Sales and Distribution (SD) Module and the Finance Module. It is also made to keep track of all the information on the clients who conduct business with the company. The Material Management (MM) Module and the Finance (FI) Module functions are known through the vendor portal. It is also intended to keep track of all the vendor data used to conduct business within the corporation. The Human Resource (HR) Module and the Finance (FI) Module functionalities are known through the employee portal.

II.   TECHNOLOGY STACK

Due to the fact that it is a full stack application, there are three portals. The customer portal's technology stack consists of Angular and node.js (front-end), RFC web services (middleware), and SAP ERP (Backend). The vendor and employee technology stack consists of Angular and node.js (front-end), PI/PO (middleware), and SAP ERP (Backend).
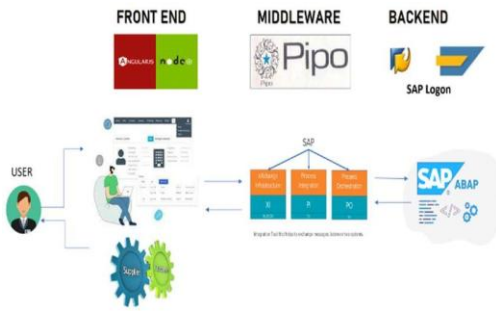
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Fig 1 Technology stack of CVE dashboard

A. AngularJS

A typescript-based development platform is called Angular. A component-based architecture for creating scalable web applications is one feature of Angular as a platform. a group of tightly integrated libraries that include a wide range of functions, such as client-server communication, routing, and form management. The project's whole user interface (UI)

was created using angular.js. The programme has a landing page that serves as the default page for users of the three separate domains, from which they can travel to the appropriate login page thanks to a navigation bar.

The login page has been built with input fields like user-id and password and a login button for the customer, vendor, and employee portals. The presence of the user-id in the customer portal, vendor portal, and employee portal will be checked in the standard table after entering the user-id and password and clicking the login button, after which the user-id and password will be checked in the custom table of the relevant portals.
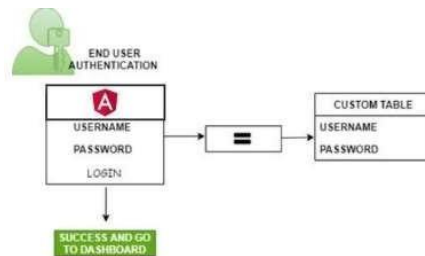

Fig 2 Login validation workflow

The customer-id for the customer portal will be sent over RFC web service to the SAP-ERP system. The answer will be delivered back to the login page with the validation result once the customer-id has been verified in the SAP-ERP system. The customer will be able to access the customer dashboard after the validation is successful. The end-to-end transactions between the company and the logon customer have been established and designed into the customer dashboard. It contains all of the sales information associated with that client, including the customer's profile, enquiry, sales order, list of deliveries, invoice, payments received, and ageing, as well as credit and debit memos.
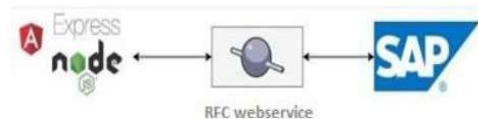

Fig 3.2 Overall process of customer portal

The SAP ERP system will get the vendor-id and employee-id for the vendor and employee portals via the SAP PO interface. The vendor login page will receive a response with the validation outcome once the vendor-id and password have been verified in the SAP ERP system. The vendor will be able to access the vendor dashboard if the validation is successful. Similar to this, the SAP ERP system verifies the employee ID and password. The response, together with the

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verification outcome, is then delivered back to the employee login page. The employee will be permitted to access the employee dashboard if the validation is completed.
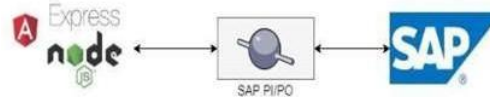

Fig 3 Overall process for vendor and employee portal

B. SAP RFC Web Service

The SAP ERP Portal and the SAP Database are connected using middleware called the SAP RFC Web- service. The RFC function modules are to be used to establish a connection to a web service. The adapters offer end-to-end connectivity between the database and application. Connections between SAP systems as well as SAP systems and non-SAP systems are included in the communication between applications of various systems in the SAP environment. The Remote Function Call (RFC) standard SAP interface is used for inter-SAP communication. A function in a distant system is called by an RFC. There are now numerous distinct RFC variations available, each of which has unique characteristics and serves a particular function.
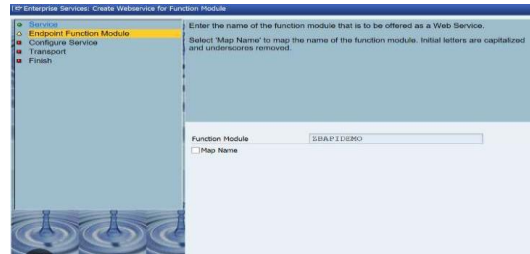

Fig 4 Creation of web service

RFC web-service creation involves the following steps: After building the FM in the backend, selecting "Create Web-Service" from the context menu will be available. After clicking, enter the name of the service definition and choose Authentication with user and Transport Guarantee for the profile field. The web service has now been developed. Enter transaction code for setting the web-service that was generated in the backend and then navigate to soamanager. Provide the web-service service name that has been generated in the backend and authenticate with your login and password. When configuring, use SSL (https), which is more secure than http, for transport level security. As User ID/Password, provide channel level authentication. By

launching Open Binding WSDL Generator, collectWSDL links.

C. PI/PO

The application integration middleware programme known as SAP Process Orchestration (PO) was created by SAP. The SAP Netweaver platform, which enables interaction between SAP and legacy applications or other external systems, includes SAP PI as a part of SAP PO and SAP PI. The integration application's first iteration was called XI (Exchange Infrastructure). The most recent version of the application, Process Orchestration, was released after SAP Process Integration (PI) (PO).When linking SAP systems with other SAP or non-SAP systems, users can develop synchronous and asynchronous communication with the use of SAP PO. Within the IT architecture of an organisation, it facilitates the creation of interfaces between diverse systems and plays a crucial role in integration and monitoring. The establishment, integration, and monitoring of interfaces between heterogeneous systems in IT architecture is crucial for a company.
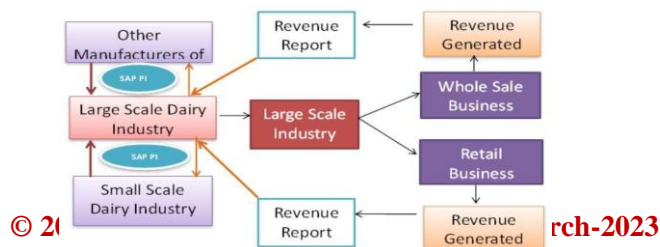
Fig 5 workflow of PI/PO

Using SAP Process Orchestration (PO), business processes can be automated and improved. It combines the capabilities of SAP Process Integration (PI), SAP Business Rules Management, and SAP Business Process Management (BPM) (BRM). It incorporates all the tools necessary for application integration and is a more sophisticated version of SAP PI. The integration of SAP and non-SAP applications is handled by a group of components collectively known as SAP PI, which is not a single component. This SAP PI component architecture is used during design, configuration, and runtime. The Enterprise Services Repository has a wide variety of parts. Software Component Versions, which are imported from the SLD, serve as the foundation for all development. The creation of namespaces is the next step. You can place your development at this location. SAP PI's various parts include System Landscape Directory: Within a system landscape, it serves as the primary information provider. Component Information (Installable & Installed) and

Landscape description are the two categories of information included in SLD. Enter the name of the service interface (In - Inbound in this case), and by default, the software component version and namespace value will be used. Press the Create button. Enter the Inbound category and the Synchronous or Asynchronous communication method in the Inbound Service Interface. Drag the message type from the left pane to the service interface inbound request message as shown below to specify it. The Save button is located at the top. After entering the mapping name, click Create as indicated above. Establish the source and target messages now. Drag the message from the Message Type section to the mapping section's source and target message. Now, map these messages using the mapping options that are accessible. When you choose a function from the drop-down menu, you can view the various possibilities that are offered under each tab. You want the whole name to appear in the target file even though the source file only contains your first and last names. Under the Text function, you can utilise Concatenate here. Set the message mapping to active. Enter the name of the operation mapping, then click the Create button to create it. You must input Source Operation and Target Operation in the following window. From the left pane, drag the Service Interface to the Source and Target Operations. Both the inbound and outbound service interfaces will be dragged to the target and source operations, respectively. As seen in the accompanying screenshot, drag the Message Mapping to the Mapping Program option. Click the Save button at the top once you've made these adjustments. Integration repository is used to create, design, and maintain data types, message structures, mappings, interfaces, integration procedures, and integration scenarios independently of the system landscape.

Navigate to Integration Builder in the SAP PI Tools' Integration Directory. You must establish two channels of communication: one for the sender and one for the receiver. Choose a communication component from the list of available components for the sender and recipient channels. Click Create after entering the name of the communication channel. Choose the options for Communication Channel. Click one of the various adapter kinds by going to Adapter. The adapter type varies depending on the scenario. You can choose file adapter in a file-to-file scenario. The receiver also needs a route of communication, which you must establish. Click Create after entering the communication channel component and the receiver's communication channel name. Choose File as the Adapter Type, then choose Receiver. Choose the communication channel that was established for the Sender under the Inbound Processing

tab. Choose the communication receiver from the Receiver tab. Select Operation Mapping under the Receiver Interfaces tab. To choose the operation mapping, click Search. Select the Receiver Communication channel under the Outbound Processing tab. Collect the WSDL link in integration builder after activating.

D. SAP

One of the world's top software developers for business process management, SAP creates products that help firms share information and process data efficiently. SAP created ABAP as a programming language for creating business applications within the SAP environment. It is possible to programme objects- orientedly thanks to the ABAP Objects component. The ABAP programming interface is used by SAP NetWeaver's Application Server ABAP (AS ABAP). A programme that includes function modules is called a function group. A function group id, a four-character identifier, is used to identify it. When a function module is called in a specific programme, it executes a specific sort of function. A function group, on the other hand, is a collection of function modules of a similar type. With distinct function groupings, a customer, vendor, and employee portal has been developed. There are multiple function modules under each and every function group. Function modules for customer profile, customer enquiry, customer sales order data, customer list of delivery, customer invoice, customer payments and ageing, and customer credit and debit memos have been designed for the customer portal. Customer identifying information, including name, address, phone number, and pin code, is contained in the customer profile. One or more entries in a customer inquiry data set contain the desired amount of a good or service. The information is obtained from the standard BAPI (Business Application Programming Interface).

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They are specific methods for SAP business objects, which are used to perform particular business functions and are kept in the SAP system's Business Object Repository (BOR).

A sales order is a legal document that is issued to a customer by a seller. It confirms the exchange of products or services and specifies the transaction's particulars, such as the volume, cost, and standard of the delivered items or services. Customer Delivery refers to the procedure of registering you on the Company's platform, configuring your partner requirements and product data, and enabling your Services. A bill that is associated with a sale and is provided by an organisation to a customer is known as a customer invoice for a sales order. Based on a sales order, which include order lines and item numbers, this kind of client invoice is produced.

The Customer Aging Report lists all outstanding customer balances, arranged by date range or ageing period. The following default settings are shown when you generate this report. Both a debit memo and a credit memo inform clients of a change in their account status. Customers (or buyers) are informed via a debit memo as to why their account balance has decreased or why they now owe more.

Vendor profile, vendor request for quotation, vendor purchase order data, vendor goods receipt, vendor invoice, vendor payments and ageing, and vendor credit and debit notes are among the function modules that have been developed for the vendor portal. An itemised price quote from a vendor for a particular good or service connected to your application and desired project is known as a vendor quote. A document header and many components make up a purchase order. The data in the header applies to the whole purchase order. The header, for instance, defines the terms of payment and delivery. Each of the document elements has a designated procurement type. In the Warehouse Management System (WMS), a goods receipt refers to the actual transfer of materials or items into the warehouse. It is a type of commodities transportation used to send items obtained from outside suppliers or internal manufacture. Every time a shipment is received, the amount of inventory in the warehouse grows.

Employee profile, leave request, and pay stub function modules have been designed for the employee portal. The employee leave request database is used to process the employee leave requests. Both the absences infotype (2001) and the attendances infotype have the employee times posted (2002). Every month, an employee receives a paper from their employer called a wage slip. From the gross wage to the net take-home pay and deductions, everything is shown. Every month, a wage slip is given out following the delivery of your pay by an employer.

III. PROPOSED WORKFLOW

Following the creation of function groups for three portals in the SAP backend, numerous function modules were then created. The first step is to check it in the soap ui to check the response after collecting the WSDL link in the RFc web service and pi/po. The soap ui will generate the request code after receiving the WSDL link and completing the necessary authentication. After running the request code, which asks for the portal's user ID and password, it will provide the appropriate response in xml format. Change the soap

environment of the answer to the postman environment. Copy and paste the generated url from the soap ui into postman using the post request, and include the headers that were produced by the soap ui.

For the desired response, copy the request code and paste it into Postman. After gathering the response, gather the node.js request code for the following step. Create a desired fm api in node.js, and the customer portal will save the username and password values in an angular ts file. We will use the ts file to consume the api in order to receive the response. By supplying the parameters that were saved in the ts file to the node.js- created api and then providing those parameters to the request code that was retrieved via postman. We can obtain the response in xml format by running the node. We are converting the response from xml to json in order to bind the data in an html file. Data is bound in HTML after tables are created to produce the desired answer on the portal page.

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