

# **Oracle Approvals Management (AME) drives email approvals of Invoice Images**

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## **Introduction**

This document details an integrated and efficient solution that Equinix uses to approve transactions via email that originate in Oracle Payables. An email is delivered with an approval request and the invoice image (stored in the Applications) as an attachment. The solution uses Oracle's Workflow and Approvals Management Engine (AME) capabilities to define approval rules with varying level of approvals. The user directly approves via email by viewing the Invoice image and responding accordingly. The response is updated within Payables for the specific invoice status. Rules configured in AME determine the right approver for Invoice approvals.

This document highlights the defined solution that uses email as the primary interface to approve Payable Invoices. A review of the steps will be discussed to enable the viewing of the Invoice image sent from Oracle for approvals. In addition, learn about the tips and techniques leveraged to configure the solution using AME and Workflow capabilities.

## **Solution Overview**

Equinix implemented an automated process to approve transactions via email that originated in Oracle Payables. An email is delivered to the user with an approval request along with the invoice image stored in the Applications. By leveraging the capability of Oracle's Workflow and AME functions, automated rules are applied to determine the right approver for the invoice for email delivery. Then, the user directly approves via email by viewing the Invoice image and responds. The user does not need to log onto the Oracle Applications and performs the necessary actions via email. The response is sent and updated automatically within Oracle Payables for the specific invoice status.

## **Business Process Improvements Identified**

A business process assessment of the Procure to Pay - Invoice Approval, identified business pain points. The current paper-based process was manually intensive and non-scalable for a growing company.

- The AP department would enter the invoice into Oracle and put it on hold
- The original Invoices documents were mailed to multiple site locations
- Each site lead would disperse the paper invoices to the designated approvers
- The site lead would collect all invoices and mail back to the Accounts Payable department for action
- The AP department would apply action to release the hold on the invoice for payment or take other action

As a result of this manual process Invoices were loss in transit, costs were incurred for physical mailing of invoices and the manual accrual at month-end was not efficient.

## **New Business Requirements for Invoice Approvals**

In order to streamline the Invoice Approval process, an integrated Oracle technology and email solution was defined to leverage the full capabilities of Oracle Payables, Oracle Workflow and AME technologies. The solution was defined to be flexible to support different Invoice types that do not require receipts. The key requirements were:

1. Route invoices for approval after invoice validation and all invoice holds are resolved

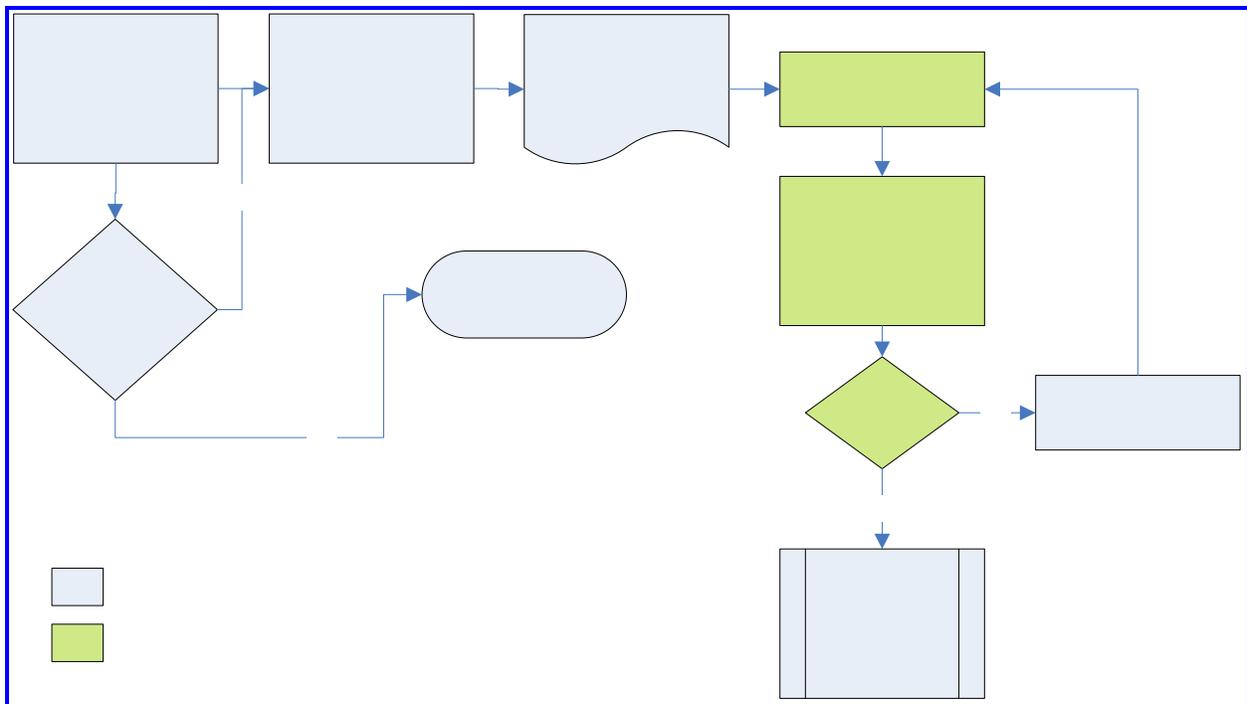
2. Send email to the Approver with the invoice image as an attachment
3. System should determine approvers based on business rules
4. Approver should be able to approve, reject the invoice from email. Logging into Oracle workflow user screens not required
5. Invoice approval not required for 3-way match cases
6. Specific vendors are exempt from invoice approval
7. Specific invoice types (e.g. Expense Reports) are exempt from invoice approval
8. AP Analyst should be able to specify the approver name on the invoice for non PO Match invoices
9. For PO match invoices, system should route to requester on the PO distribution line
10. For Real Estate PO match invoices, a different approval flow is required

Since an invoice can have several distribution lines with varying types, the system will determine the invoice type and approver based on the following criteria:

1. If there are any distribution lines matched to a 3-way match PO, it is considered a 3-way match
2. If there are any distribution lines matched to a 2-way match PO and there are no lines matched to a 3-way match PO, it is considered a 2-way match and should be routed to a PO requester
3. If none of the distribution lines are matched to a PO, it is considered not matched to a PO and an AP Analyst will enter the approver in a descriptive flexfield on the invoice header.
4. The AP Analyst should not be able to enter his/her own name as an approver in the descriptive flexfield on the invoice header.

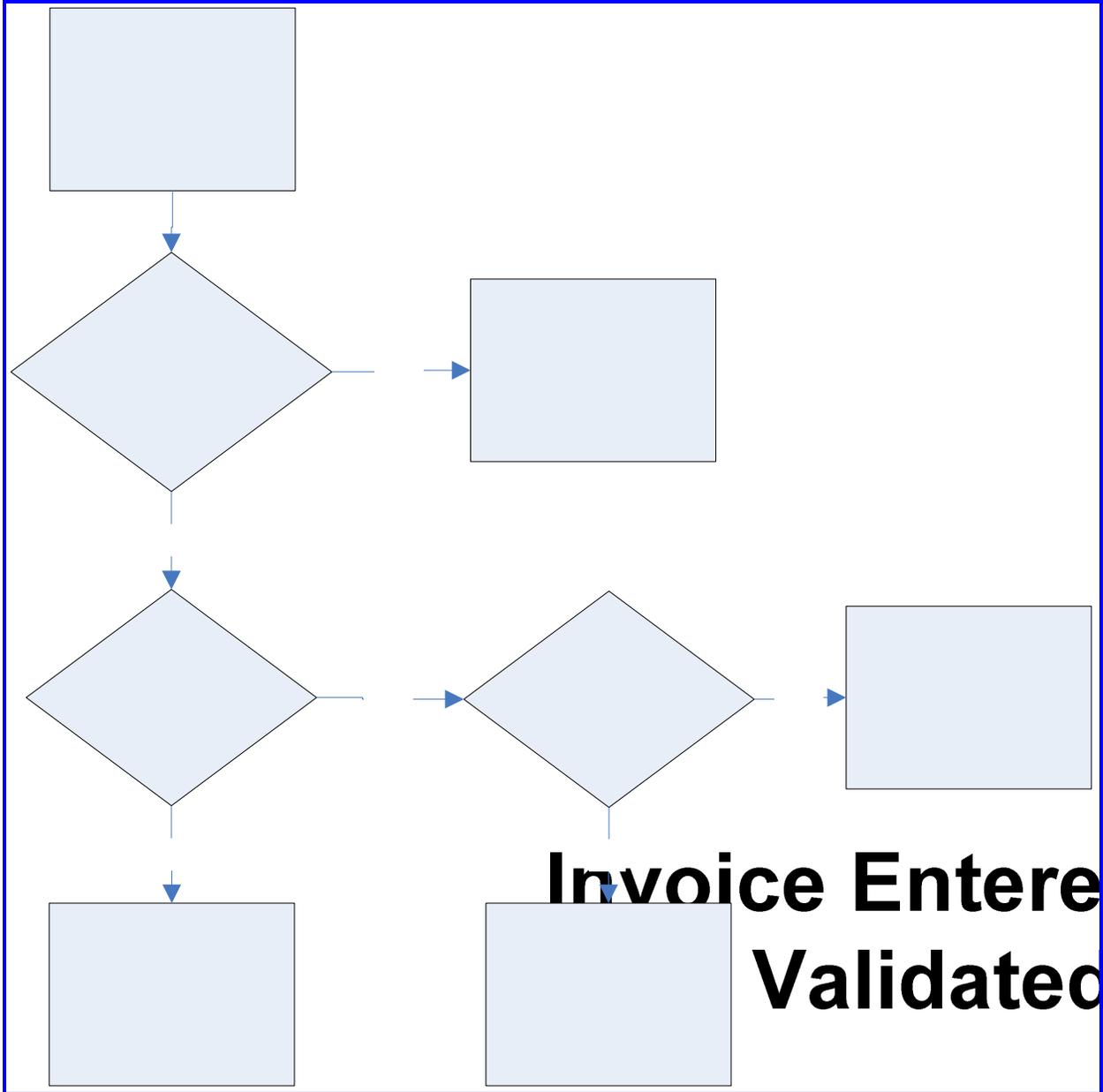
### Business Process Flow

A custom solution leveraging Oracle Workflow and AME is deployed that allows Accounts Payable to attach the scanned image of the paper invoice. On initiating approval for invoices, the system sends an outlook email to approvers which is determined using a set of AME rules. The approvers open the email and send the approval or other actions via email as well.



### Process Flow to determine AME Rules

In preparation to define the Oracle AME rules for approval authorization and routing, the following business flow laid out the business rules for implementation.



## The Steps to Configure the Solution

The following sections provide the setup options to configure the implemented solution for:

- Payables Options enabled
- Workflow Modification
- AME Rules Configuration

## Payable Application Setups

**Step1:** Define a custom profile option for debugging transaction processing errors that might occur in the system. Refer to the SQL validation script in the defined Profile form below.

The screenshot shows the Oracle Profiles configuration window. The profile name is 'EQX AP SET DEBUG WORKFLOW', the application is 'Payables', and the user profile name is 'EQX: APINV Set Debug Workflow ON'. The description is 'Enable/Disable debug mode for AP Invoice approval workflows'. The hierarchy type is 'Security'. The hierarchy type access level table shows that Site, Application, Responsibility, and User are visible and updatable, while Server, Server+Responsibility, and Organization are not. The active dates start on 24-OCT-2007. The user access is set to visible and updatable. The SQL validation script is provided below the table.

Hierarchy Type Access Level	Visible	Updatable
Site	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Application	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Responsibility	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Server	<input type="checkbox"/>	<input type="checkbox"/>
Server+Responsibility	<input type="checkbox"/>	<input type="checkbox"/>
Organization	<input type="checkbox"/>	<input type="checkbox"/>
User	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SQL Validation used for the Profile Option's List of Values

```
SQL="select lookup_code, meaning \"Set debug Workflow ON\"
into :profile_option_value, :visible_option_value
from fnd_lookups
where lookup_type = 'YES_NO'
Column=\"Set debug Workflow ON\""
```

## Step 2: Fix Oracle Bugs and Apply Patches

Clean up duplicate rows in Oracle. This was identified as an Oracle bug which was fixed by following

```
Delete from wf_event_subscriptions where wf_process_name = 'APINV_M' and owner_tag='AP'
```

Ensure the Application of requisite patch sets are installed. Patch4551936 - 11i.AP.O and then patch 5948386, 5985780

**Step 3: Setup Payables options**  
**Responsibility: Payables Manager**  
**Setup->Options->Payables->Invoice Tab**

**Payables Options (EQUINIX - US)**

Accounting M... Trans... Payme... Curre... Supplier Invoice Match... Interest Expen... Payment

**Main**

- Use Invoice Approval Workflow
- Allow Force Approval
- Require Validation Before Approval
- Allow Adjustments to Paid Invoices
- Recalculate Scheduled Payment
- Automatically Create Freight Distribution

Freight Account

Confirm Date as Invoice Number

Allow Online Validation

Allow Document Category Override

**GL Date Basis**

- Invoice Date
- System Date
- Goods Received / Invoice Date (J)
- Goods Received / System Date

**Prepayment**

Payment Terms

Settlement Days

Build Prepayment Accounts when Matching

**Step 4.1: Setup descriptive flexfield for Invoice Type**  
**Responsibility: Payables Manager**  
**Setup->Flexfields->Descriptive->Segments**

**Descriptive Flexfield Segments**

Application  Title

Freeze Flexfield Definition Segment Separator

**Context Field**

Prompt

Value Set

Default Value

Reference Field

Required

Displayed

Synchronize with Reference Field

**Context Field Values**

Code	Name	Description	Enabled
EQX_OM_TROUBLEROUTING	EQX_OM_TROUBLEROUTING	Equinix OM Trouble Routing	<input checked="" type="checkbox"/>
EQX_PRODUCT_HIERARCHY	EQX_PRODUCT_HIERARCHY	Equinix Product Hierarchy	<input checked="" type="checkbox"/>
EQX_QOT_APPROVAL_SETUP	EQX_QOT_APPROVAL_SETUP	AME Approver Setup based on Products	<input checked="" type="checkbox"/>
EQX_SR_NOTIFICATION_SETS	EQX_SR_NOTIFICATION_SETS	Obsolete	<input type="checkbox"/>
INVOICE TYPE	INVOICE TYPE	AP invoice Type	<input checked="" type="checkbox"/>
REQUEST_PROBLEM_CODE	REQUEST_PROBLEM_CODE	SR Problem Code	<input checked="" type="checkbox"/>



**Step 4.2 (continued): Sample output – Validate the descriptive flexfield Setup**

**Responsibility: Payables Manager**  
**Setup->Lookups->Payables->Invoice Type**

The screenshot shows the 'Payables Lookups' window with the following details:

- Type:** INVOICE TYPE
- Meaning:** Invoice Type
- Application:** Payables
- Description:** Invoice types
- Access Level:** System (selected)
- Effective Dates:** Enabled

Code	Meaning	Description	Tag	From	To	Enabled
ADJUSTMEN	Adjustment	Adjustment document				<input checked="" type="checkbox"/>
AWT	Withholding Tax	Withholding Tax Invoi				<input checked="" type="checkbox"/>
CREDIT	Credit Memo	Credit Memo				<input checked="" type="checkbox"/>
DEBIT	Debit Memo	Debit Memo				<input checked="" type="checkbox"/>
EXPENSE RE	Expense Report	Employee Exp				<input checked="" type="checkbox"/>
INTEREST	Interest	Interest invoic				<input checked="" type="checkbox"/>
MIXED	Mixed	Mixed type in				<input checked="" type="checkbox"/>
PO PRICE AD	PO Price Adjustment	PO Price Adju				<input checked="" type="checkbox"/>
PREPAYMEN	Prepayment	Prepayments				<input checked="" type="checkbox"/>
QUICKDEFAU	PO Default	PO Default Standard i				<input checked="" type="checkbox"/>

An 'Approval Required' dialog box is open over the 'EXPENSE RE' row, showing 'No' selected and buttons for OK, Cancel, Clear, and Help.

**Step 5: Setup descriptive flexfield for Vendor sites Exemptions**

**Responsibility: Payables Manager**  
**Setup->Flexfields->Descriptive->Segments**

The screenshot shows the 'Descriptive Flexfield Segments' window with the following configuration:

- Application:** Purchasing
- Title:** Vendor Sites
- Freeze Flexfield Definition
- Segment Separator:** Period (.)

**Context Field:**

- Prompt:** Context
- Value Set:** [Empty]
- Default Value:** [Empty]
- Reference Field:** [Empty]
- Required
- Displayed
- Synchronize with Reference Field

**Context Field Values:**

Code	Name	Description	Enabled
Global Data Elements	Global Data Elements	Global Data Element Context	<input checked="" type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

Buttons: Compile, Segments



**Step 6: Set up Value set for Invoice Approver**

A new value set needs to be defined that does not allow the person entering the invoice to add his/her name to the approver field on the invoice header

**Responsibility: Payables Manager**  
**Setup->Flexfields->Validation->Sets**

Value Sets

Value Set Name: EQX AP US PERSON Usages

Description:

List Type: List of Values Security Type: No Security

**Format Validation**

Format Type: Char Maximum Size: 55 Precision:

Numbers Only (0-9)

Uppercase Only (A-Z)

Right-justify and Zero-fill Numbers (0001)

Min Value: Max Value:

**Value Validation**

Validation Type: Table Edit Information

Validation Table Information

Table Application: **Human Resources**      Table Name: **per\_people\_f ppf, per\_person\_types p**

Allow Parent Values

**Table Columns**

	Name	Type	Size
Value	<b>ppf.full_name</b>	Char	55
Meaning			
ID	<b>ppf.person_id</b>	Number	15

Where/Order By: **WHERE ppf.business\_group\_id +0 =  
:\$PROFILE\$.per\_business\_group\_id  
AND ppf.person\_id not in (select employee\_id from fnd\_user where  
user\_id = :\$PROFILE\$.USER\_ID)  
AND ppt.person\_type\_id = ppf.person\_type\_id +0  
AND ppt.system\_person\_type in ('EMP','EMP\_APL','EX\_EMP','EX\_EMP\_APL')**

Additional Columns:

Test

The where clause is:

```

WHERE ppf.business_group_id +0 =
:$PROFILE$.per_business_group_id
AND ppf.person_id not in (select employee_id from fnd_user where
user_id = :$PROFILE$.USER_ID)
AND ppt.person_type_id = ppf.person_type_id +0
AND ppt.system_person_type in ('EMP','EMP_APL','EX_EMP','EX_EMP_APL')
AND ppf.effective_start_date =
(select max(effective_start_date)
from per_people_f ppf1
where ppf1.person_id = ppf.person_id)
ORDER BY nvl(ppf.order_name, ppf.full_name)

```

**Step 7: Set up descriptive flexfield for invoice approver at Invoice Header**  
**Responsibility: Payables Manager**  
**Setup->Flexfields->Descriptive->Segments**

Descriptive Flexfield Segments

Application **Payables** Title **Invoice**

Freeze Flexfield Definition Segment Separator **Period (.)**

**Context Field**

Prompt **Context**  Required

Value Set  Displayed

Default Value  Synchronize with Reference Field

Reference Field

**Context Field Values**

Code	Name	Description	Enabled
<b>Global Data Elements</b>	<b>Global Data Elements</b>	<b>Global Data Element Context</b>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>
			<input type="checkbox"/>

Compile Segments

Segments Summary (Invoice) - Global Data Elements

Number	Name	Window Prompt	Column	Value Set	Enabled	Displayed
<b>10</b>	<b>Approver Name</b>	<b>Approver Name</b>	<b>ATTRIBUTE1</b>	<b>EQX_AP_US_PERSON</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

Value Set New Open

**Step 8: Setup Value set for Real Estate Approver**  
**Responsibility: Payables Manager**  
**Setup->Flexfields->Validation->Sets**

**Value Sets**

Value Set Name: **EQX\_AP\_INV\_REAL\_ESTATE\_APPR** Usages

Description: **Value Set to Hold Approval Information for Real Estate AP Invoices**

List Type: **List of Values** Security Type: **No Security**

**Format Validation**

Format Type: **Char** Maximum Size: **50** Precision:

Numbers Only (0-9)  
 Uppercase Only (A-Z)  
 Right-justify and Zero-fill Numbers (0001)

Min Value:  Max Value:

**Value Validation**

Validation Type: **Independent** Edit Information

**Descriptive Flexfield Segments**

Application: **Application Object Library** Title: **Flexfield Segment Values**

Freeze Flexfield Definition Segment Separator: **Period (.)**

**Context Field**

Prompt: **Context**  Required  
Value Set:   Displayed  
Default Value:   Synchronize with Reference Field  
Reference Field: **:GLOBALS.FLEX\_VALUE\_SET**

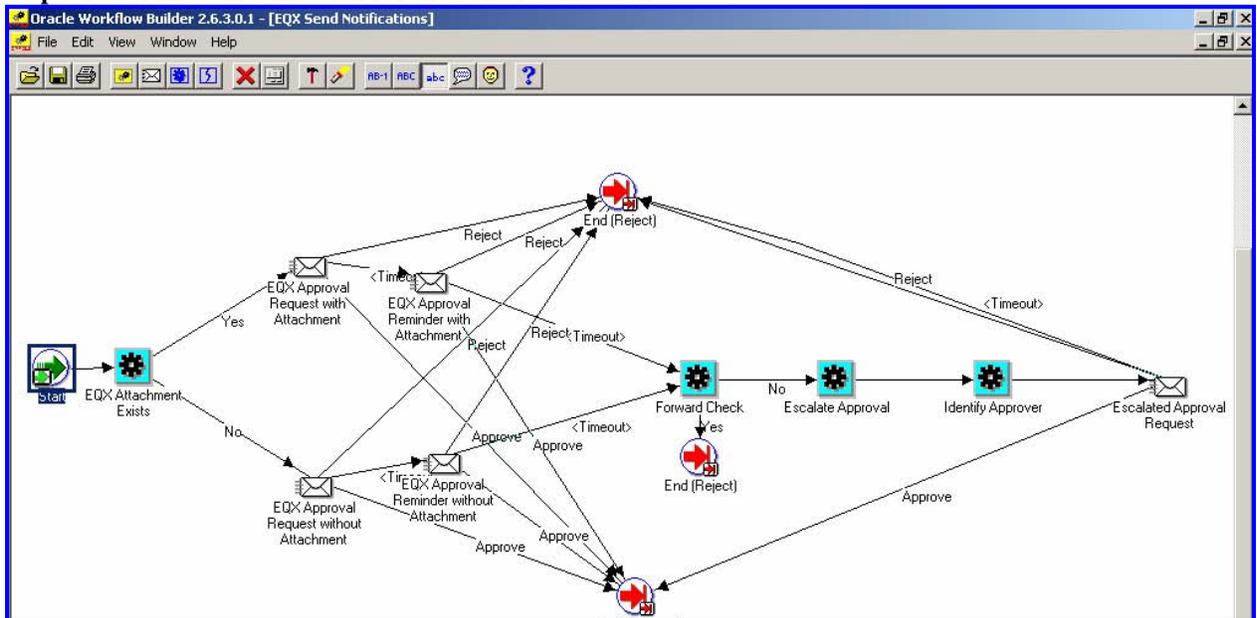
**Context Field Values**

Code	Name	Description	Enabled
Global Data Elements	Global Data Elements	Global Data Element Context	<input checked="" type="checkbox"/>
EQX_AG_SHIPTO	EQX_AG_SHIPTO	Eqx Account generator Ship to site	<input checked="" type="checkbox"/>
EQX_APPROVER_POSITIONS	EQX_APPROVER_POSITIONS	Eqx P2P Approver Positions	<input checked="" type="checkbox"/>
EQX_AP_INV_REAL_ESTATE	EQX_AP_INV_REAL_ESTATE	EQX AP Invoice Real Estate Approver Info	<input checked="" type="checkbox"/>
EQX_CONFERENCE_LOCATIO	EQX_CONFERENCE_LOCATIO	Equinix Conference Locations	<input checked="" type="checkbox"/>
EQX_IBX_DEFAULT_PRINTER	EQX_IBX_DEFAULT_PRINTER	Eqx IBX Default printer for Pick List report	<input checked="" type="checkbox"/>

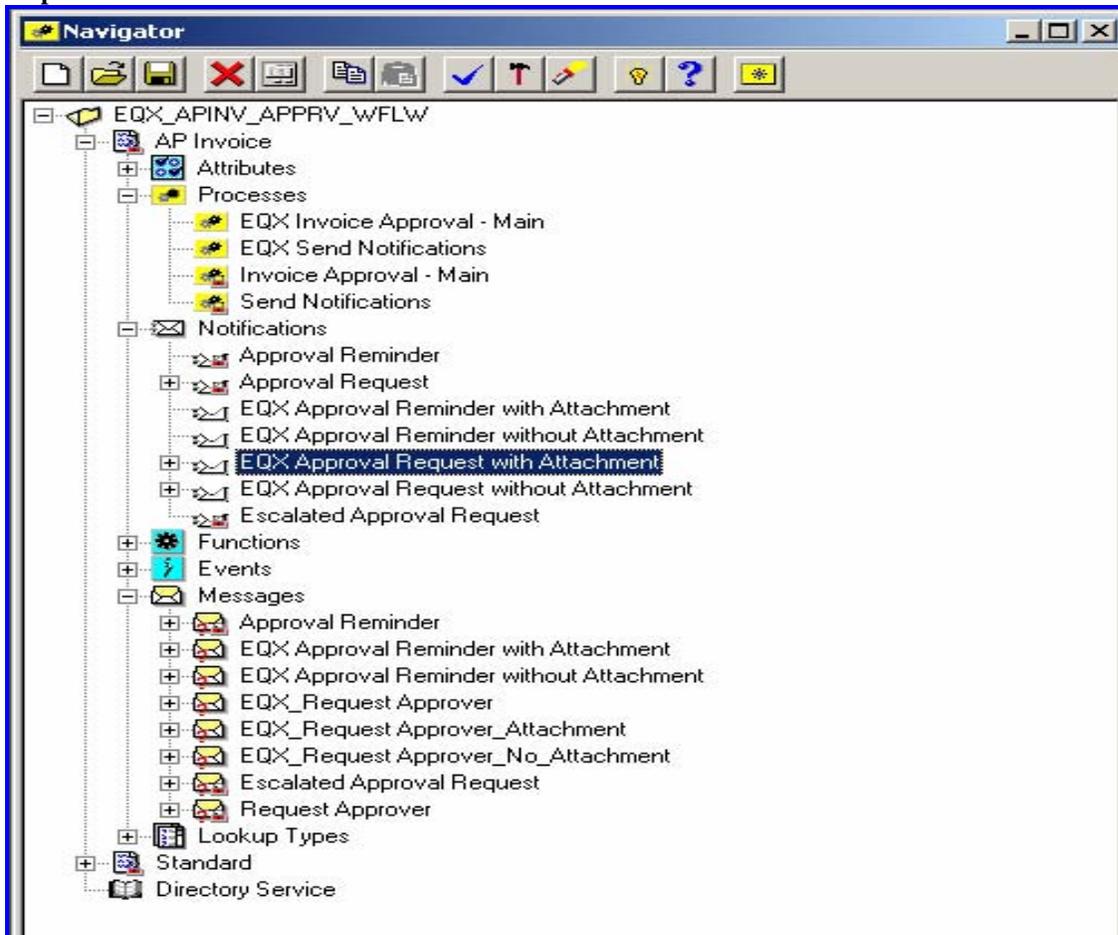
Compile Segments



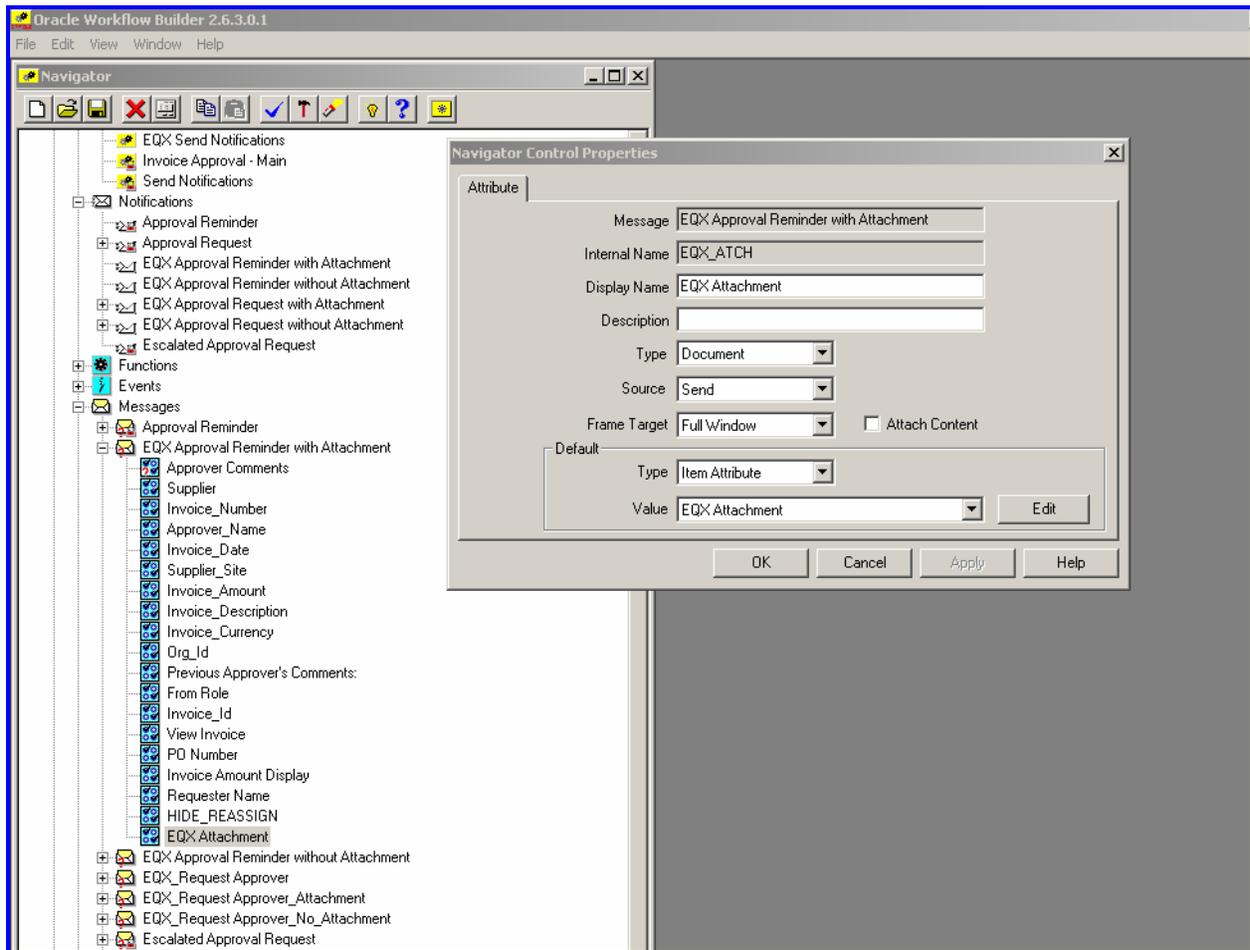
### Step 9.2 Workflow modification for the Send Notification



### Step 9.3 View List of Workflow Modifications



## Step 9.4 Key Feature – Add Attribute of Document Type



The file named EQX\_APIINV\_APPRV\_WFLW.wft has to be loaded for changed workflow definition.

## Step 9.5: Event Subscription

**Responsibility: System Administrator**

**Workflow: Administrator Workflow> Business Events> Subscriptions**

Search with the following values:

- System: "SIPROD.WORLD"
- Event: "oracle.apps.ap.event.invoice.approval"

## Event Subscriptions

An event subscription is a registration indicating that a particular event is significant to a particular system. An event subscription specifies the processing to perform when the triggering event occurs.

### Search

Enter search criteria and select the "Go" button to find your subscription definitions.

System

#### Hide More Search Options

Source Type

Event

Status

### Result: Subscriptions

Select Subscription(s) and ...

Select All | Select None

Select	Event	System	Source Type	Function	Workflow	Status	Update
<input type="checkbox"/>	oracle.apps.ap.event.invoice.approval	SIPROD.WORLD	Local	WF_RULE.DEFAULT_RULE	APINV_M	Disabled	

Create a new subscription with values as shown below.

## Update Event Subscriptions

An event subscription is a registration indicating that a particular event is significant to a particular system. An event subscription specifies the processing to perform when the triggering event occurs.

\* Indicates required field

### Subscriber

\* System

### Triggering Event

\* Source Type

\* Event Filter

Source Agent

### Execution Condition

\* Phase

Subscription with a phase 1- 99 are run synchronously , 100 and above are deferred.

\* Status

\* Rule Data

### Action Type

\* Action Type

The Action Type controls the behavior of the subscription

On Error

### Create Event Subscription - Launch Workflow

Cancel Back Apply

An event subscription can be routed to a Workflow process. Please specify the Workflow Type and Workflow Process to be launched.

\* Indicates required field

#### Action

\* Workflow Type  

\* Workflow Process  

Choose a Workflow Type, before choosing the Workflow Process for that Type

\* Priority

Additional Options

#### Subscription Parameters

Select Name	Value
No results found.	
<a href="#">Add Another Row</a>	

Enter parameters and their values with no spaces

#### Documentation

\* Owner Name

\* Owner Tag

Customization Level

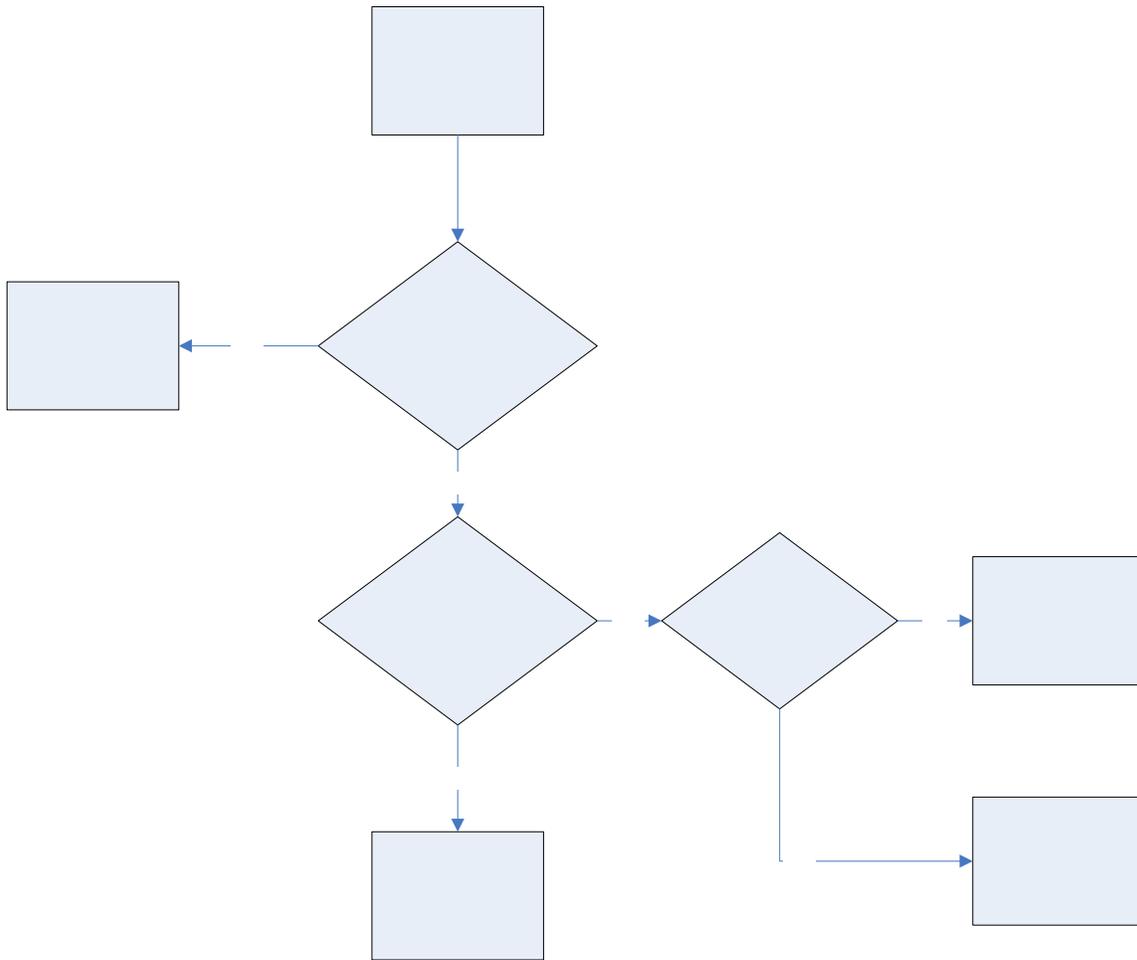
Description

Cancel Back Apply

Click on Apply and open the seeded subscription and set the status as Disabled. Stop and Start the Deferred Listener for the custom workflow to be recognized

## AME Rules Configuration Definition

To define the Oracle AME rules for approval authorization and routing, the following rules are applied.



## AME Rules Configuration and Setups

The option to enable a “Pre-Approver” is implemented using pipelined functions. This requires the following changes:

- Leverage the descriptive flex on HR Table holding the People information
- Create a data structure to create a list object
- Create a package procedure to generate the list of approvers

### Additional Steps for AME Configuration include:

1. Create Attributes
2. Create Conditions
3. Create Approver Group
4. Create Rules

Approval not  
required

Yes

**Step 1: Create Attributes:**

New attributes with dynamic usage type is created with SQL queries as below.

Navigation: AME Application Administrator -> Approvals -> Payables Invoice Approval -> Attributes

Item Class	Name	Attribute Type	Description	Static Usage	Usage
Header Item	IS_APINVOICE_PO_MATCH	Number	Is AP Invoice matched to a PO	No	select EQX_AP_AME_PKG.eqx_is_po_match(:transactionId) from dual
Header Item	IS_APINVOICE_REAL_ESTATE_PO	Number	Is AP Invoice matched to a Real Estate PO	No	select EQX_AP_AME_PKG.eqx_is_real_estate_po(:transactionId) from dual

**Step 2: Create Conditions:**

Navigation: AME Application Administrator -> Approvals -> Payables Invoice Approval -> Conditions.

Condition Type	Item Class	Condition attribute	Lower Limit	Upper Limit	Lower Limit   Include	Upper Limit   Include
Ordinary	Header	IS_APINVOICE_PO_MATCH		0	N	Y
Ordinary	Header	IS_APINVOICE_PO_MATCH	1		Y	N
Ordinary	Header	IS_APINVOICE_REAL_ESTATE_PO		0	N	Y
Ordinary	Header	IS_APINVOICE_REAL_ESTATE_PO	1		Y	N

**Step 3: Create Approver Group:**

Navigation: AME Application Administrator -> Approvals -> Payables Invoice Approval -> Groups

Name	Description	Order Number	Voting Regime	Active List	Query
EQX_APINV_INV_HDR_GROUP	EQX_APINV_INV_HDR_GROUP	Unique, 25	Serial	Dynamic	SELECT column_value from table (cast(EQX_AP_AME_PKG.GET_INV_HDR_APPROVER(:transactionId) as eqx_apinv_aprvrs_list))
EQX_APINV_REQUESTER_MGR_GROUP	EQX_APINV_REQUESTER_MGR_GROUP	Unique, 26	Serial	Dynamic	SELECT column_value from table (cast(EQX_AP_AME_PKG.GET_REQUESTER(:transactionId) as eqx_apinv_aprvrs_list))
EQX_APINV_REAL_ESTATE_GROUP	EQX_APINV_REAL_ESTATE_GROUP	Unique, 27	Serial	Dynamic	SELECT column_value from table (cast(EQX_AP_AME_PKG.GET_REAL_ESTATE_APPROVER as eqx_apinv_aprvrs_list))

**Step 4: Create Rules:**

Navigation: AME Application Administrator -> Approvals -> Payables Invoice Approval -> Rules

Sr #	Header List-Creation Rule
1.	EQX_APINV_GET_INV_HDR_APPRVR Rule Key: EQX_APINV_GET_INV_HDR_APPRVR Conditions: 1. IS_APINVOICE_PO_MATCH <= 0 Actions: 1. approval-group chain of authority: Require approval from EQX_APINV_INV_HDR_GROUP
2.	EQX_APINV_GET_REQUESTER Rule Key: EQX_APINV_GET_REQUESTER Conditions: 1. 1 <= IS_APINVOICE_PO_MATCH 2. IS_APINVOICE_REAL_ESTATE_PO <= 0 Actions: 1. approval-group chain of authority: Require approval from EQX_APINV_REQUESTER_GROUP
3.	EQX_APINV_GET_REAL_ESTATE_APPROVER Rule Key: EQX_APINV_GET_REAL_ESTATE_APPROVER Conditions: 1. 1 <= IS_APINVOICE_PO_MATCH 2. 1 <= IS_APINVOICE_REAL_ESTATE_PO Actions: 1. approval-group chain of authority: Require approval from EQX_APINV_REAL_ESTATE_GROUP

**Conclusion – Results of Business Benefits Attained**

The custom solution deployed for Equinix using the AME rules along with workflow modification for Payables Invoice approval has provided improved flexibility to the business users in the organization. The configured workflow sends outlook email notifications to the managers and approvers with attachments and prompts them to take appropriate action. This has enabled Equinix to create and respond to Invoice approval requests without any delays. Additional process improvements offered by the solution include:

**Saves Time**

- Streamlines the business process with automated invoice routing
- Saves time by reducing manual steps to obtain timely approvals
- Provides an automated flexible solution for the business users
- Enables the capability to automate month-end accruals

**Reduces Costs**

- Prevent loss of invoices in transit
- Reduces Invoice mailing costs

**Improves Accuracy**

- Eliminates manual spreadsheet to track routed invoice approvals
- Enables an audit trail available in the system for business review
- Sends outlook email notification to the managers and approvers with attachment and prompts them to take action