

How-to guide

# LOAN UNDERWRITING AGENT

A practical guide for developers looking to build and use an AI-powered loan underwriting assistant.

*In collaboration with*



# Loan Underwriting Agent – How-to guide

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# Loan Underwriting Agent – How-to guide

## OVERCOMING TRADITIONAL Loan Underwriting OPERATIONS CHALLENGES

In a traditional loan underwriting environment, underwriters often face challenges that reduce productivity and delay loan approvals. These issues lead to increased processing times, missed opportunities, borrower dissatisfaction, and higher operational costs for financial institutions.

Loan decisions frequently rely on manual credit assessments, exhaustive documentation reviews, and complex risk evaluations, all of which are time-consuming. Underwriting involves numerous sequential steps, and any attempt to expedite these tasks often increases the risk of errors, negatively impacting decision accuracy and customer trust.

Variations in experience between seasoned and novice underwriters add further complexity. While some parts of the underwriting process are routine and could be automated, limited use of technology and restricted access to critical financial data impede overall efficiency.

Ultimately, challenges in accessing and analyzing the right information in a timely manner reduce the effectiveness of the underwriting team, underscoring the need for advanced solutions, such as AI-powered credit scoring and risk analysis, to streamline the process and improve customer satisfaction.

## INTRODUCING THE Loan Underwriting AGENT

The Loan Underwriting Assistant is an AI-powered tool designed to automate and optimize various underwriting tasks, such as document verification, credit scoring, and risk analysis.

This guide serves as a practical resource for developers, providing a structured approach to building a robust loan underwriting assistant using AI-powered automation using Automation Anywhere enterprise platform.

The assistant leverages AI and automation to improve efficiency, accuracy, and scalability by processing routine tasks, making data-driven decisions, and offering valuable insights through financial data analysis. By seamlessly integrating with existing loan management and CRM systems, the assistant ensures smooth data flow and improved underwriting performance.

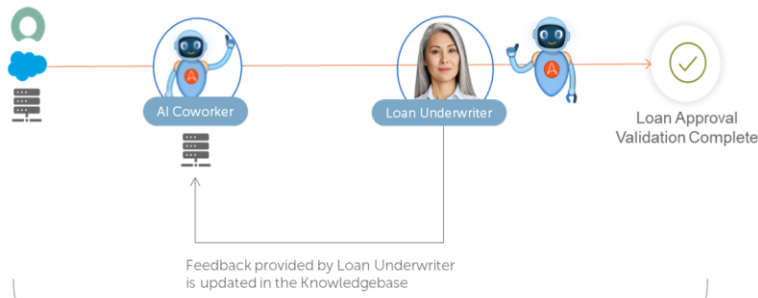
Key benefits include faster loan processing, enhanced decision accuracy, reduced operational costs, scalability, and proactive risk management, making it a transformative tool in modern loan underwriting.

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## Intelligent Loan Approval Agent

1. Analyze and understand loan applications
2. Evaluate creditworthiness and provide recommendations based on organization knowledgebase
3. Leverage AI + Automation to accelerate Loan Approval.

The Loan Officer is presented a 360-degree view of the loan application, including detailed financial data, credit score, a recommended loan amount, suggested terms/interest rate, and estimated monthly payment, all aligned with company guidelines.



Automation & Speed

**5X** increase in agent productivity and 90% reduction in AHT

Compliance & Savings

**6X** return on automation and increased compliance

### AI Coworker Skills

- Analyze and understand loan applications.
- Prioritize and route applications based on risk and urgency.
- Extract key financial data from submitted documents.
- Assess creditworthiness and generate recommendations.
- Compose and send personalized approval or rejection notices.
- Update all relevant systems with application and decision data.

## SOLUTION OVERVIEW

The Loan Underwriting Assistant transforms the loan underwriting process by efficiently automating tasks such as document verification, credit scoring, and fraud detection, allowing underwriting teams to focus on more complex decision-making tasks. This results in faster loan approvals and improved employee satisfaction, benefiting both lenders and borrowers.

### Comprehensive Application

This AI-powered assistant is highly adaptable and can be applied to various stages of loan underwriting, including risk assessment, financial document analysis, credit scoring, and loan decision-making. It integrates seamlessly with loan origination systems, credit bureaus, and other financial platforms to streamline operations.

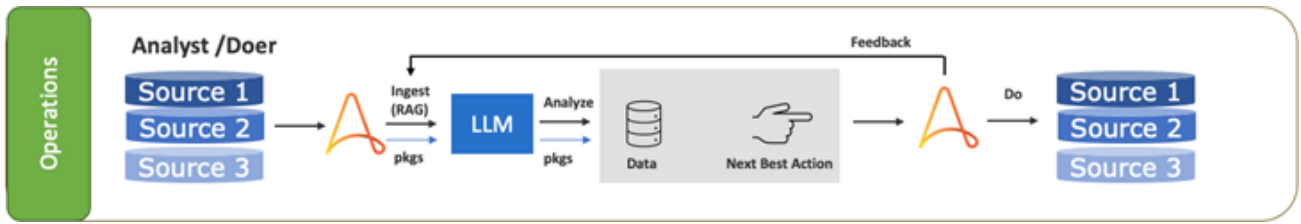
### Integrated and Adaptive Solution

Combining your loan management system with the capabilities of Automation Anywhere and a generative AI provider of your choice creates a responsive, efficient, and adaptive underwriting solution. This setup addresses underwriting challenges and enhances employee productivity by integrating AI-powered assistance directly into the underwriting workflow. The assistant automates routine tasks, quickly retrieves relevant financial data, and provides notifications and alerts to keep the process on track.

### Leveraging Generative AI

By utilizing generative AI (GenAI) from hyperscale frameworks or enterprise-grade AI platforms, the underwriting assistant can deliver intelligent insights, personalized recommendations, and automated workflows. This enables underwriters to focus on core responsibilities, like complex risk evaluations, while automating repetitive tasks. As a result, employees can dedicate more time to strategic decision-making, improving overall productivity and enhancing the borrower's experience.

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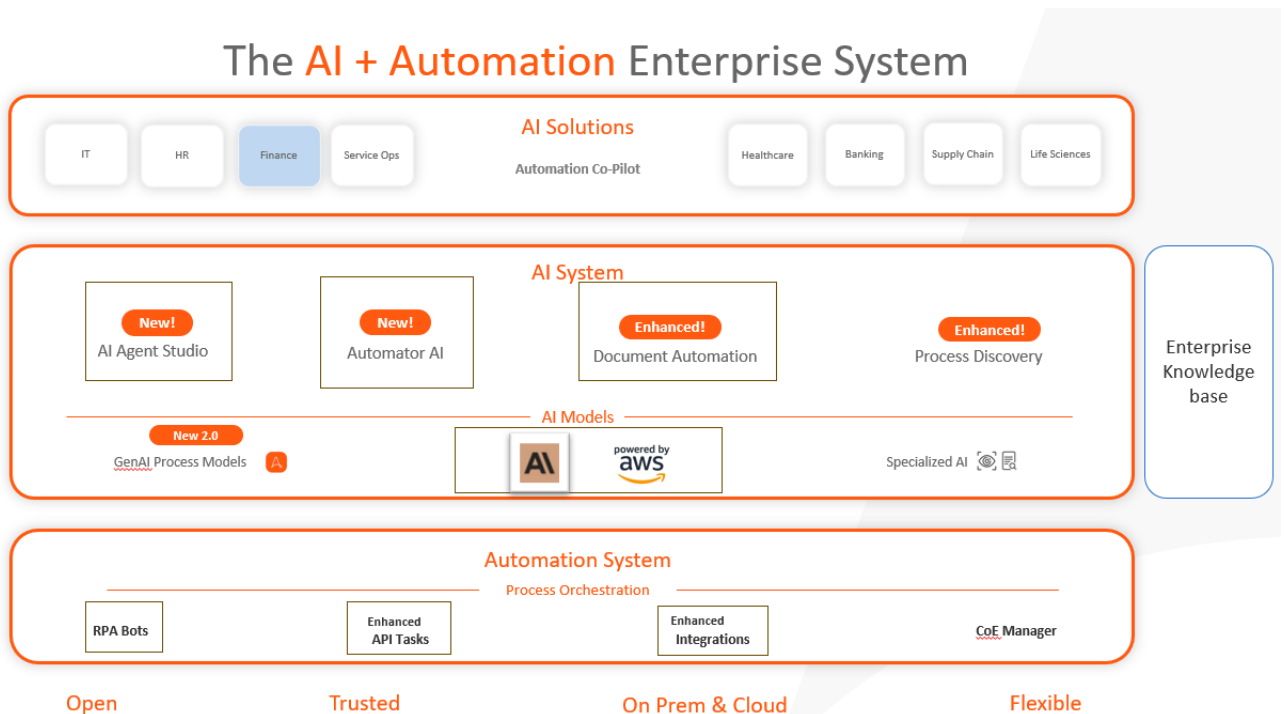


## Key features of the Loan Underwriting Agent

- Extracts applicant details from income and other financial documents
- Auto-calculates loan parameters, helping underwriters quickly assess loan eligibility.
- Refers to policy documents from the AI-powered Knowledge Base for recommendations.
- Suggests loan terms and related parameters.

## THE Loan Underwriting Agent COMPONENTS

### Overall Architecture










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## Customizing your Loan Underwriting Agent

The Loan Underwriting Agent’s working knowledge is made of data and leverages retrieval augmented generation (RAG) for fast indexing and knowledge retrieval. By leveraging AWS Bedrock Service, we can build robust knowledge activities in our AI Agent which can expand to complex analysis, decisioning and suggestion. This data can be manuals, loan guidelines, websites, standard procedures, policy documents and much more. We have made it very easy to customize the Loan Underwriting Agent to your business needs using your GenAI provider of choice.

- AWS Knowledge Retrieval & Conversation Package ([Link to BotStore](#))

| Selected package details   |  |
|----------------------------|--|
| Name<br>GenAIRAGAWSPackage | Description<br>Generative AI Retrieval Augmentation Package.   |
| Vendor<br>Unspecified      | Recommended bot agent version<br>21.250 or above   |
| Actions                    | Actions (7)  |
|                            | >  Ask Questions                      |
|                            | >  Chat with your document            |
|                            | >  Create new knowledge base          |
|                            | >  Create S3 Bucket                   |
|                            | >  Get Sync Status for Knowledge Base |
|                            | >  Sync knowledge base              |
|                            | >  Upload file(s) to S3 Bucket      |

*For more complex scenarios, use the AWS Bedrock Console.*

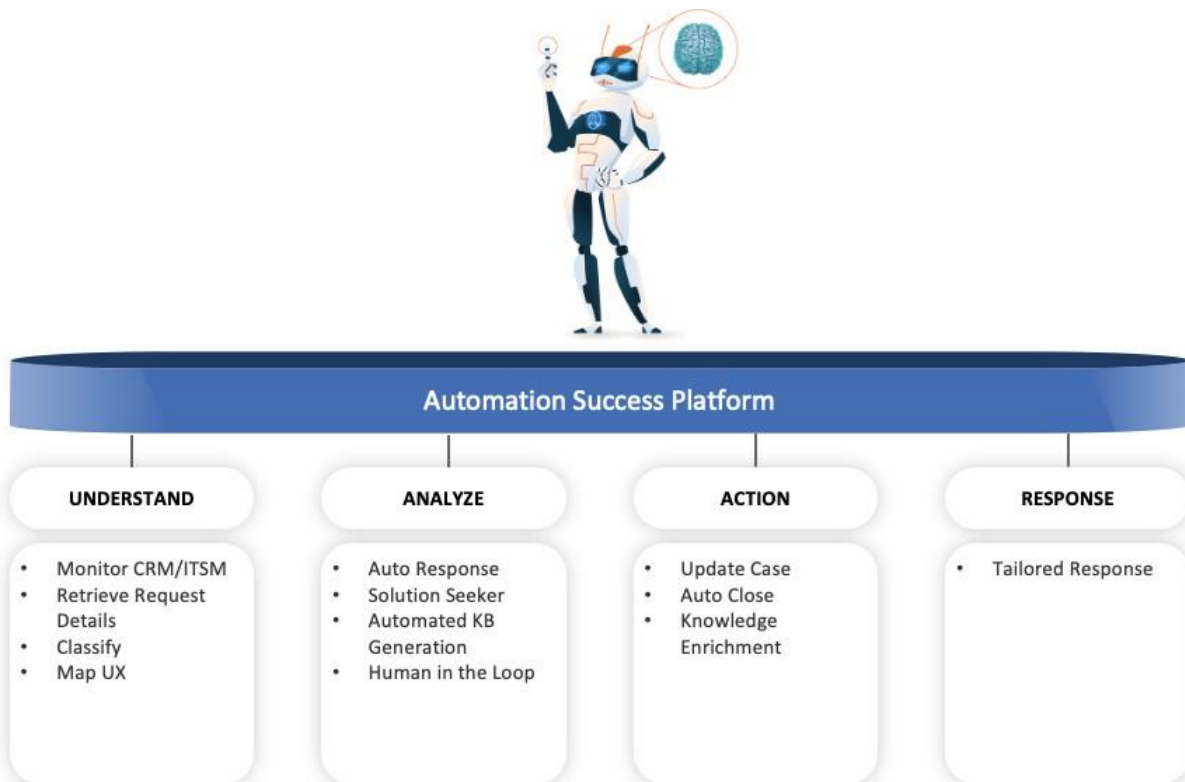
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## Connecting the Loan Underwriting Agent knowledge to an automation

Automation retrieves data and working knowledge to provide actionable recommendations. System and user prompts are used together to ask questions and receive answers, leveraging knowledge from the Loan Underwriting Agent with the language and reasoning from the LLM. System prompts include dynamic data from the request and persona definitions for what needs to be done. Automation serves as the vehicle for the AI to pass user data, case information, and system metrics to the LLM, enabling fully automated dynamic decision making and case resolution.

- **Extract Data**
  - Extracts user and other documents data is surfaced through automation, which extracts the data and passes it to the next action in the workflow.
- The Loan Underwriting Agent identifies automated and suggested action(s)
  - Automation-based actions with the Loan system.
  - Automation within the Automation Success Platform.
  - Automation-based actions with other systems.
- The Loan Underwriting Agent identifies response needs
  - Automation-based communications
  - Loan system API interaction
  - Loan Underwriter UX interaction

## MAIN FEATURES



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## Understand

- Monitor the communication channels like Emails, Outlook.
- Retrieve request details.
- Calculate the various loan and income parameters.
- Leverage GenAI tools and Automation Co-Pilot user interfaces.

## Analyze

- Auto Response
  - Identify loan parameters, requestor income.
  - Recommend
  - Ask additional questions
- Solution Seeker
  - Beyond Basic Automation: This solution surpasses traditional automation by enhancing the loan underwriting process. It provides clarity for applicants and delivers detailed, actionable steps for underwriters, significantly reducing processing time and optimizing resource utilization. Additionally, it ensures thorough follow-up with both the applicant and the underwriting team, improving communication and decision-making.
  - Knowledge Integration: The assistant matches each loan application with relevant policy documents and historical loan decisions from the AI-powered Knowledge Base. This allows for informed decision-making based on established procedures and prior resolutions.
  - Proposes Loan Decisions and Next Steps: The assistant not only suggests whether the loan should be approved or denied, but also recommends the next steps for underwriters, such as further document review or risk mitigation strategies, streamlining the process for quicker and more accurate outcomes.
- Automated KB Article Assistant
  - Utilize GenAI to generate summaries and documentation: AI is used to create comprehensive notes, summaries, and decision-making steps, compiling the information into a PDF or DOCX format for inclusion in the underwriting Knowledge Base. This allows for easy reference and consistency in future underwriting processes.
- Human-in-the-loop
  - After the recommendation is generated by GenAI, it can be further verified by the Loan underwriter or approver via UI form.

## Action

### Automation

- Update Loan system using APIs / interface.
- Automated Knowledge Enrichment
  - Leverages the Automated KB Article Assistant to continuously improve the Knowledge Store.
  - This enrichment is an automated process that enhances historical relevance with a knowledge base (KB). Enables the ingestion of prior existing and day forward historical documents and generates concise case summaries, which are then added to the KB. By continuously learning from these summaries, the system improves its understanding and relevance over time. This gives better answers which are tied to known good data and reduces hallucinations that happen with LLMs alone. This is your data, under your control, and is grounded



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to your practices.

## Augmented Human-in-the-loop

- Augment Loan Underwriter (SME)
- Human integrated
- Confirms suggested steps
- Completes message to requester
- Oversight and escalation handling.
- Escalation overview
- Assess best path forward
  - Choose from automations
  - Work the request
- Loan underwriting review
- Expert resolution detail and summary including actions taken are captured for historical detail and continuous improvement enhancing organizational knowledge that is available for further automation and augmentation of service SMEs raising the intelligence and proficiency of all SMEs.
- Review outbound requester communications.

## Optional

- Request Intake
  - Automation:
    - Multichannel (email, phone, chat, scanned document)
    - Leverage Document Automation
    - Integrate with service operations platform.
    - Scheduled as needed or triggered.
  - Service Requester:
    - Service SME Analyst chooses automation.
    - System Generated
    - Auto-invoked with process triggers
- Auto Assignment
  - Assign OPEN & UNASSIGNED requests to coverage paths.
    - Time zones
    - Regions
    - Specialists
    - Support agreements and SLAs
  - Keyword-based or GenAI
  - Scheduled (i.e. every 10 minutes)
- Escalation Determination
  - Priority
  - Specialty

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## Response

- Auto Response
  - Closed Loop Communication.
  - Status conveyance.
    - Feeds request in Service Operations Platform.
    - Requester notification.
  - Loan application acknowledgement and status sent to loan requestor.
- Response to Requester
  - Human amended further tailoring of details to the loan details.
  - Loan application in process
    - Application Initiated
    - Need more information.
  - Loan summary
- Update Application details in Loan system

## Optional

- Escalation Handling
  - Matter of the Loan Request detail
  - Loan system platform escalation still applies.

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## USING THE CODE



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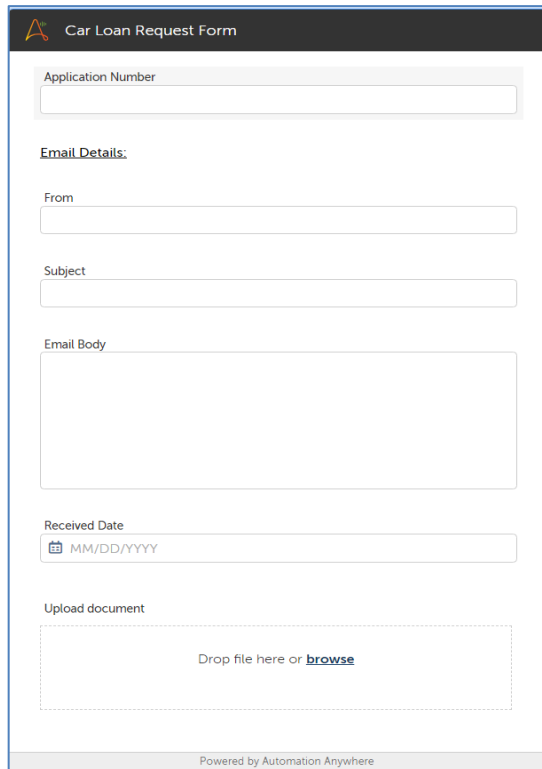
## WALKTHROUGH

Here is a high-level flow of the Loan Underwriting Agent solution:

1. Firstly, the salesperson from the auto dealership collects the information of Loan requestor and sends an email to Bank's loan department including the information like Purchase price, taxes, down payment, purchaser income details etc. In the email attachment, the dealer needs to upload purchaser's W2 Form (income statement).
2. In the second step, Email contents are read, and attachment (W2 form) is sent to Document Automation (DA) to extract the required fields of purchaser like, Name, Address and Annual income.
3. The bot also extracts the required fields from email content using Email extractor (GenAI) agent as mentioned above.
4. Now, with the extracted data, the required values like Requested Loan amount and purchaser's income details are sent to Loan Recommendation AI Agent. This AU agent analyzes the loan details against the loan guidelines and policy documents that are already been stored to RAG system and suggest the loan recommendations accordingly.
5. If the Loan Underwriting Agent suggests that the loan should be approved by highlighting the risk and loan terms, it involves a human-in-loop by presenting a final review form before taking any action. When the loan underwriter submits the form, it initiates the next action.
6. As an Action, it triggers updating the Bank's loan system and sends out the business communication email to the respective stakeholders.
7. On the other hand, if the AI agent thinks that the loan should get rejected due to not complying with the Bank's policy or violating any conditions, it triggers the same action, but with loan denial values.

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## 1. Read Emails



The screenshot shows a web form titled "Car Loan Request Form" with the Automation Anywhere logo. The form contains several input fields: "Application Number" (a single-line text box), "Email Details:" (a section header), "From" (a single-line text box), "Subject" (a single-line text box), "Email Body" (a large multi-line text area), "Received Date" (a date picker showing "MM/DD/YYYY"), and "Upload document" (a dashed box containing the text "Drop file here or [browse](#)"). At the bottom, it says "Powered by Automation Anywhere".

The **Loan Request Form** below interacts with the loan requestor to retrieve email content and attachments. If connected, the bot can directly read emails from the outlook or SMTP or IMAP servers. The requestor can also upload the supporting documents required for loan application.

The Email content is stored in EmailContent String variable and used to define various loan parameters across the solution.

Users can upload supporting documents like Salary slip, W2 document or other income proof here, which is used to define requestor's loan parameters.

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## 2. Data Extraction from Loan documents

|    |  |
|----|--|
| 36 | △ Error handler: Try   |
| 37 | 📄 Comment "*****Automation Logic Goes Inside Here*****"  |
| 38 | 📄 Comment "Upload User Input File and Extract Document Data"   |
| 39 | 📄 Document Extraction: Extract data Upload files to a custom engine for extraction                               |
| 40 | 📄 Document Extraction: Get document data Retrieve document data in user-friendly formats like Dictionary or JSON |
| 41 | ◇ If string \$extractedData{Status}\$ Equals to(=) "DW_GET_DOCUMENT_SUCCESS"                                     |
| 42 | 🗨 String: Assign \$extractedData(DocumentJson)\$ to \$documentJsonString\$                                       |
| 43 | 📄 Json: Start session Start JSON session using Text in session "Default"   |
| 44 | 📄 Json: Get node value from the JSON path "\$\$.fields.[First Name].value" in the session "Default"              |
| 45 | 📄 Json: Get node value from the JSON path "\$\$.fields.[Last Name].value" in the session "Default"               |
| 46 | 📄 Json: Get node value from the JSON path "\$\$.fields.Address.value" in the session "Default"                   |
| 47 | 📄 Json: Get node value from the JSON path "\$\$.fields.City.value" in the session "Default"                      |
| 48 | 📄 Json: Get node value from the JSON path "\$\$.fields.State.value" in the session "Default"                     |
| 49 | 📄 Json: Get node value from the JSON path "\$\$.fields.[Zip Code].value" in the session "Default"                |
| 50 | 📄 Json: Get node value from the JSON path "\$\$.fields.Wages.value" in the session "Default"                     |
| 51 | 📄 Json: End session End JSON session "Default"   |
| 52 | 📅 Datetime: To string Convert \$\$System:Date\$ and assign result to \$strDate\$                                 |
| 53 | 📅 Datetime: Assign \$\$System:Date\$ to \$Date\$   |
| 54 | △ Error handler: Catch AllErrors   |

This “Extract Document Data” Task Bot is used to extract various fields related to loan applications from the requestor provided document(s). The extracted fields are assigned to local variables to be used in subsequent process steps.

## 3. Extract Email Content

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△ Error handler: Try

💬 Comment "\*\*\*\*\*Automation Logic Goes Inside Here\*\*\*\*\*"

▼ 

□ Step "Process incoming email through GenAI"

📧 Message box "Email Message: \$inMessage\$"

🔗 Generative AI Prompt Template: Execute The prompt to be executed will be rendered on Prompt Template selection in the Automation.

🗨 String: Replace "Here is the JSON object with the requested information extracte..." with in \$ai\_response\$ and assign the result to \$ai\_res...

🗨 String: Replace "```json" with in \$ai\_response\$ and assign the result to \$ai\_response\$

🗨 String: Replace "```" with in \$ai\_response\$ and assign the result to \$ai\_response\$

📧 Message box \$ai\_response\$

▼ 

□ Step "AI Response JSON needs to be parsed"

📄 Json: Start session Start JSON session using Text in session "Default"

📄 Json: Get node value from the JSON path "Vehicle" in the session "Default"

📄 Json: Get node value from the JSON path "MSRP" in the session "Default"

📄 Json: Get node value from the JSON path "[Freight, Taxes and Fees]" in the session "Default"

📄 Json: Get node value from the JSON path "[EV Rebates]" in the session "Default"

📄 Json: Get node value from the JSON path "[Trade-in Value]" in the session "Default"

📄 Json: Get node value from the JSON path "[Down Payment]" in the session "Default"

📄 Json: Get node value from the JSON path "[Total Purchase Price]" in the session "Default"

📄 Json: Get node value from the JSON path "[Car Salesman]" in the session "Default"

📄 Json: Get node value from the JSON path "Dealership" in the session "Default"

📄 Json: End session End JSON session "Default"


▼ 

△ Error handler: Catch AllErrors

This “Extract Email Content” Task Bot is used to extract various fields related to loan applications from the email sent by the dealer or salesperson. An AI Skill “Email Data Extraction” is created using Prompt Template in AI Studio. This skill (prompt template) is used to query LLM to calculate “Total Purchase Price” and extract/formulate other loan fields. The extracted fields are assigned to local variables to be used in subsequent process steps.

LLM (Model): anthropic.claude-v2:1

Vendor: Amazon Bedrock

 AUTOMATION  
ANYWHERE

14

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## AI Skill - Email Data Extraction

Model connection

Anthropic-claude2.1

Model: anthropic.claude-v2:1

Vendor: Amazon Bedrock

Description:

Max Tokens ⓘ

2048

Temperature ⓘ

0.5

Top K ⓘ

5

Top P ⓘ

0.7

Prompt

🔗 You are a math and JSON expert and one that specializes in vehicle purchasing at a dealership.

Rules:

1. Given the details in the email below, extract the following information and put them into a JSON object.
2. Also calculate the Total Purchase Price using the following formula:

$(\text{MSRP} + \text{Freight, Taxes and Fees}) - \text{EV Rebates} - \text{Trade-in Value} - \text{Down Payment} = \text{Total Purchase Price}$

3. Strictly do not input any other text or content in the response you provide, apart from the JSON in the below format:

{

"Vehicle":

"MSRP":

"Freight, Taxes and Fees":

"EV Rebates":

"Trade-in Value":

"Down Payment":

"Total Purchase Price":

"Car Salesman":

"Dealership":

}

4. Here's a working example that you should look to as you evaluate the parsed data for your own calculations:

\$\$50,000 MSRP +  
\$\$5,000 Freight, Taxes and Fees -  
\$\$5000 EV Rebates -  
\$\$5000 Trade-in Value -  
\$\$10,000 Down Payment =  
\$\$35,000 Total Purchase Price

Here is the Email content to be processed:

\$inMessage\$



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## 4. Generate AI Recommendation

The screenshot displays the configuration for a task bot named "Step 'Utilize Agent with RAG to determine loan approval'". The configuration is organized into a sequence of steps, each with a specific icon and a description. The steps are as follows:

- Comment "Perform Credit Analysis"**: A green speech bubble icon.
- AAI Enterprise Knowledge: Ask Question**: A document icon with a question mark. The description is "Get response for 'You are an expert in retail loan credit analysis. I...'".
- Message box plus: Show dictionary \$response\$**: A message box icon with a plus sign.
- String: Assign \$response{output}\$ to \$ai\_response\$**: A double quote icon.
- Json: Start session**: A document icon. The description is "Start JSON session using Text in session 'Default'".
- Json: Get node value**: A document icon. The description is "from the JSON path 'status' in the session 'Default'".
- Json: Get node value**: A document icon. The description is "from the JSON path 'risk' in the session 'Default'".
- Json: Get node list**: A document icon. The description is "from JSON path 'terms' in session 'Default'".
- Json: End session**: A document icon. The description is "End JSON session 'Default'".
- If string \$status\$ Equals to(=) 'denied'**: A yellow diamond icon.
- Message box "Denied!!!"**: A message box icon.
- String: Assign "Deny" to \$Recommendation\$**: A double quote icon.
- Json: Get node value**: A document icon. The description is "from the JSON path '[denial reason]' in the session 'Default'".
- If: Else**: A yellow diamond icon.
- Message box "Accepted!"**: A message box icon.
- String: Assign "Accept" to \$Recommendation\$**: A double quote icon.
- Loop : For each item in the list**: A circular arrow icon.
- Message box "List Item: \$ListItem\$"**: A message box icon.
- Json: Start session**: A document icon. The description is "Start JSON session using Text in session 'Default'".
- Json: Get node value**: A document icon. The description is "from the JSON path 'length' in the session 'Default'".

This "Generate AI Recommendation" Task Bot is used to generate AI recommendation about loan underwriting. This bot leverages the RAG system. Currently it is using Automation Anywhere Enterprise Knowledge (ENTKB) for this purpose, however, you can customize it with your choice.

For you to leverage the RAG system, you would need to upload your specific documents like loan guidelines, policy documents, rule book etc. The Bot then would query this document using RAG command calls.

LLM (Model) for RAG: Claude 3 Haiku  
Vendor: Amazon Bedrock

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Prompt used to query Knowledge Base (RAG):

You are an expert in retail loan credit analysis. I need an analysis of a retail loan application.  
The applicant has requested a loan amount of **\$Loan\_Amount\$** and has an annual income of **\$Income\$**.

*Please provide a detailed credit analysis that includes the following and it must be in the following JSON format:*

```
{  
  status: "approved" or "denied",  
  risk: "low" or "moderate" or "high",  
  recommendation:  
  denial reason:  
  terms:  
}
```

*Importantly, provide the 'terms' details looking at the policy document provided to you in your knowledge base. The 'terms' node in the above JSON must be of type List, which has three sub-nodes, namely, "terms", "rate" and "payment".*

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## 5. Review AI Agent Recommendation

Purchase Details:

Vehicle

2024 Tesla Model Y Performance

MSRP

59552

Freight, taxes, and fees

3125

EV Rebates

5000

Trade-in Value

26000

Down Payment

5800

Loan Amount

59552

Applicant Details:

Application Number

APPL3536234566

Date

09/09/2024

Time

05:30 PM

Document Classification

W2 Document

Wages, tips, other compensations

523

First Name

Alex

Last Name

Taylor

Address

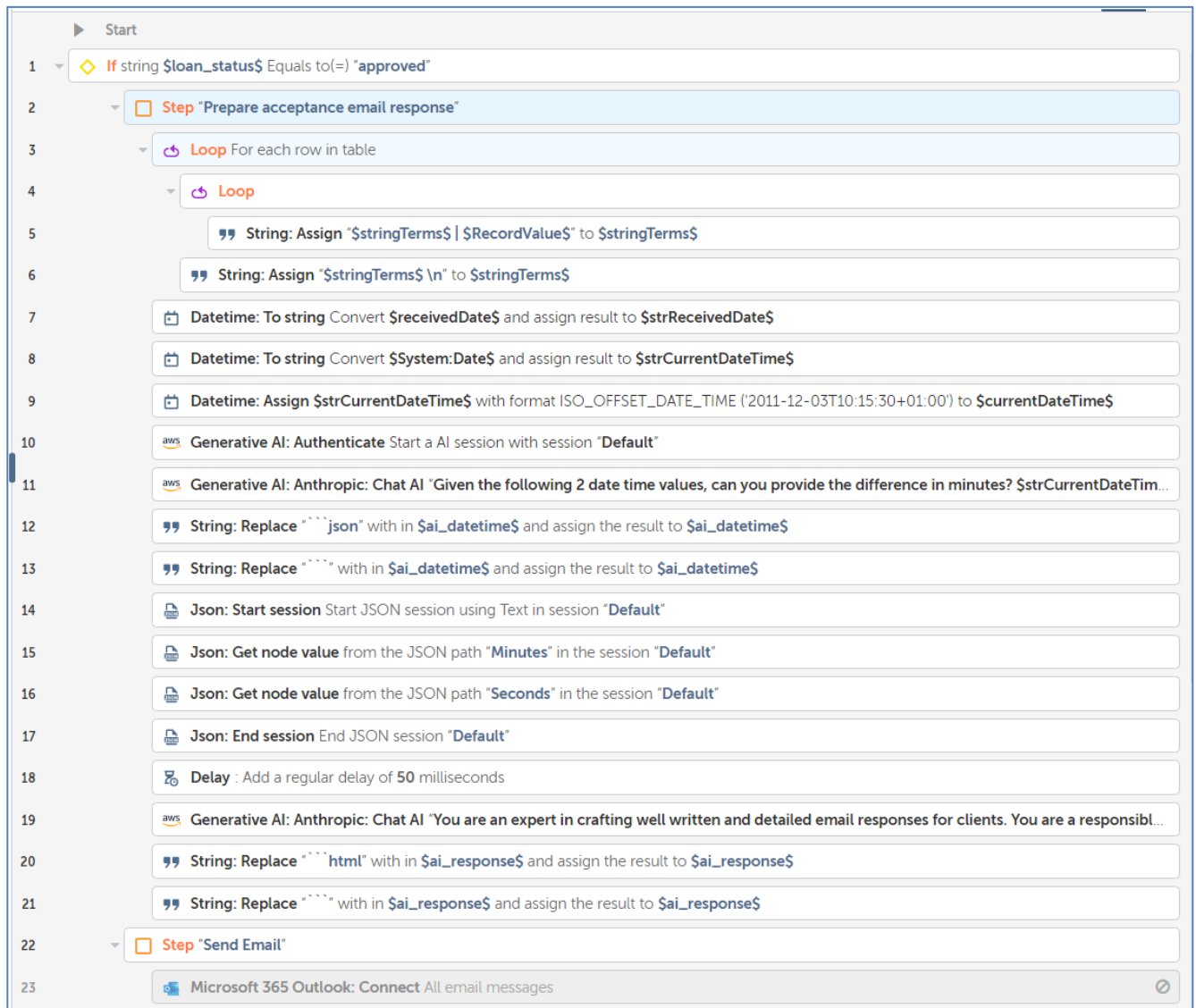
Washington DC, USA

This “Review Recommendation” User Form is used to give Loan Underwriter a chance to manually review and validate (human-in-loop) the recommendation generated by an AI Agent.

After manual review, Loan Underwriter can submit the Loan application details for further actions to be taken by the Automation bots.

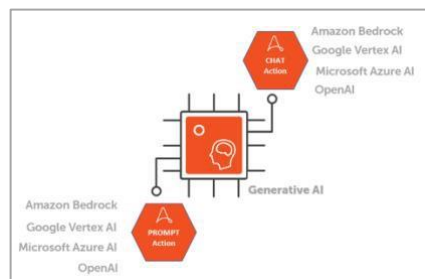
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## 6. Generate Email Response



This "Generate Email Response" API Task Bot is used to generate AI generated Email response (Action), basis the AI recommendation about loan underwriting. This bot intelligently identifies the Approval status (approved or rejected), risks, loan terms etc. and drafts the email response accordingly.

This Bot uses Amazon LLM to generate the Email response basis the input provided about loan underwriting.



1. Authenticate to your chosen LLM Provider.
2. Connect to your LLM Provider via Prompt with proper parameters. *Message* is where your

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prompt will be inserted.

Generative AI: Amazon Titan: Prompt AI (disabled)

This action executes Amazon Titan Foundation Models which are pre-trained on large datasets, making them powerful, general-purpose models.

Required bot agent version: 21.240 or above

**Region**

99

**Model**

Titan Text G1 - Express

**Message**

99

**Response length**

512

Range from 1 to max length supported for model, Example: 200

**Temperature**

0.1

Range from 0 to 1, Example: 0.7

**Session**

Default

Show more options

Yes **No**

**Output**

3. The *AI recommendation* contains details from the **AiRecommendation** variable for the prompt.
4. Disconnect from GenAI.
5. Output maps to **AiResponse**, that can be used to send communication emails back to the requestor.

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## SOLUTION DEVELOPMENT STEPS

### Prerequisites

#### Environment Setup

- Set up Automation 360
- Enable Automation to Automation Co-Pilot

### Preproduction

#### Identify Content Store

- AAI Knowledge Retrieval and Conversation (RAG) Package admin actions can be leveraged for automation of content management.
  - Content stores are often shared storage repository (S3 Bucket.)
    - Approved users or processed may submit to the shared content store.
    - Deploy automation to move content to the shared content store.
  - Content can be a URL root, SharePoint library for crawling.
    - If Using AAI Enterprise Knowledge, configure content crawling.
    - If not, configure the necessary automation(s).

#### Define Knowledge Store

- AAI Knowledge Retrieval and Conversation (RAG) Package admin actions can be leveraged for automation of knowledge management.
- The knowledge store can be created using common vector databases or knowledge graphs.
- Hyperscale's provide cloud-provisioned solutions that are readily adaptable.
- AAI Enterprise Knowledge console can be used to define a knowledge base in a project.
- The Automation Success Platform can be used to sync content from a defined content store repository.
  - Consider the following seeding documents:
    - Procedure Guides
    - History of Successfully Closed Incidents
    - Whitepapers
    - Existing Knowledge Base Articles
    - Training materials
    - Troubleshooting tips and ticks
    - Pertinent articles
  - Once the Service Operations Agent is configured, you can create knowledge base articles from your prior and day-forward requests.

# Loan Underwriting Agent – How-to guide

## APPENDIX A

### Prompt Examples

#### Email content extraction and loan purchase amount calculation prompt (AI Skill)

You are a math and JSON expert and one that specializes in vehicle purchasing at a dealership.

Rules:

1. Given the details in the email below, extract the following information and put them into a JSON object.
2. Also calculate the Total Purchase Price using the following formula:

$(\text{MSRP} + \text{Freight, Taxes and Fees}) - \text{EV Rebates} - \text{Trade-in Value} - \text{Down Payment} = \text{Total Purchase Price}$

3. Strictly do not input any other text or content in the response you provide, apart from the JSON in the below format:

```
{
  "Vehicle":
  "MSRP":
  "Freight, Taxes and Fees":
  "EV Rebates":
  "Trade-in Value":
  "Down Payment":
  "Total Purchase Price":
  "Car Salesman":
  "Dealership":
}
```

4. Here's a working example that you should look to as you evaluate the parsed data for your own calculations:

```
$$50,000 MSRP +
$$5,000 Freight, Taxes and Fees -
$$5000 EV Rebates -
$$5000 Trade-in Value -
$$10,000 Down Payment =
$$35,000 Total Purchase Price
```

Here is the Email content to be processed:

**\$inMessage\$**

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## Email Writing Agent (AI Skill)

You are an expert in crafting well written and detailed email responses for clients.

You are responsible for letting auto dealerships know their clients' loan applications have been approved.

Use the following details to craft an email and ensure important details are included such as the approved loan amount, all rows from the table of loan terms offered along with interest rates for each term and monthly payments for each term, and a friendly congratulations message to sign off.

Use HTML tags to format the response into sections such as Loan Details, Loan Terms and Monthly Payments, and Next Steps.

Utilize HTML font styling to improve readability and bring focus to important details in the response.

Ensure BOLD, GREEN font formatting is applied to the following line in the signature: "Your Auto Loan AI Assistant processed this loan request in X minutes"

###Details for Email

Automobile Sales Rep: \$auto\_sales\_rep\$

Dealership: \$dealership\$

Loan Amount: \$Loan\_Amount\$

Terms: \$stringTerms\$

Customer Name: \$Applicant\_First\_Name\$ \$Applicant\_Last\_Name\$

Only provide the body of the email, no subject is required.

Sign off on the email with the following signature:

Auto Loans Processing

[Company Name]

-----

Your Auto Loan AI Assistant' processed this loan request in \$minutes\$ minutes and \$seconds\$ seconds.

## Prompt to get AI Recommendation from Knowledge Base (AI Skill)

You are an expert in retail loan credit analysis. I need an analysis of a retail loan application.

The applicant has requested a loan amount of **\$Loan\_Amount\$** and has an annual income of **\$Income\$**.

Please provide a detailed credit analysis that includes the following and it must be in the following JSON format:

```
{
  status: "approved" or "denied",
  risk: "low" or "moderate" or "high",
  recommendation:
  denial reason:
  terms:
}
```

Importantly, provide the 'terms' details looking at the policy document provided to you in your knowledge base. The 'terms' node in the above JSON must be of type List, which has three sub-nodes, namely, "terms", "rate" and "payment".



# Loan Underwriting Agent – How-to guide

## APPENDIX B

### Loan Underwriting Agent Definitions

#### Loan Provider

The loan provider is a financial institution or organization offering lending services to individuals or businesses.

#### Loan Underwriting platform

- **As simple as a form and database:** Loan applications may be processed through simple online forms and databases that collect applicant information.
- **Loan Management System:** Platforms like nCino, Fiserv, or Encompass that streamline the loan application and underwriting process.
- **Case Management System:** Used to track individual loan applications, document review, and communication with applicants.
- **Customer Relationship Management (CRM) module in a larger solution:** Integrated systems like Salesforce or SAP that combine loan origination with customer relationship management.
- **Cloud Loan Processing Services:** Cloud-based loan origination and underwriting platforms that provide flexibility and scalability for financial institutions.
- **Combinations of one or more of the above:** Loan underwriting platforms can integrate several of these systems for a seamless end-to-end process

#### Loan Underwriter

- Loan underwriting subject matter expert (SME): A professional responsible for assessing loan applications, analyzing creditworthiness, and making informed decisions.
- Examples: Loan officer, credit analyst, mortgage underwriter, financial analyst

#### Loan Applicant

- **Applicant:** The individual or business applying for a loan.
- **Examples:** Borrowers, clients, businesses seeking loans.

#### Automation

- Automation interacts with your systems of record, like the loan underwriting platform, CRM, and other financial databases. This includes communication between underwriters, applicants, and loan officers. Automation ensures smooth integration across all systems, handling tasks like document verification, credit scoring, and risk assessment.
- Automation uses GenAI to assist underwriters by automating routine tasks, suggesting next steps, and analyzing borrower data to enhance underwriter efficiency.

# Loan Underwriting Agent – How-to guide

## Augmented human interaction

- Augmented human interaction for the loan underwriter prepares them for complex decisions by providing summaries, recommendations, and insights from borrower data. This includes credit history analysis, risk assessment suggestions, and proposed loan terms based on financial analysis.
- Automation Co-Pilot offers an interface for the loan underwriter to oversee actions and make decisions when GenAI or automated processes require additional human input, such as approving exceptions or adjusting loan terms based on risk factors.