



Always-On Outbound Customer Engagement

STUDENT GUIDE

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Pegasystems Inc.
1 Rogers Street
Cambridge, MA 02142
Phone: (617) 374-9600
Fax: (617) 374-9620
www.pegasystems.com

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Essentials of always-on outbound

Working of the always-on brain in outbound

What do customers expect from business?

Customers are more empowered than ever before. As a result, they have very high expectations of the experiences they receive from their service providers. These experiences must be meaningful, consistent, and personalized across every channel they interact with.



In alignment with customer expectations, Pega Customer Decision Hub™ is designed to deliver the right message, to the right customer, at the right time, on the right channel.

This approach not only provides a better experience for customers, it helps the business improve its customer relationships over the long term.

The always-on brain

Pega Customer Decision Hub is the “always-on brain” that acts as a single, centralized decision authority.



The always-on brain carries out 1:1 customer engagement across channels.

“Always-on” means that the brain constantly monitors each customer’s context across channels. When it detects a need, it selects and delivers the appropriate offer, retention message, or service recommendation in the customer’s preferred channel.

The brain uses data about the customer, including past behavior, profile information, and contextual data that may, for example, stream from their device, as input. It leverages advanced AI techniques to predict customer context, propensities, and relevance. It also uses stored decision strategies to trigger messages and actions at the moment the customer will be most receptive to them. As a centralized resource, the brain enables you to deliver consistent and personalized Next-Best-Actions across all channels.

Customer engagement channels

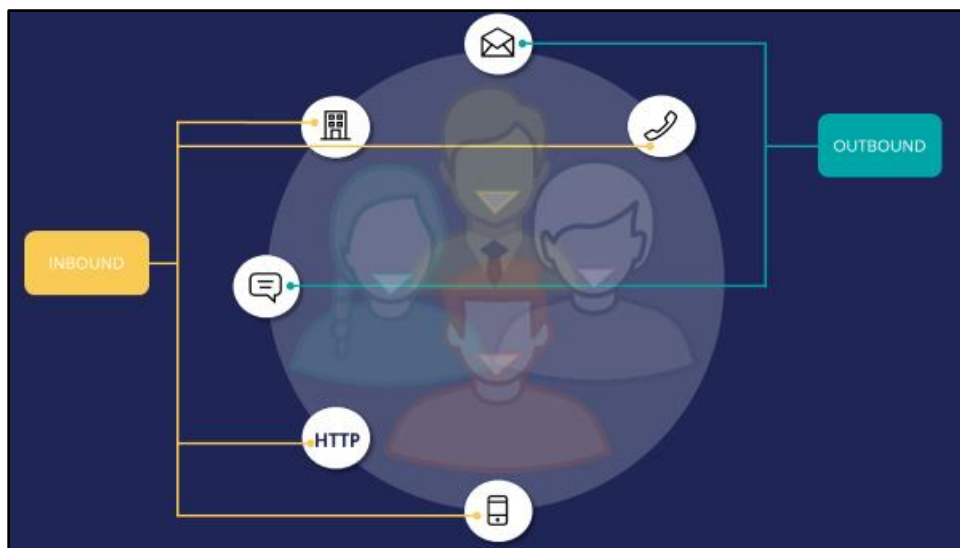
Customer interactions take place on various channels, which can be broadly classified as “owned” and “paid”.



Owned channels are the channels owned by the business, such as a self-service web portal, contact center, or mobile application. In these channels the business has more control over customer engagement activities.

Paid channels are owned by a third party, for example social media platforms such as Google and Facebook. Businesses have to pay to use these channels for customer engagement activities.

Owned channels can be further classified as inbound and outbound channels.



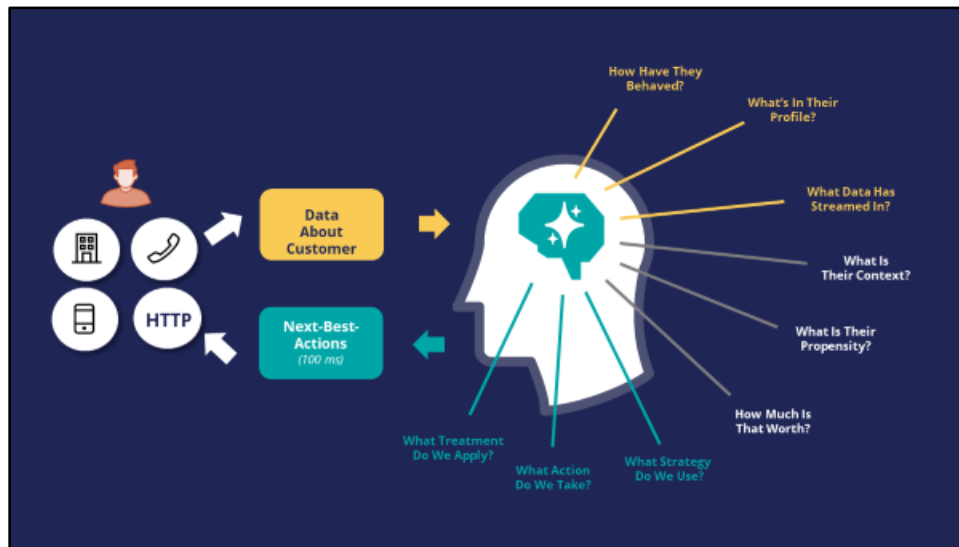
An inbound channel is used when a customer approaches the business, via, for example, a self-service web portal.

An outbound channel is used by the business to send a message to the customer, via, for example, email or SMS.

The flow of information and the mechanics of delivering Next-Best-Actions is different in inbound and outbound channels.

Inbound interactions

When a customer interaction takes place on an inbound channel, the channel identifies the customer, then the brain evaluates the Next-Best-Action for that customer and sends the result back to the same channel, in real-time. The customer's response to the action is recorded by the system, and the cycle repeats.

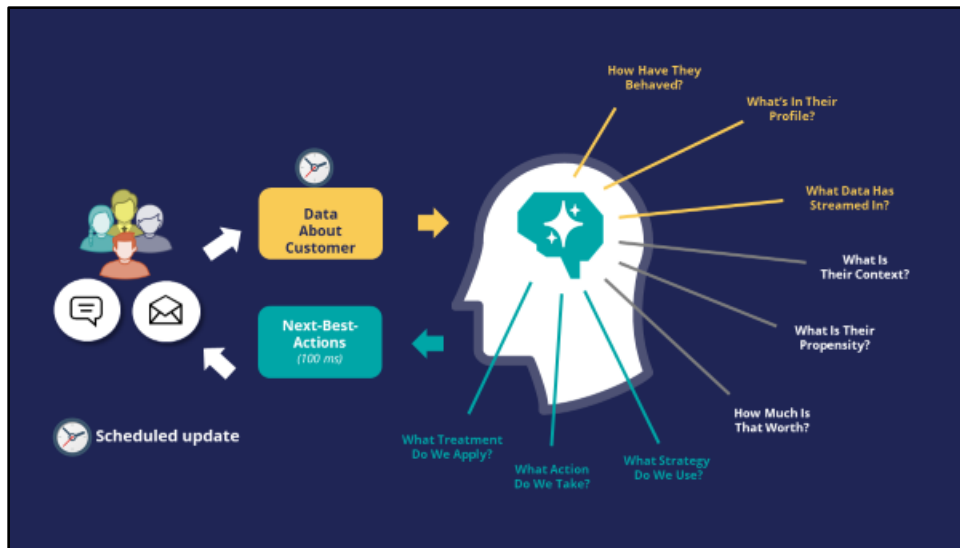


Outbound interactions

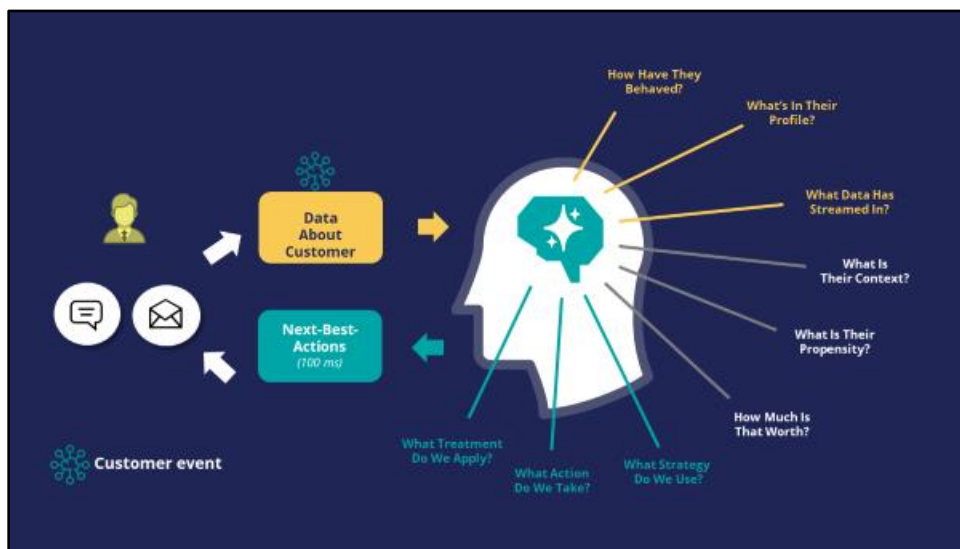
Always-on outbound means that the brain sends outbound messages, via email or SMS, to customers only when it's appropriate.

This can happen in three ways:

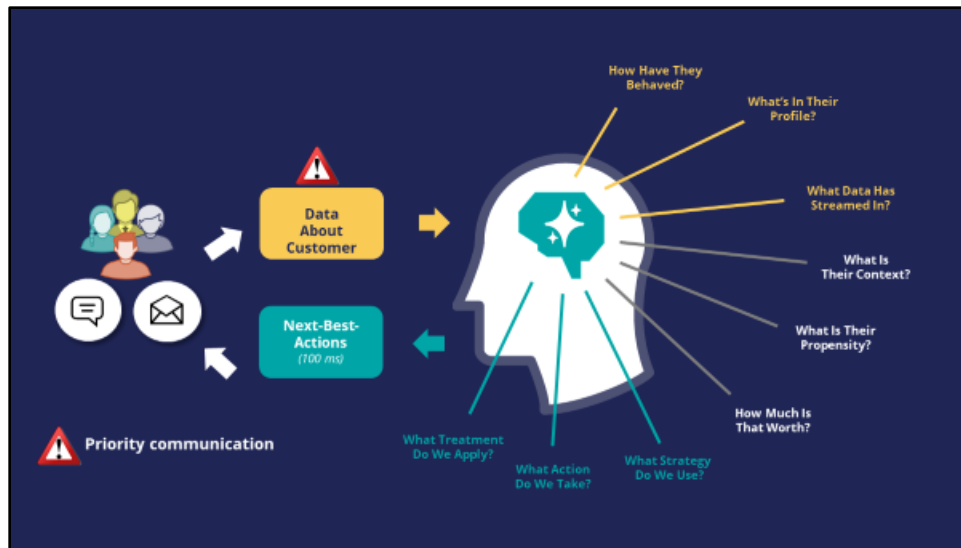
1) **Scheduled update:** The brain is configured to proactively send out messages on a scheduled basis when relevant. It evaluates the Next-Best-Action for each customer identified in a segment, which contains the potential list of customers to whom you want to send messages. In most cases, customer responses arrive after the message has been sent. When customers respond, the responses are recorded in the system and used in the subsequent Next-Best-Action evaluation.



2) **Customer event:** When a customer event is detected that is of significance to the business, for example, a customer abruptly ends an online transaction, data is received via the event stream. The brain then evaluates the Next-Best-Action and sends the resulting action, such as a notification email with a link to continue the incomplete transaction, to the customer. In this case, the outbound message is triggered only for the customer for whom the event occurred.



3) **Priority communication:** In extreme circumstances, you may want to contact all or a subset of your customers outside the regularly scheduled update. In such cases, you would configure the brain to send out a high-priority communication to those customers. This would be a one-off communication and won't be repeated automatically by the system.



Traditional marketing versus always-on outbound

Overview

As more organizations switch from traditional marketing approaches to 1:1 customer engagement, there is a need to compare and contrast the terminologies used in the two approaches.

Here are some key terminologies and concepts used in traditional marketing, translated into concepts in the always-on, Next-Best-Action approach.

Marketing campaigns and programs

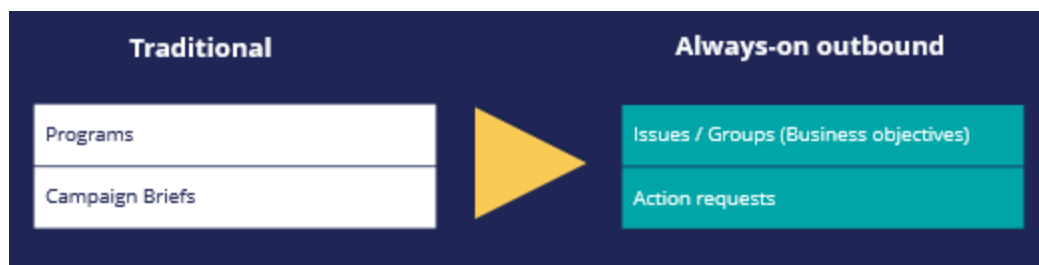
In traditional marketing, a marketing program is a set of activities designed to meet marketing objectives by grouping campaigns into logical business outcomes.

In the always-on approach, marketing programs translate into hierarchies of **Issues** and **Groups**. You can use your existing marketing objectives and desired outcomes to define the Issue/Group hierarchies that best meet your needs.

For example, a marketing program could be designed to address the business objective of decreasing dormancy in credit card usage. In this case, you would design a series of marketing campaigns that target infrequent credit card users, encouraging them to use their cards with various offers such as additional bonus points or discounts. In the always-on approach, this translates into defining the Issue as, in this case, *Dormancy*, and the Group as *Promotions*. Under this group, you would then create actions called *10% additional bonus points*, or *5% discount*, and so on.

As a marketing operations person, you receive campaign briefs, which are documents you can use to create **Actions**.









A campaign translates into an action or a set of actions delivered to qualified customers. In the always-on approach, you put an action into or out of play by changing its availability setting. The advantage in the always-on approach is that any adjustment to an action will propagate across all Issues and Groups, which means that you are optimizing across all programs and campaigns at once.



Segmentation

Traditionally, you would use the term segment, audience, or population interchangeably to refer to the target audience of a Campaign, and you would define granular criteria to identify this audience.

In the always-on approach, audience segmentation translates into engagement policies combined with Artificial Intelligence (AI).

Traditional	Always-on outbound
<div>Onboarded Start with CUSTOMERS : 253</div> <div>A LifeCyclePeriod contains 'Onboard'</div> <div>Average income Intersect CUSTOMERS : 53</div> <div>A Income between '1000' and '3000'</div> <div>High balance Intersect CUSTOMERS : 23</div> <div>A AverageBalance greater than '1000'</div> <div>Young Intersect CUSTOMERS : 9</div> <div>A Age between '25' and '45'</div>	<div>E Eligibility   (LifeCyclePeriod is equal to Onboard)</div> <div>A Applicability   No group criteria defined</div> <div>S Suitability   (AverageBalance is greater than 1000)</div> <div>T Targeting   (Age is greater than or equal to 25) or (Age is less than or equal to 40 and Income is greater than or equal to 1000) or (Income is less than or equal to 3000)</div>

By understanding the purpose of traditional segments, you can translate them into eligibility, applicability, suitability and contact policy rules.

When selecting targets, any criteria that are not based on clear business rules should be avoided. For example, targeting a specific demographic such as an age range or income level based on market research or intuition is not necessary. In the always-on approach, it's the job of the AI to choose the right action for each customer, once all disqualified actions are filtered out.

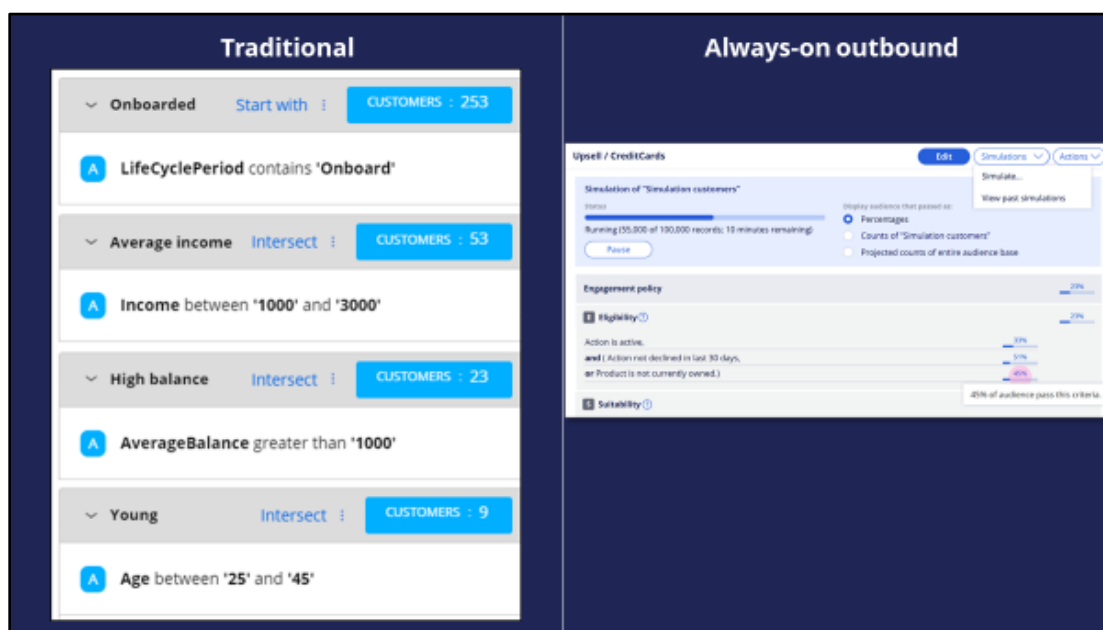
In the above example, the lifecycle period criterion is translated into an eligibility condition as it a definite requirement of the business. The Average balance criterion is translated into a suitability condition as the business thinks the group of actions will be appropriate for customers who have such a balance. However, targeting an age range or income-based demographic are not clear business requirements. These conditions in the traditional

approach are coming more from intuition and some offline analysis. Therefore, in the new always-on outbound approach, these conditions are not part of engagement conditions but are left to the AI. The AI will take care of finding the right customer segments that are more likely to have a positive response to the configured offers.

Segments, in the new approach, are used only to identify the starting population for an always-on outbound schedule. For example, the starting population could be all customers who have opted in to receive promotional messages.

Segmentation reports

Traditionally, you might have used segments to generate reports on customers who match specific criteria.



In the always-on approach, you use reports generated by the simulation facility in Next-Best-Action Designer to:

- Understand customer counts.
- Validate the effect of changes to engagement policies and AI controls.
- Visualize the action mix.

Volume caps

When dealing with any form of outbound communication, there is a need to limit the number of communications both on a per-customer basis and in terms of total messages generated by the system over a given time period.

In the always-on approach, you use volume constraints, contact limits and suppression rules to set caps on communications.

Volume constraints

Customer contact limits

Channel	Contacts per customer	Duration
Email	1	Weekly
SMS	1	Weekly

Contact policy library

- > 7-day action impressions: Track Impressions for the action over the past 7 days
- > 7-day group clicks: Track Clicks for all actions in the group over the past 7 days
- > 30-day sent count: Track Pending for all actions in the group over the past 30 days
If there are 2 Pending for Email treatments, suppress the action for 60 days

How should multiple actions for a customer be treated?

☒ Individually for each action ☐ As a group for the customer (output all actions)

Reset constraint counts

☒ Individually ☐ All at once

Volume constraints list:

- > Maximum 50 With Channel: Email, Action: StandardCard
- > Maximum 100 with Channel: , Type: Master

[+ Add definition](#)

Scheduling

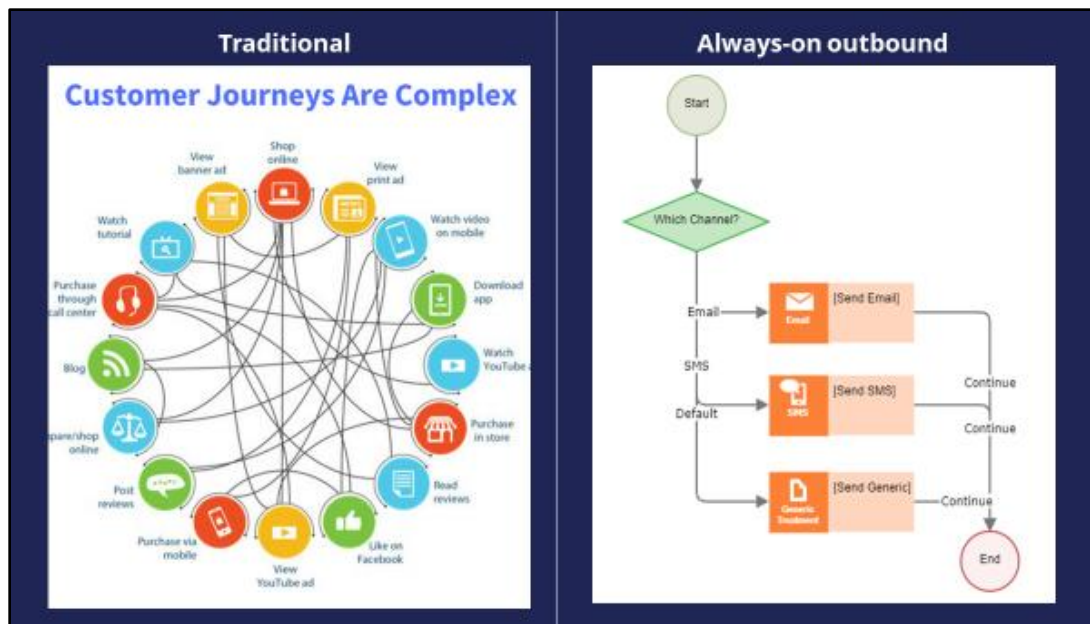
In a traditional marketing approach, there are several options to control the campaign schedule. For example, you can run a campaign as a one-off, or as recurring daily, weekly or monthly.

In the always-on approach:

- The schedule is always-on, it runs at a set frequency, for example on a daily basis.
- Actions are marked as in or out of play using the action 'availability' option.
- Emergency schedules can be set-up as secondary schedules.
- Contact policies help prevent communication fatigue in customers.

Journey guidance

Traditional campaign journeys can be long and complex. They are designed as deterministic journeys in which one campaign triggers the next, which triggers a third, and so on.



The always-on approach turns managing complex journeys into managing experiences:

- Logic in the channels should be minimized to focus on the overall experience. The number of steps involved in outbound communication, represented by action flow shapes, should be limited to 2 or 3 per channel.
- Next-Best-Action combines many actions to optimize experiences. Let the Pega brain decide the next step.
- Action flows shouldn't contain decision logic (that's in the brain) and should not try to adapt to customer or business changes.
- Use business hierarchies (Issues/Groups) to organize the business outcomes and actions that collectively make up experiences.

Business use case: Always-on outbound customer engagement

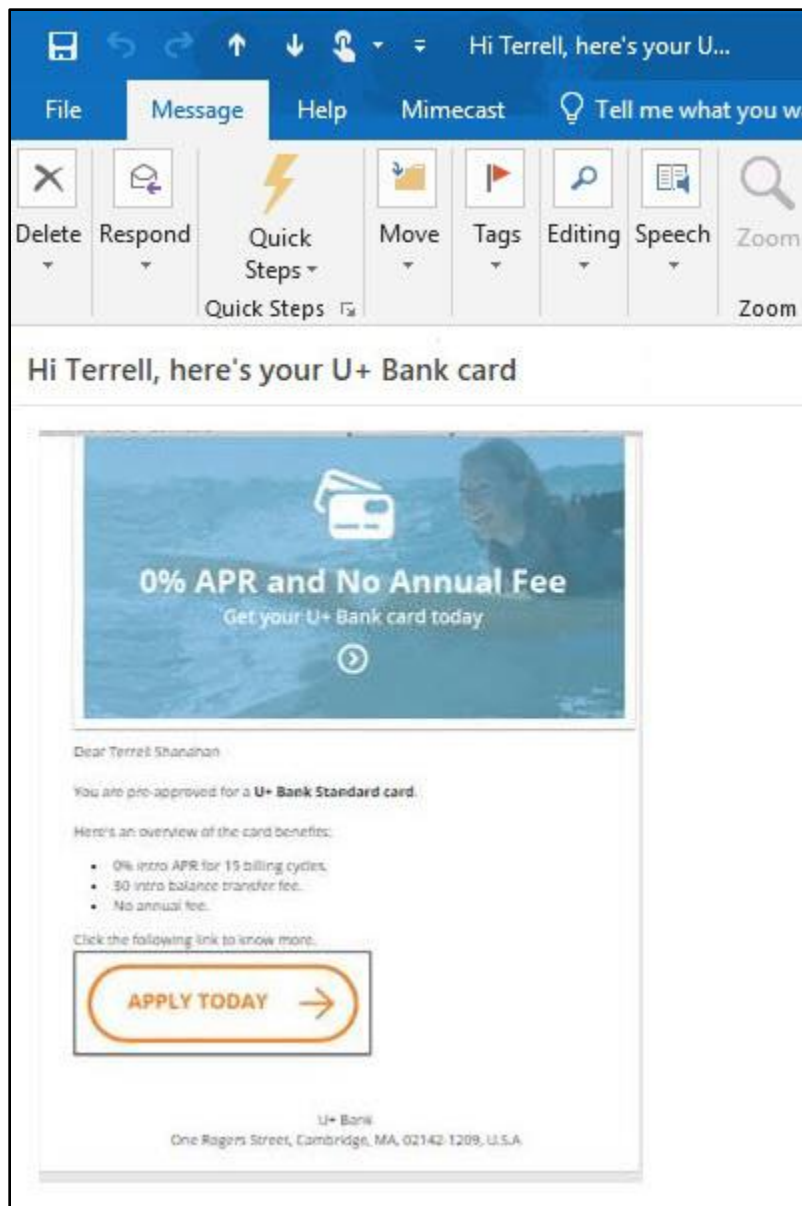
Introduction

U+ Bank has recently implemented the cross-sell on the web microjourney with the goal to increase the engagement with their customers on the web channel. The bank uses Pega Customer Decision Hub™ to recommend relevant banner ads to its customers when they visit their personal portal.

Customer Decision Hub combines customer information, information about their past communications with the bank, current contextual information, business rules and the predicted customer behavior, as calculated by Artificial Intelligence (AI) to select the Next-Best-Action, which in this case is the best sales offer for each customer.

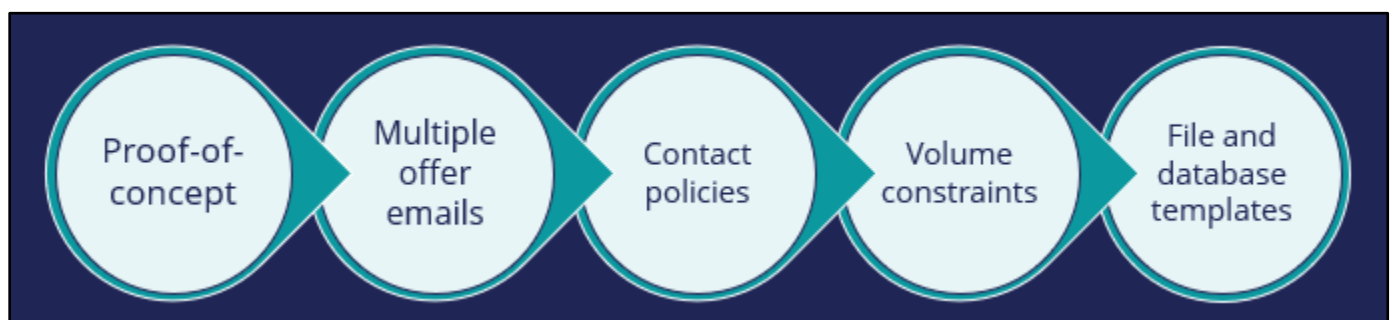
Satisfied with the results of the first microjourney, the bank now wants to extend these Next-Best-Action recommendations to be delivered via one of their outbound communication channels, email.

In this microjourney, the main intent of U+ is to increase the customer engagement on email channel. This can be measured by the click-through rate. A click-through metric is recorded when the customer clicks on the 'APPLY TODAY' button in the email received.



Implementation phases

The marketing operations team plans to implement the requirement in multiple phases.



The first phase is a proof-of-concept phase. In this phase, the goal is to send a credit card offer via email to qualified customers. This requires adding an email treatment and configuring the flow to an existing action, enabling the email channel, and configuring the always-on outbound schedule.

As a result of this phase, the Standard card offer details will be sent to qualified customers in an email. For example, if a customer, Stephen John, qualifies for the Standard card offer, the always-on outbound will send him an email with the offer details. He can click on the 'APPLY TODAY' button, it takes him to the credit cards page on the bank's website where he can read more details about the offer and apply for it, if interested.

In the second phase, the bank plans to include more credit card offers to be promoted via email. For example, if a customer is eligible for more than one credit card offer, he will be presented with the top offer he qualifies for. The prioritization uses AI and other factors such as business weights and levers to select the top offer for a customer.

In the third phase, the bank would like to introduce contact policy rules to ensure that a customer does not receive the same offer message twice within a period of time. For example, a customer will not receive an offer email for 60 days if one was sent in the past 30 days.

In the fourth phase, the bank would like to apply some limitations on the outbound volume due to certain operational constraints. The IT department of the bank has imposed a restriction on the number of emails that can be sent in a day. The marketing team has been asked to apply some limitations on the outbound volumes of the email.

The fifth phase is to share action details with a third-party email distributor. To comply with the security and spamming regulations, the bank has decided to use a third-party email delivery service instead of using the inhouse email server. As a result, the action details need to be written to a database table. The action details will then be shared with a third-party email distributor.

In summary, you will learn more about how U+ bank will leverage the always-on outbound capability in this phase of the project.

Sending offer emails

Sending offer emails

To market your offers, you can send offer emails to qualified customers. Pega Customer Decision™ Hub enables you to re-use existing actions and customer engagement policies configured in Next-Best-Action Designer and extend them for outbound customer engagement in the email channel.

Transcript

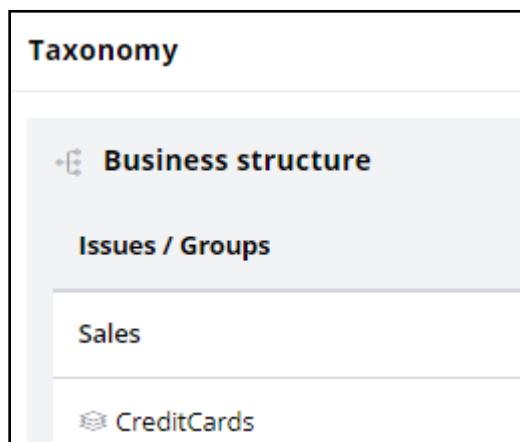
This demo shows you how to send offer emails to qualified customers.

U+, a retail bank, wants to use Pega Customer Decision Hub to send emails related to a credit card offer to qualified customers.

The email contains the offer details and a call to action. When a customer clicks the **APPLY TODAY** call to action in the email, they are directed to the credit cards page on the bank's website, where they can learn more about the offer and apply if interested.

This is the Pega Customer Decision Hub portal. Before configuring an action to send offer emails to qualified customers, look at the Next-Best-Action Designer configured by U+.


The **Taxonomy** tab contains the business hierarchy of issues and groups. Every action presented to the customer is classified within an issue/group hierarchy. In this case, the bank wants to do cross-sell/upsell of credit cards. As a result, the bank created one Issue called **Sales** and a Group called **CreditCards**.






Now, navigate to the **Engagement policy** tab to view the business rules and actions defined for the CreditCards group.

These engagement policy conditions determine which customers qualify for the actions. For example, the eligibility condition **Age is greater than or equal to 18** implies that only customers who are equal to or over the age of 18 are eligible for the credit card offers. Also, credit card offers are applicable to customers only if they do not currently own a credit card.












Notice that a consultant has already created a few actions under the Sales/CreditCards hierarchy.

 Offers
5 Offers (4 with specialized policies)
<hr/>
Standard card
<hr/>
Rewards card
<hr/>
Rewards Plus card
<hr/>
Premier Rewards card
<hr/>
Email flow template

These actions correlate with the credit card offers that the bank wants to promote.

Engagement policy
<hr/>
E Eligibility 
(isCustomer is true)
and (Age is greater than 18)
and (Risk Segmentation has results for Low Risk)
<hr/>
A Applicability 
(Has Cards is equal to N)
<hr/>
S Suitability 
No group criteria defined

Currently, the bank promotes credit cards on the web channel only. The bank wants to extend this promotion to the email channel.

Channels		
 ATM <input type="checkbox"/>	 Call center <input type="checkbox"/>	 Direct Mail <input type="checkbox"/>
 Email <input type="checkbox"/>	 IVR <input type="checkbox"/>	 Mobile <input type="checkbox"/>
 Paid <input type="checkbox"/>	 Push notification <input type="checkbox"/>	 Retail <input type="checkbox"/>
 SMS <input type="checkbox"/>	 Web <input type="checkbox"/>	

The bank wants to begin by sending the Standard card offer emails to qualified customers. To send emails in an always-on outbound environment, you need to add an email treatment to the action.


Open the **Standard card** action to add an email treatment.

Edit Offer: Standard card [Available]
 Sales • CreditCards • StandardCard [PegaCRM-Artifacts:](#)


Details **Engagement policy** **Treatments** **Flow**

Default content URL [?](#) [↗](#) Default

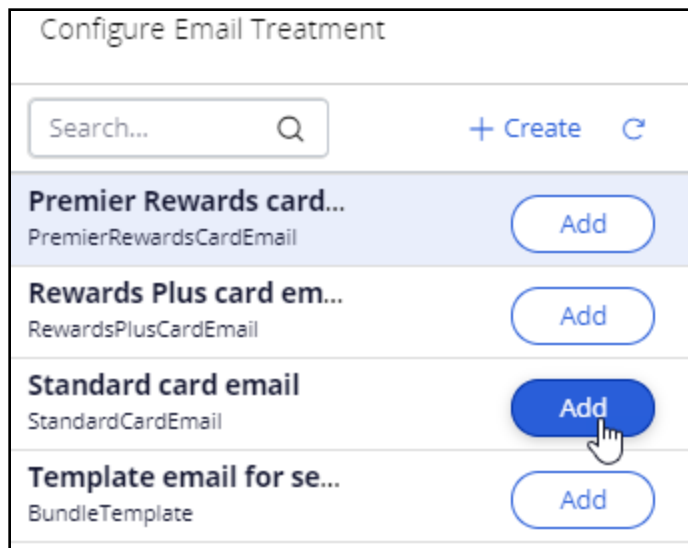
Web

 **Standard card tile**
 Standard card tile

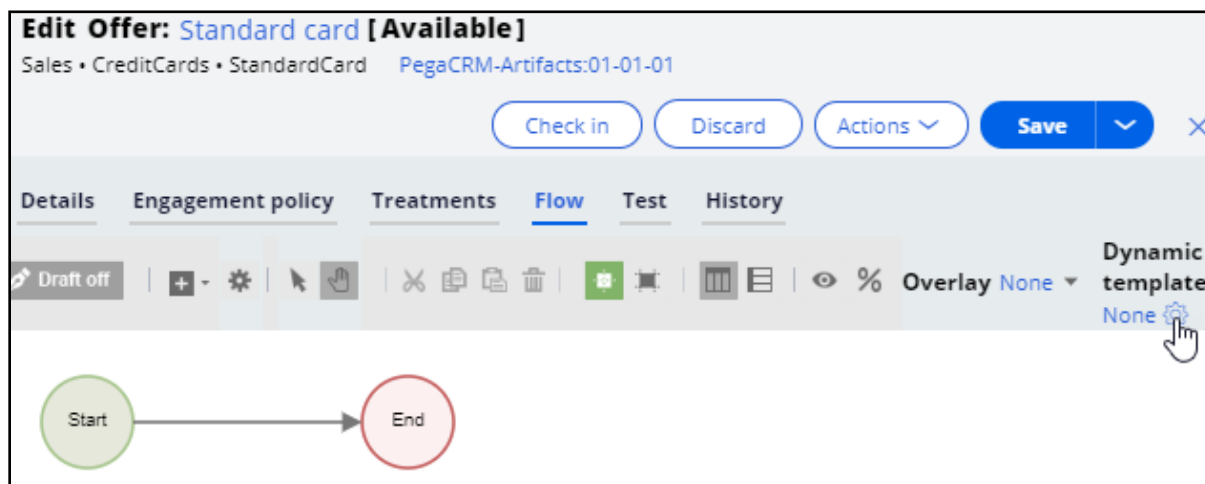
Add channel [v](#)

Agent assisted
 Email 
 Mobile

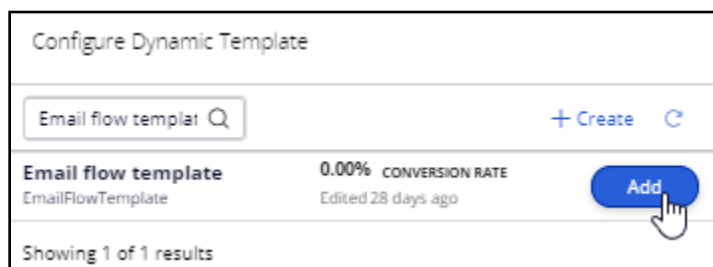
You can use an existing treatment or create a new one. In this case, you use an existing email treatment.



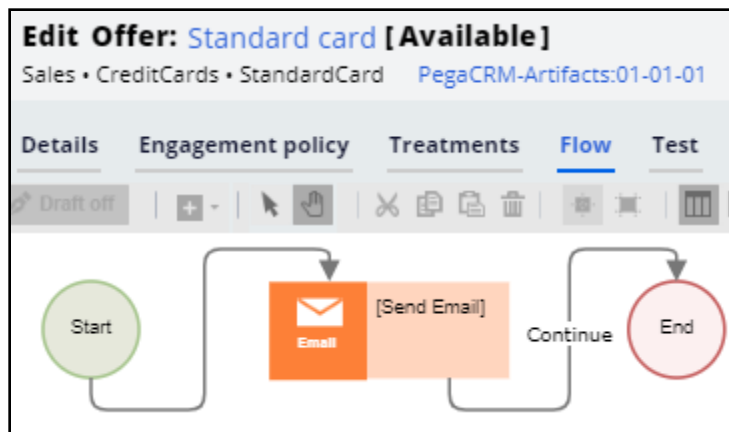
Next, you must configure the action flow. The action flow is a flow diagram that contains the sequence of steps carried out during the lifecycle of an action. You can create action flows once and reuse the flows across actions by using the **Dynamic template** option.



Now, click **Dynamic template** to add an action flow template.



Notice that the flow has only one key shape: the **Send Email** shape. It represents the outbound email delivery.



Now, on the **Channels** tab, you can enable the channels and triggers that invoke a Next-Best-Action evaluation.

In this case, as U+ wants to send out emails, enable the **Email** channel.

The 'Channels' configuration page shows a grid of communication channels with toggle switches. The channels are: ATM, Call center, Direct Mail, Email (checked), IVR, Mobile, Paid, Push notification, Retail, SMS, and Web (checked). The page includes a 'Save' button and a 'Cancel' button. The header shows 'PegaCRM-Artifacts: 01-01-01' and 'Edited 6 minutes ago by CDH Analyst'.

In the always-on outbound paradigm, the brain evaluates the next best action for each customer identified in a segment, which contains the potential list of customers to whom you want to send messages. The system can send these messages at a regular frequency (for example, daily). You configure the **Primary schedule** to set the frequency.

The schedule has two mandatory configurations: **Recurrence** and **Starting population**.

The 'Primary schedule' configuration section shows three fields: 'Recurrence' (Not yet configured), 'Starting population' (Not yet configured), and 'Volume constraint (optional)' (Not yet configured). A warning message at the top states: 'Schedule cannot be run. Confirm start date is not in the past, and starting population is selected.'

To configure an outbound schedule, first, set the required **Recurrence** frequency. In this case, retain the default frequency, *Daily*. Then, select the **Refresh the audience** check box. Enabling the **Refresh the audience** option ensures that the latest customer information is always used when running the schedule.

Configure outbound schedule


Recurring by*

Daily ▾

☒ Every weekday

☐ Every day or every nth day

Start

3/12/2020 2:10 AM 

End

☒ No end date

☐ Set number of occurrences

☐ End by a date

☒ Refresh the audience

☒ Refresh the audience for each scheduled occurrence

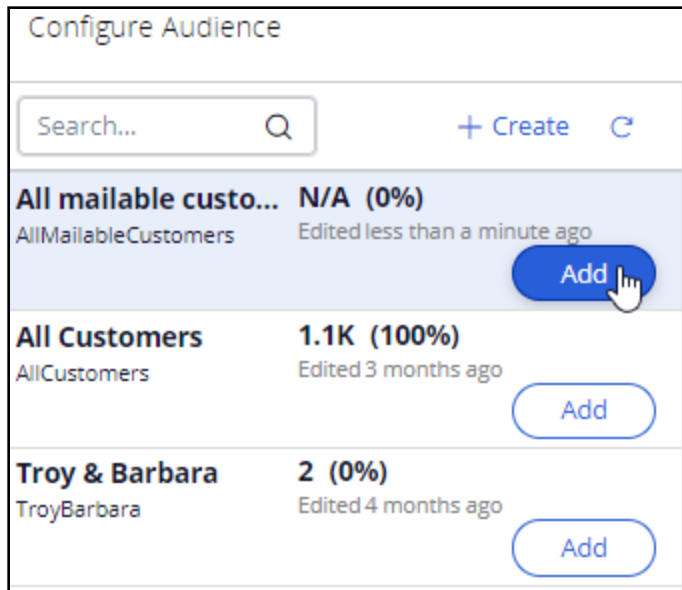
☐ Refresh the audience only for the first scheduled occurrence

☐ Write results using a database template

Cancel

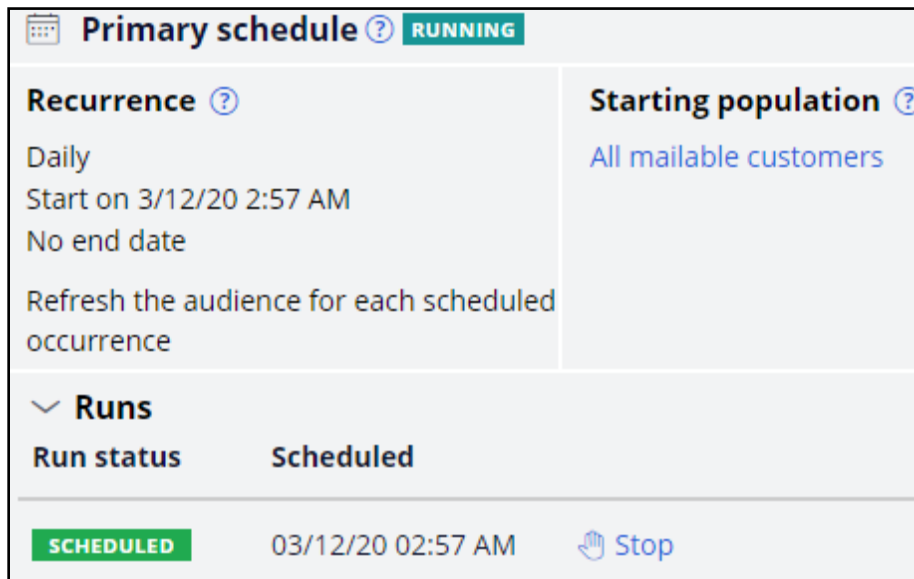
Submit

Next, select the segment that contains the list of customers to be considered by the brain for outbound messaging. Typically, this is a large population of all customers to whom you potentially want to reach out. In this case, select the **All mailable customers** segment.



With that, all the necessary configurations for this scenario are complete.

Run the schedule. When the date and time for a scheduled run are reached, an entry is displayed with the status **Scheduled**, which indicates that the run is about to begin.



When you refresh, the status changes to **Running** once processing begins.

Runs		
Run status	Scheduled	
RUNNING	03/12/20 02:57 AM	Stop
> Upcoming runs		

You can refresh to see the latest status. Once the run is complete, you can see the results of the run.

In the completed run results, you can see the number of customers selected in the **Audience** stage, which is the count of customers selected by the Segment.

You can also see the number of actions identified by the strategy, which is the count of customers selected by the brain.

The count in the **Initiated** section represents the number of actions initiated for outbound messaging. The count in the **Result** section is the number of actions that have completed all the steps defined in their action flow.

You can also see the actions in the current run, which the brain selected.

Runs			
Run status	Scheduled		
COMPLETED	03/12/20 02:57 AM		
Audience	Strategy	Initiated	Result
769 customers >	191 action results >	191 actions initiated >	191 completed
03/12/2020 03:00 AM	03/12/2020 03:06 AM	03/12/2020 03:06 AM	
Action	Count		
StandardCard	191		

Qualified customers receive the email. When they click the **APPLY TODAY** call to action, they are taken to the preconfigured URL, which, in this scenario, is the Credit Cards landing page on the bank's website.

This demo has concluded. What did it show you?

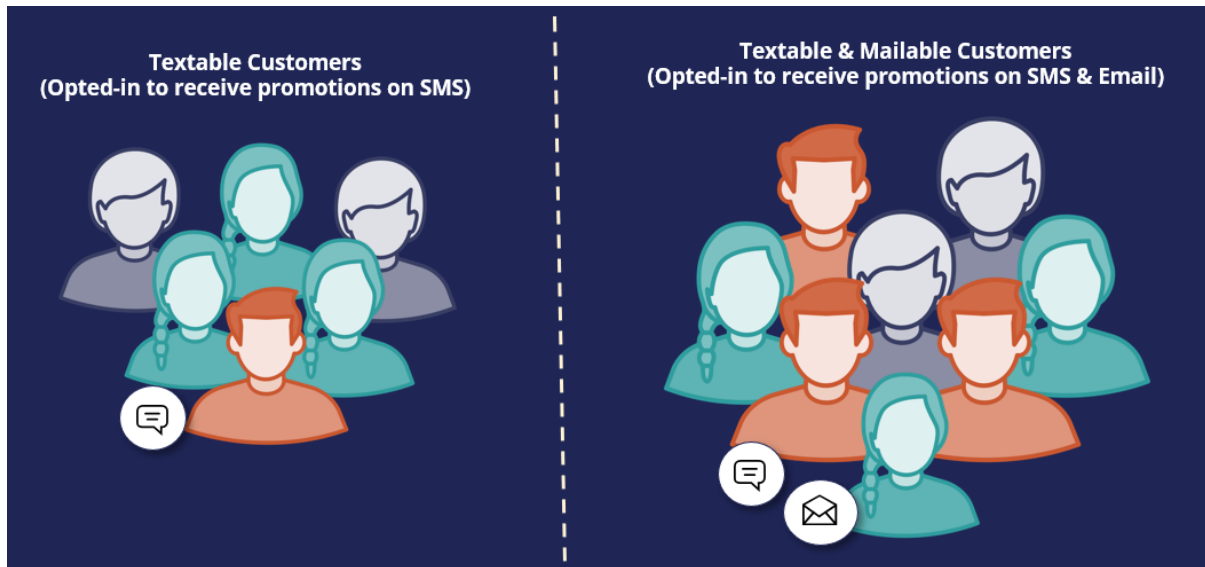
- How to enable the email channel in Next-Best-Action Designer.
- How to add an email treatment to an action to have an email offer available for the outbound run.
- How to schedule and run an outbound run.

Defining the starting population

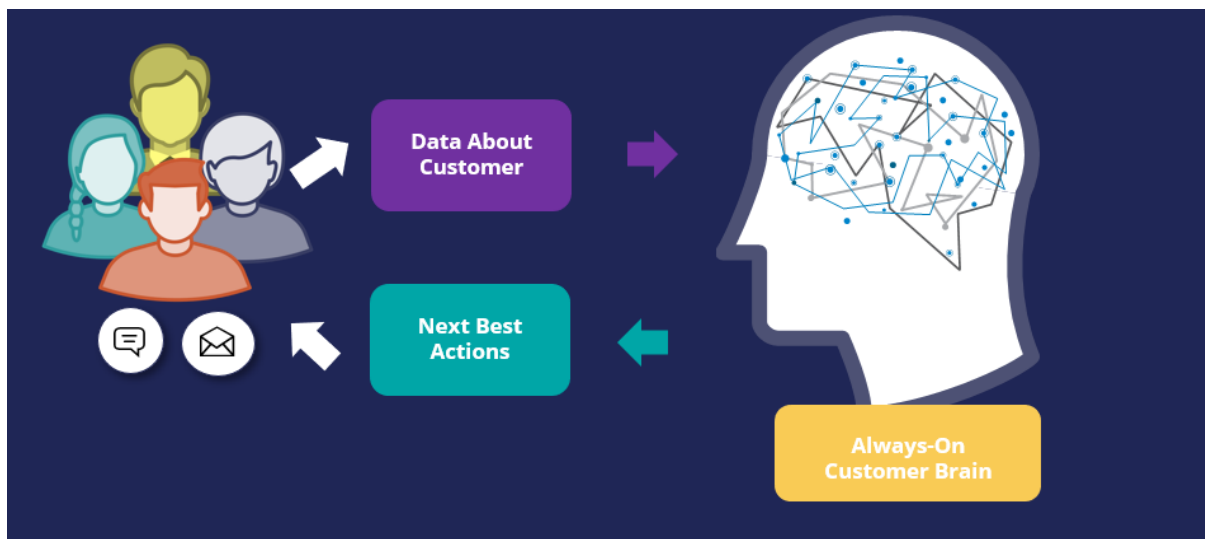
Segmentation

What are segments?

In Pega Customer Decision Hub™, the audience is a list of potential target customers, implemented using the segment component. A segment is a reference to a database table containing a list of customer IDs that match specific criteria.



In the always-on outbound paradigm, the Pega brain evaluates the Next-Best-Action for each of the customers identified in a segment, which contains the list of potential customers to whom you want to send messages.



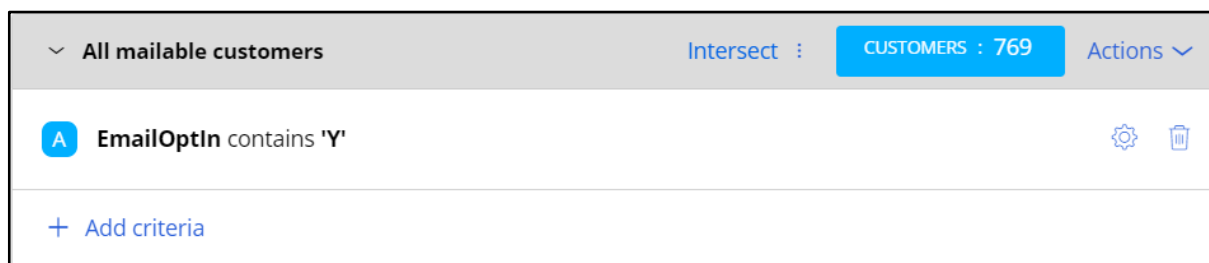
This set of customers is known as the starting population. The customers in this group will be further qualified through eligibility, applicability, and suitability criteria configured in Next-Best-Action Designer.

Criteria in a segment

To select a starting population, you apply a few high-level criteria to a segment. It's best practice not to get too granular at the segment level, rather use eligibility, applicability, and suitability rules configured in Next-Best-Action Designer to fine-tune your criteria once the starting population has been selected.

You can define one or more conditions that must be true for a customer to be included in a segment.

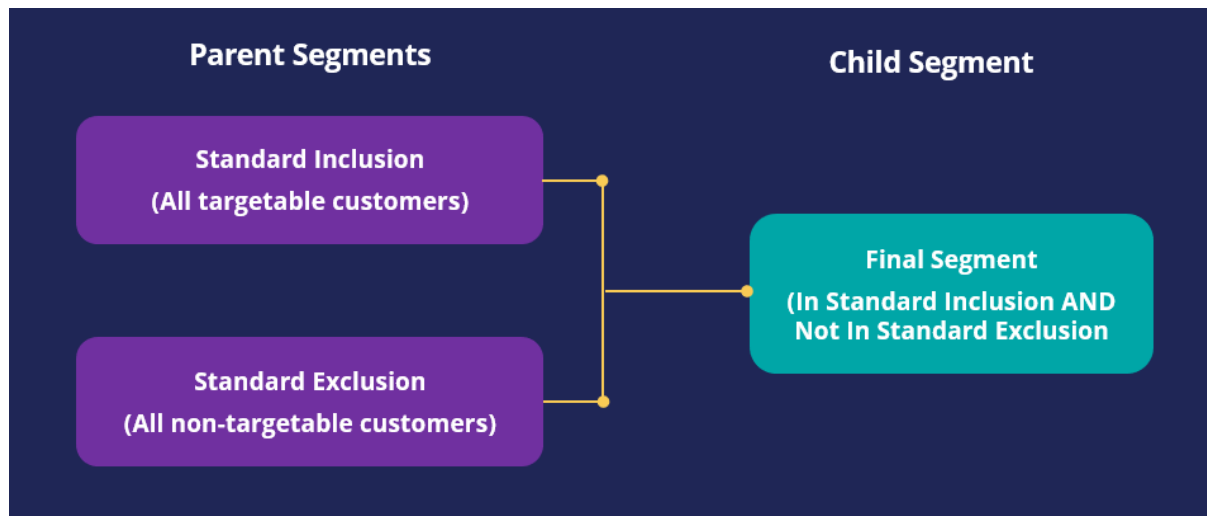
For example, to send emails related to a credit card offer to a target audience, you should first define a criterion that will filter for customers who have opted-in to receive promotional emails.



Segments hierarchy

A segment can reference a “parent” segment, enabling you to create a hierarchy of segments.

For example, you can create top-level segments that identify common lists of customers for exclusion or inclusion in various “child” Segments. Standard top-level segments allow global communication rules to be implemented by forming the basis of customer lists that automatically adhere to these rules. The rules can include, for example, standard exclusions, which are the core customers who should not be contacted, or standard inclusions, which are the core customers who may always be contacted. The resulting customer lists can be used as the starting point for creating the final segment.



If changes are made to global rules, the definitions of the standard top-level segments can be modified accordingly, and as a result, every segment that references them will automatically be re-aligned to the new rules.

Creating a segment

Business scenario

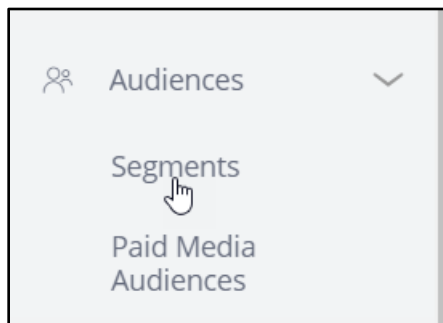
U+, a retail bank, wants to use the always-on outbound approach to send promotional emails to qualified customers. As the starting population for the outbound schedule, the bank wants to include all customers who have opted in to receive promotional emails.

Creating a segment

To meet the business requirement, you need to create a segment with two criteria.

1. A criterion to reference the existing top-level segment, ***All Customers***, which contains a list of all customers in the customer base.
2. A criterion to check if customers have opted in to receive promotional emails.

Segments are managed on the Segments landing page. The Segments landing page can be accessed from **Audiences** -> **Segments** in the navigation menu.



You can open existing segments or create a new segment from here.

Segments

↺

Create

Help

✕

Issue / Group

Type


All issues / All groups

All types

≡

Filter

Showing 4 of 4 results



All Customers

AllCustomers


1.1K

(100%) customers

Refreshed 1 month ago

Criteria

Edited 4 month ago



Troy & Barbara

TroyBarbara

2

(0%) customers

Refreshed 3 months ago

Criteria

Edited 4 month ago

Provide a short description for the new segment, and the identifier is automatically populated when you tab out.

Create Segment	Create and open
Segment Record Configuration	
<input type="text" value="All Mailable Customers"/>	Identifier AllMailableCustomers Edit
A short description or title for this record	

Entering the segment criteria

The **Design** tab is where you assemble the criteria required to identify customers of interest.

Segment criteria are grouped for ease of reading. So, before you can add the first criteria, add a criteria group.

Edit Segment: All Mailable Customers [Available]

Actions ▾

Save ▾

×

Design

Options and Schedule

Paid sync

History

Population count: -- of 1,071

Show Customers

More ▾

+ -

Add group to start building a segment

+ Add group

You can provide a more descriptive name for the criteria group.

+ Set 1 ×

Collapse groups

Expand groups

Update counts ▾

▾ Group 1

Group 1

(Double click to edit) been added

Start with :

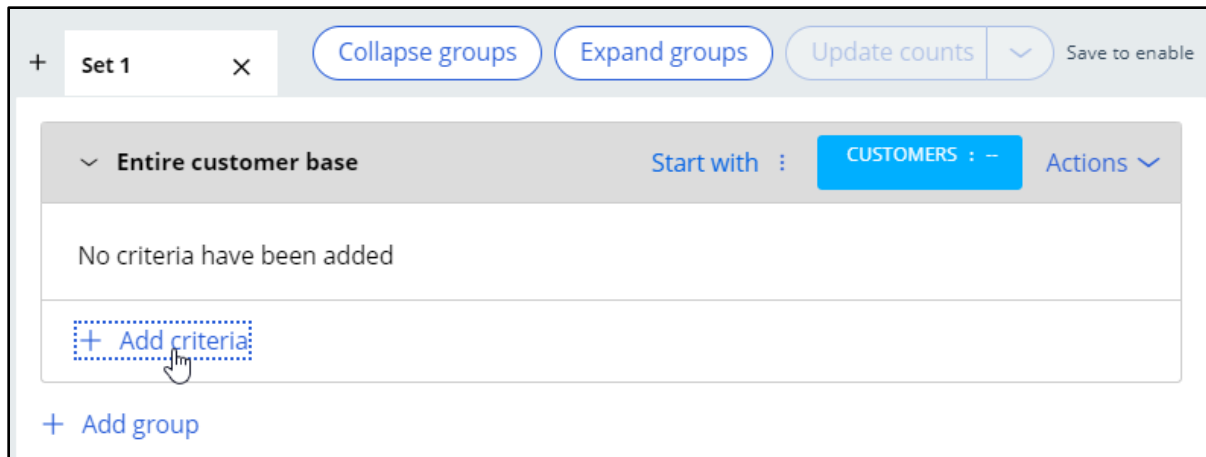
CUSTOMERS : --

Actions ▾

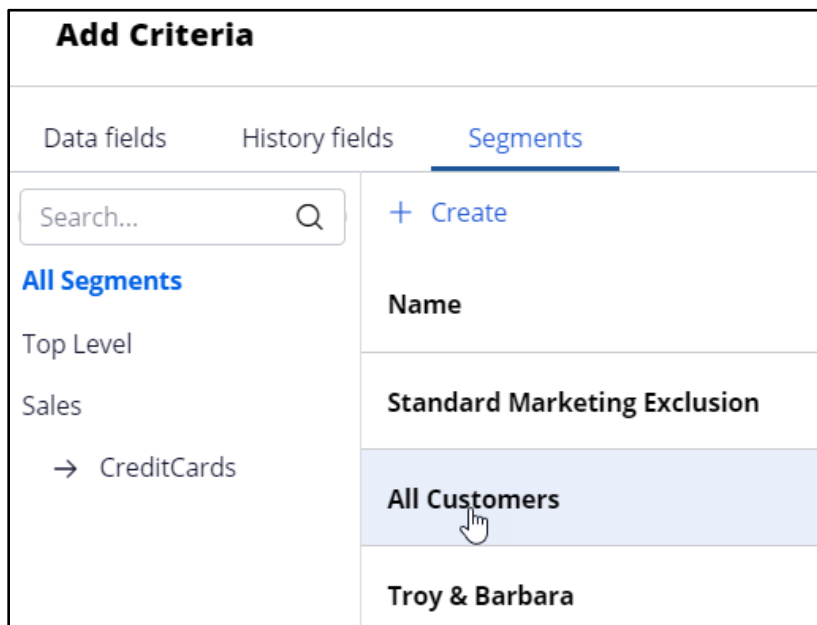
+ Add criteria

+ Add group

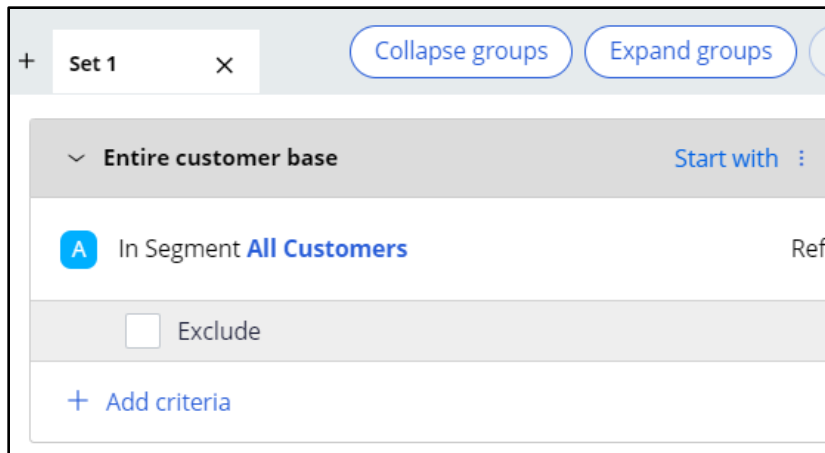
In this scenario, the bank wants to consider all customers in the customer base, then select the customers who have opted in to receive promotional emails. The bank has already created the **All Customers segment**, which contains the list of all customers. You can reference this segment in the first criterion.



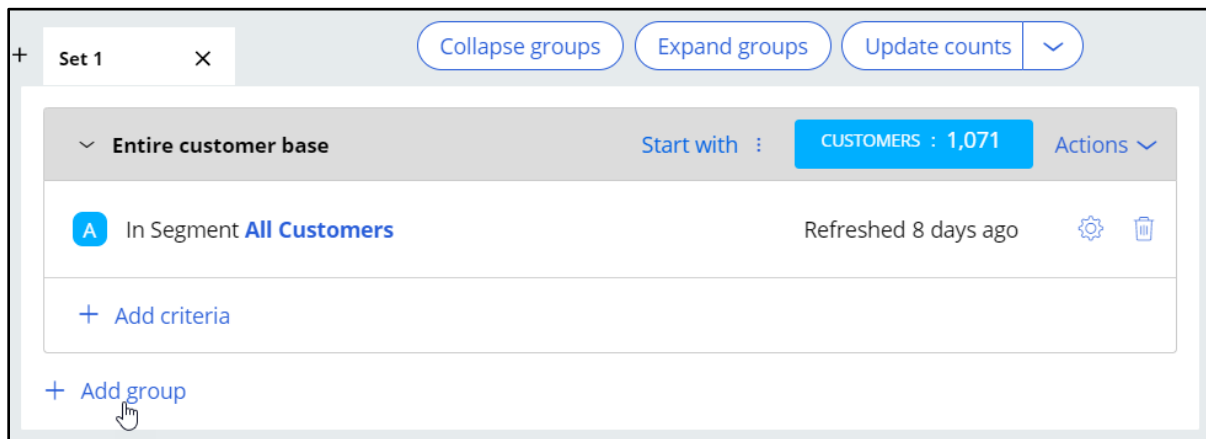
In the **Add Criteria** window, the **Segments** tab lists all available segments. Select the existing **All Customers** segment.



The **All Customers** segment is added as the first segment criterion. The **Exclude** option allows you to exclude the result of a criterion.



The next step is to add another criterion to identify customers who have opted in to receive promotional emails. You can add the new criterion in the existing criteria group or in a new group.



In the **Add Criteria** window, the **Data Fields** tab lists all available customer properties. You can either select the field directly or search for it by entering the partial name in the search field. Then, select the desired field from the search results. In this system, the field **EmailOptIn** contains the information about whether a customer has opted in to receive emails or not.

Add Criteria

Data fields

History fields

Segments

EmailOptIn

Customer

→ History

Name ▲

Customer.EmailOptIn

Once the field is selected, you can configure it to meet the business requirement. In this system, the value **Y** indicates that the customer has opted in, and **N** indicates that he/she has not opted in to receive promotional emails.

The screenshot shows a user interface for building a customer segment. At the top, there's a tab labeled 'Set 1' with a close button. Below it are buttons for 'Collapse groups', 'Expand groups', 'Update counts', and a 'Save to enable' button. The main area contains two criteria groups:

- Entire customer base**: This group is set to 'Start with' and uses the 'CUSTOMERS' data source. It contains a single criterion 'A' labeled 'In Segment All Customers', which was 'Refreshed 1 month 13 days ago'. There is an 'Exclude' checkbox and an 'Add criteria' button.
- All mailable customers**: This group is set to 'Intersect' and also uses the 'CUSTOMERS' data source. It contains a criterion 'A' labeled 'EmailOptIn Not yet configured'. The criteria configuration shows 'Exactly' selected from a dropdown, with a text input containing 'Y'. Below this are three checkboxes: 'Exclude' (unchecked), 'Include missing values' (unchecked), and 'Ignore case' (unchecked). There is an 'Add criteria' button.

At the bottom left, there is an 'Add group' button.

The **Include missing values** option is used to include results that do not have a value specified for the selected field.

The **Ignore case** option is used to perform a case-insensitive search. You can leave both options unselected for this scenario.

The **Update Counts** option is used to update the population count of the segment while you are building it.

Note: The **Update Counts** option is enabled when you save the segment.

You can combine the result of a criteria group with the result from the criteria group above it using one of the three options:

Intersect selects the customers the two results have in common.

Exclude excludes the result of the current criteria group from the result above it.

Merge combines the results of both criteria groups.

Save and run the segment

When you are done defining all the segment criteria, you can save and run the segment. Click **Run** to run the segment.

While the segment is running, you can stop the execution by clicking the **Stop** button.

Once the run completes, the number of customers in the resulting segment is displayed as **Population count**.

Design
Options and Schedule
Paid sync
History

Population count: **769** of **1,071**
[Show Customers](#)

More ▾

+ Set 1 ×
Collapse groups
Expand groups
Update counts ▾

▾ Entire customer base
Start with : CUSTOMERS : 1,071

A In Segment **All Customers** Refreshed 16 days ago

▾ All mailable customers
Intersect : CUSTOMERS : 769

A EmailOptIn exactly 'Y'

There are **1071** customers in the **All Customers** Segment, out of which **769** customers have opted in to receive promotional emails.

Click the **Show Customers** link to preview the list of customers selected for this segment.

Population count: **769** of **1,071**
[Show Customers](#)

The list is shown in a separate window.

CustomerID* ↑	ACCOUNT ID	Title	Full Name	Gender	Age	Language	MaritalStatus
14			Troy Murphy	M	26		Married
15			Barbara Stockton	F	32		Single
16			Joanna Williams	F	25		Married
17			Robert Walton	M	26		Single
18			John Smith	M	45		Single
19			Arnold Green	M	56		Single
CON-1			Layne McLaughlin	F	19		Single
CON-10			Ezekiel Funk	M	32		Single

Key segment configurations

On the **Options and Schedule** tab, there are two key settings under **Data Options** that control how data in the segment is refreshed at run-time and what level of control a segment can exert over other segments.

Design
Options and Schedule
Paid sync
History

Data Options

☐ Enable Transactional Refresh
Select this option for segments that are used for exclusion lists or transactional notifications to customers.

☐ Refreshable Segment
Refreshable segments allow other segments to automatically refresh them.

☐ Refresh Child Segments
Selecting this option will enable this segment to refresh other, refreshable segments.

Sampled Segment Options

☐ Select a portion (sample) of criteria results

When the **Refreshable Segment** option is enabled, the segment will be refreshed when the other segments that reference it are run.

The **Refresh Child Segments** option allows you to control the cascading effect of the refresh operation. The segment can automatically refresh data in its child segments, if they are marked as refreshable.

The **Sampled Segment Options** allows you to select a random sample of a segment result to be selected as the final segment result.

Segment run history

On the **History** tab, you can view the details of previous execution runs. The history lists the runs triggered manually by a user, indicated by **Populate Segment Requested by: <user name>**. It also lists runs triggered by the outbound schedule in Next-Best-Action Designer, indicated by **Populate Segment Requested by: Program run**.

Design	Options and Schedule	Paid sync	History
Current run			
This segment is not currently running.			
Completed runs			
Run status	Information	Last run ↓	Count
COMPLETED	Populate Segment Requested by: Program Run	03/27/20 05:37 AM	769
COMPLETED	Populate Segment Requested by: CDH Analyst	03/27/20 05:20 AM	769

Defining an action for outbound

Creating an email treatment

You can send offer emails to qualified customers in an always-on outbound environment using email treatments. An email treatment helps to design a visually appealing email message for customers.

Transcript

This demo shows you how to create an email treatment to present offer details in an email.

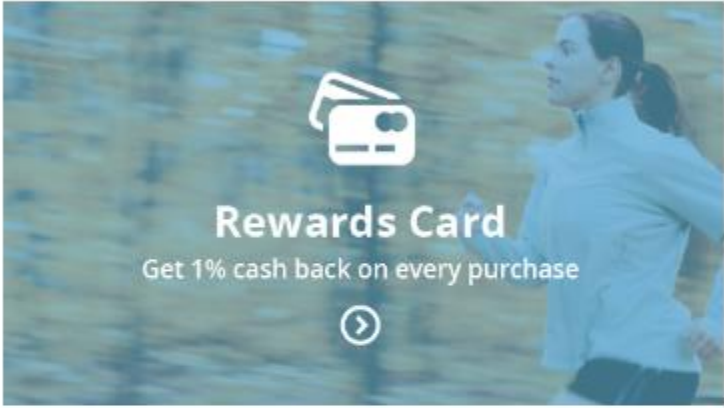
U+, a retail bank, wants to promote their Rewards credit card via email. They want to send the email to qualified customers in an always-on outbound environment.

The email is personalized and contains the offer details and a call to action. When customers click the **APPLY TODAY** call to action in the email, they are directed to the credit cards page on the bank's website to learn more about the offer and apply for it if interested.

Enjoy cashback on every purchase!

U+ Bank

Get 1% cashback on every purchase



Rewards Card

Get 1% cash back on every purchase

Dear Stephen Gold

You are pre-approved for a **U+ Bank Rewards card**.

Here's an overview of the card benefits:

- \$200 cash rewards after you spend \$500 on purchases in the first 3 months from account opening.
- 1% cash back on every purchase.
- No annual fee.

Click the following link to know more.

APPLY TODAY →

U+ Bank
One Rogers Street, Cambridge, MA, 02142-1209, U.S.A.

This is Pega Customer Decision Hub™ portal. To send emails in an always-on outbound environment, you need to add an email treatment to every action that you want to promote through email. An email treatment contains the message that you want to communicate to customers.

In this case, you create and add an email treatment to the Rewards card. Open the Rewards card to add new treatments to the **action**.


You can manage treatments associated with an action on the **Treatments** tab. To associate a treatment with an action, click **Add channel**.

Edit Offer: Rewards card [Available]
 Sales • CreditCards • RewardsCard PegaCRM-Artifacts:01-01-01


Details **Engagement policy** **Treatments** **Flow** **Test**

Default content URL ?

Web


>  **Rewards card tile**
 Rewards card tile


Add channel ▾

- Agent assisted
- Email 
- Mobile

You can use an existing email treatment or create a new one. In this case, you want to create a new treatment.

Configure Email Treatment

Search... 

[+ Create](#) 

Premier Rewards card email PremierRewardsCardEmail	Add
Rewards Plus card email RewardsPlusCardEmail	Add
Standard card email StandardCardEmail	Add
Template email for sending a bundle of offe... BundleTemplate	Add

Now, enter an appropriate **short description** to create the new treatment. It is a best practice to create the treatment in the same issue/group hierarchy in which you plan to use it; this will make the treatment easier to access and manage.

Create Email Treatment

Create and open

Cancel

Email Treatment Record Configuration

Rewards Card Email

A short description or title for this record

Identifier

RewardsCardEmail [Edit](#)

Categorization

Issue

Group

Sales

CreditCards

Then, enter the email content.

Edit Email Treatment: RewardsCardEmail [Available]

Sales • CreditCards • RewardsCardEmail • Email [PegaCRM-Artifacts:01-01-01](#)

Treatment

Test Message

Prompts

Pages & Classes

Security

History

Subject

Key Code

☒ Track Email Open Rate

Edit mode

Pick email template

Load template from file

View

Desk

Logo

Title

600 x 100

Section content

Footer links

First, enter the email subject. You can include both static text and dynamic placeholders in the subject.

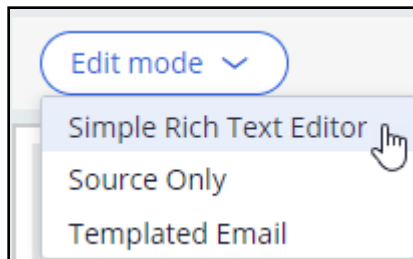
To access dynamic placeholders, start typing dot followed by Customer to access customer properties or OfferData to access action properties.

Dynamic placeholders allow you to personalize the subject. You can construct the placeholders with both customer and offer attribute properties.

At runtime, the properties are replaced with the real values. For example, if the customer's first name is *Stephen*, the generated subject line reads: *Hi Stephen, here's your U+ Bank card*.

Then, enter an appropriate keycode. When the **Track Email Open Rate** option is enabled, the system records an impression when a customer opens an email.

You can design the email using one of the three edit modes: Simple Rich Text Editor, Source Only, and Templated Email.

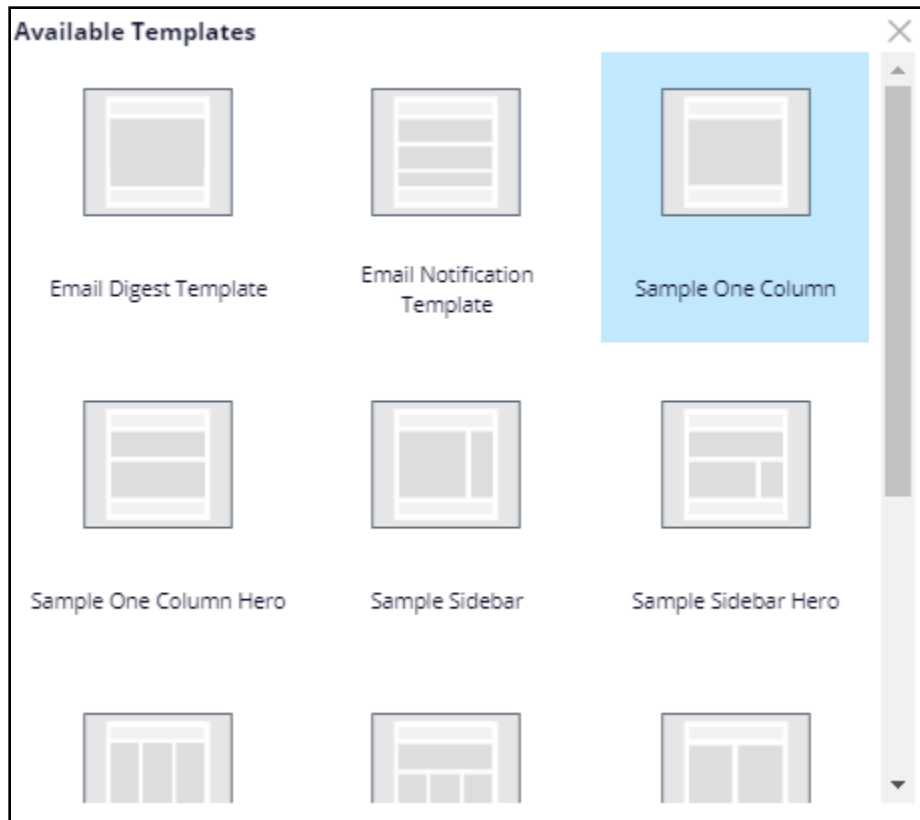


The **Simple Rich Text Editor** provides a blank page with a rich text editor, which allows you to compose an email manually.

The **Source Only** mode allows you to work with HTML content only. If the content is designed in an external tool, you can copy and paste the HTML content in this mode.

The **Templated Email** mode provides you with several easy-to-use templates for designing appealing emails; this is also the default mode.

These are the available template options.



In this case, you use the default **Simple One Column** template.

The **Simple One Column** template contains four sections: Preheader, Header, Body, and Footer.



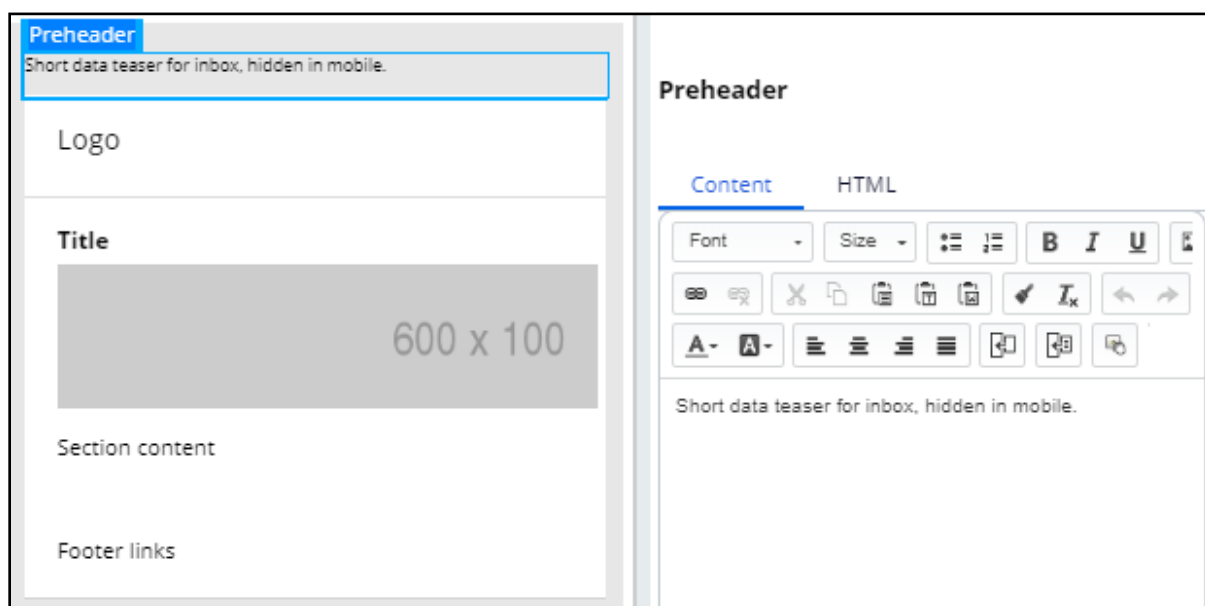
The Preheader section can contain a short **data teaser for inbox** that is intended to persuade customers to read the email further. This text is hidden on a mobile device.

The Header section can contain the organization's logo.

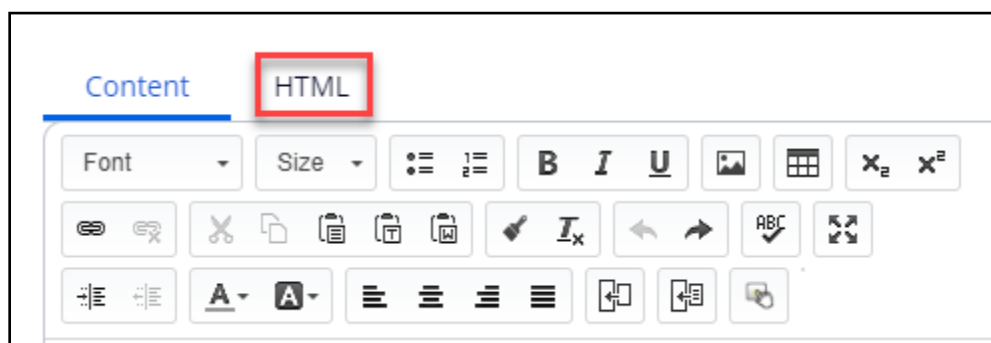
The Body section contains a placeholder for a title, image, text, or buttons as required. This section is where the main content goes.

The Footer section can contain contact details or links, if any.

When you click on the different placeholders or sections in the template, an editing pane is displayed on the right side of the screen.



This editor also allows you to copy and paste HTML content from other tools using the **HTML** tab.

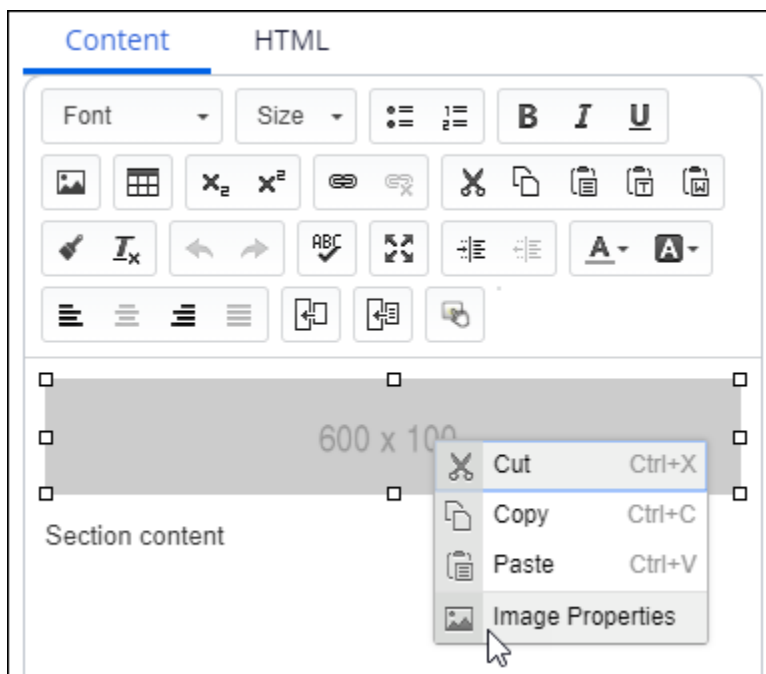


While composing the section, you can see the preview on the left.

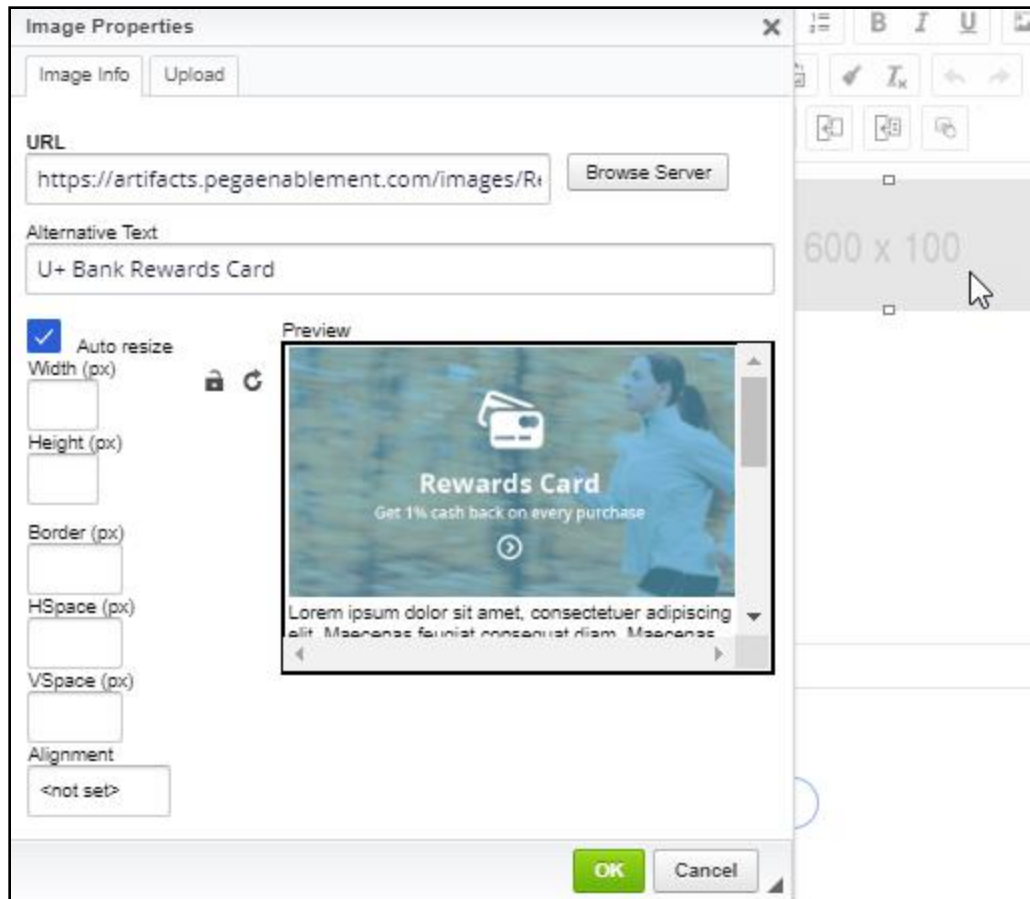


You can also add a title to the email.

To add an image, you can open the image placeholder, which opens the **Image Properties**.



In the **Image Properties**, you can reference an image from a content server.



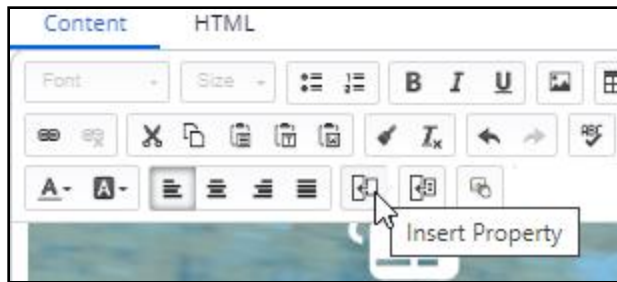
It is best practice to host an image on an external server and reference it in the email. Do not embed images directly in the email, as it makes the email bulky.

In the email content, you can add static content and dynamic placeholders to personalize the message.

For example, the property **.Customer.pyFirstName** can be added as a placeholder. The customer's real first name will replace the placeholder at the time of email delivery.

Dear <<.Customer.pyFullName>>

To add a customer or offer attribute as a dynamic placeholder, use the **Insert Property** button.



 A screenshot of the 'Property Parameters' dialog box. It contains three input fields: 'Name' with the value '.Customer.pyFullName', 'Format' (empty), and 'When' (empty). Each field has a gear icon to its right. At the bottom, there are 'Cancel' and 'Save' buttons.

Any property that you add in an email treatment has an equivalent Pega markup tag (**pega:reference**) to reference customer or offer attributes. After you insert the property, you can view the tag (which is automatically added) in the **HTML** tab. When you design the email in an external application, you can use these tags to add dynamic placeholders, so the personalization works when you import the HTML into the email treatment.

 A screenshot of the 'HTML' tab in the email editor. It shows the generated HTML code for the email content. The code includes an image tag, a paragraph tag with a Pega reference, and a strong tag. The Pega reference is highlighted with a red box: `<p>Dear <pega:reference name=".Customer.pyFullName"></pega:reference>
`.

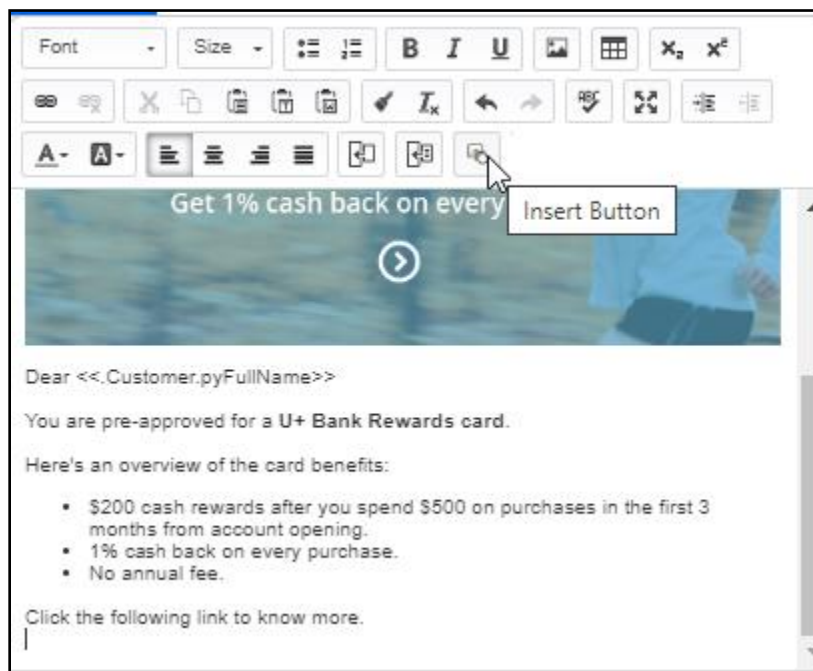

```

1 
2 <p>Dear <pega:reference name=".Customer.pyFullName"></pega:reference>&nbsp;<br />
3 <br />
4 You are pre-approved for a <strong>U+ Bank Rewards &nbsp;<br />
  
```

Note that to add an offer attribute, you can add a dynamic placeholder, which is then replaced with the offer attribute at the time of email delivery. For example, you can use `<<.OfferData.ActionName>>` to reference the offer attribute.

In this case, you may want to replace U+ Bank card names with an offer attribute by using the `<<.OfferData.ActionName>>` placeholder.

You can also add links or buttons that the customer can click to respond to an offer or view more details. In this case, you add an **APPLY TODAY** call to action button.



In the **Button Parameters**, the **Function** drop-down menu lists the possible functions that you can assign to a button.

Button Parameters

✕

Function

Accept action

✓

Redirect to

☒ Response screen

☐ External URL

Response screen

DefaultEmailResponse

⚙

☒ Track click rate

Style options

Button text

Accepted

Button image URL

Custom style

Cancel

Save

Now, select **Open external URL** and provide an external URL that opens when the customer clicks the button. Then, provide the button image URL.

Button Parameters✕

Function

Open external URL

URL

https://pegasystems.github.io/uplus-wss/retail_bank/cate

☐ Include action data

☒ Track click rate

Style options

Button text

Button image URL

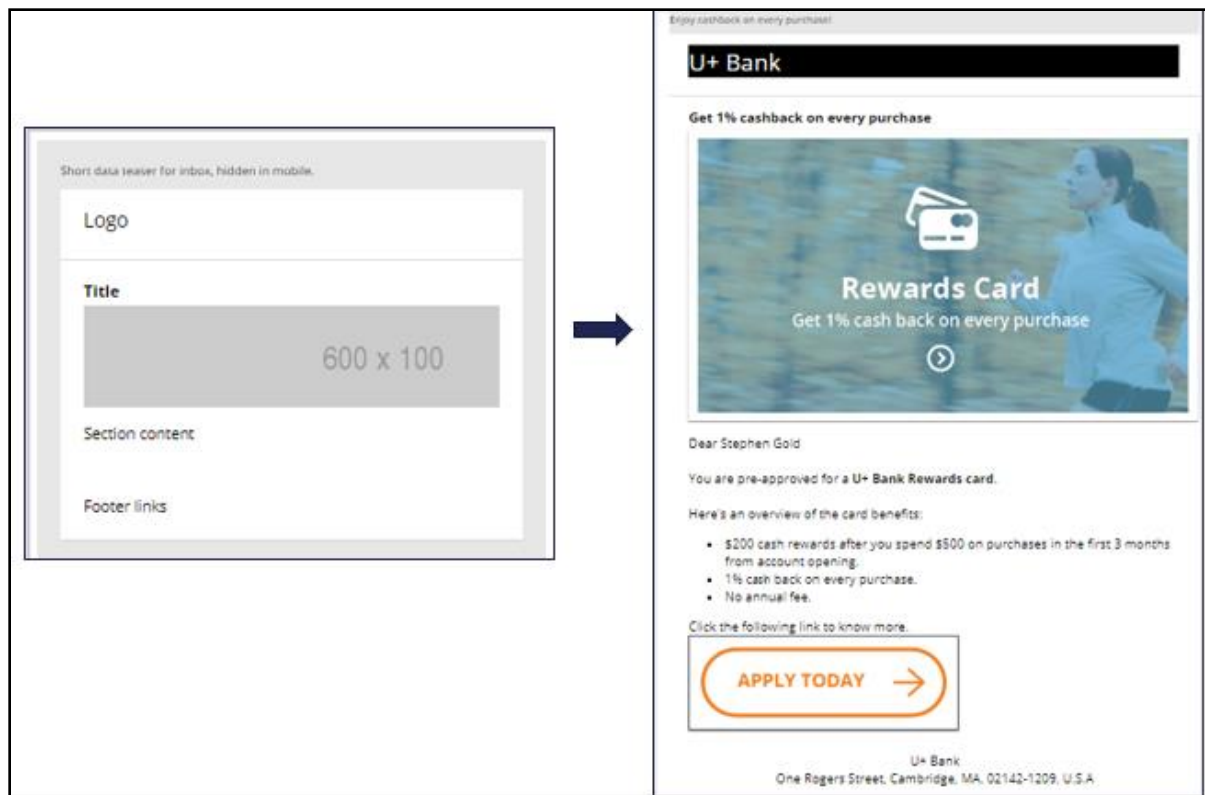
https://artifacts.pegaenablement.com/images/em:

Custom style

Cancel

Save

A composed email looks like this.



Now, save the treatment and add it to the Rewards card action.

You can send the email to test accounts or to yourself to test the visualization and rendering of the content on various email clients.


To test the treatment, switch to the **Test Message** tab. In this tab, you can specify the target email addresses and the email subject specifically for the test.

Send out a test message to check your formatting. [Send Test Message](#)

Test Email Details

To:



☒ Test Recipients ☐ Seed List




+

Test Email Subject

Subject

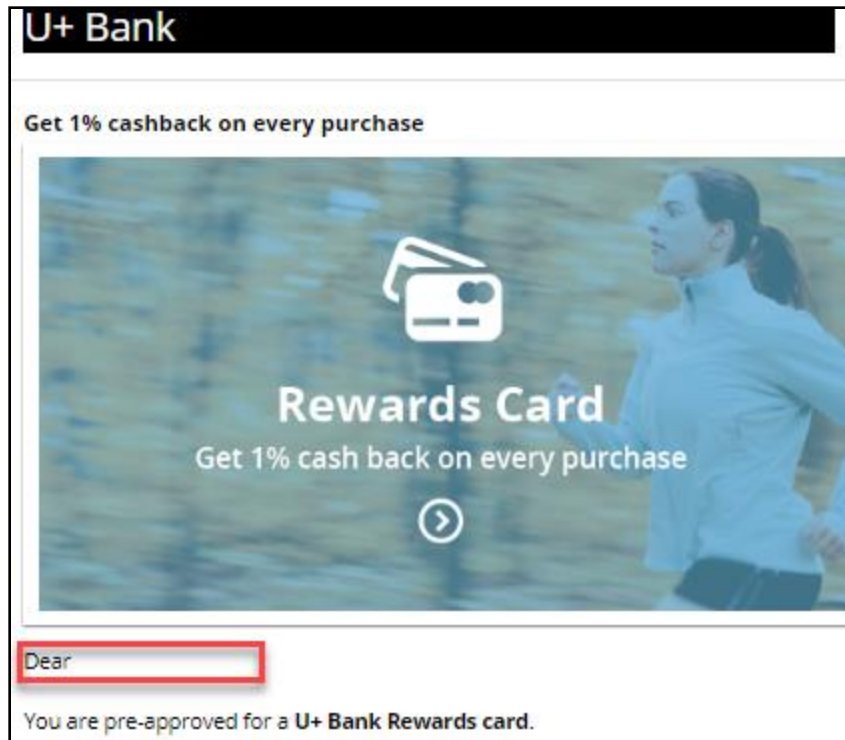
To test the treatment, click **Send Test Message**. Once the test is complete, you can check the emails in the email client.

Test Message - Results 

All messages sent successfully!

[Close](#)

Note that none of the attribute placeholders are populated when you manually enter the recipients' email address. However, you can test the functionality of the buttons and links.



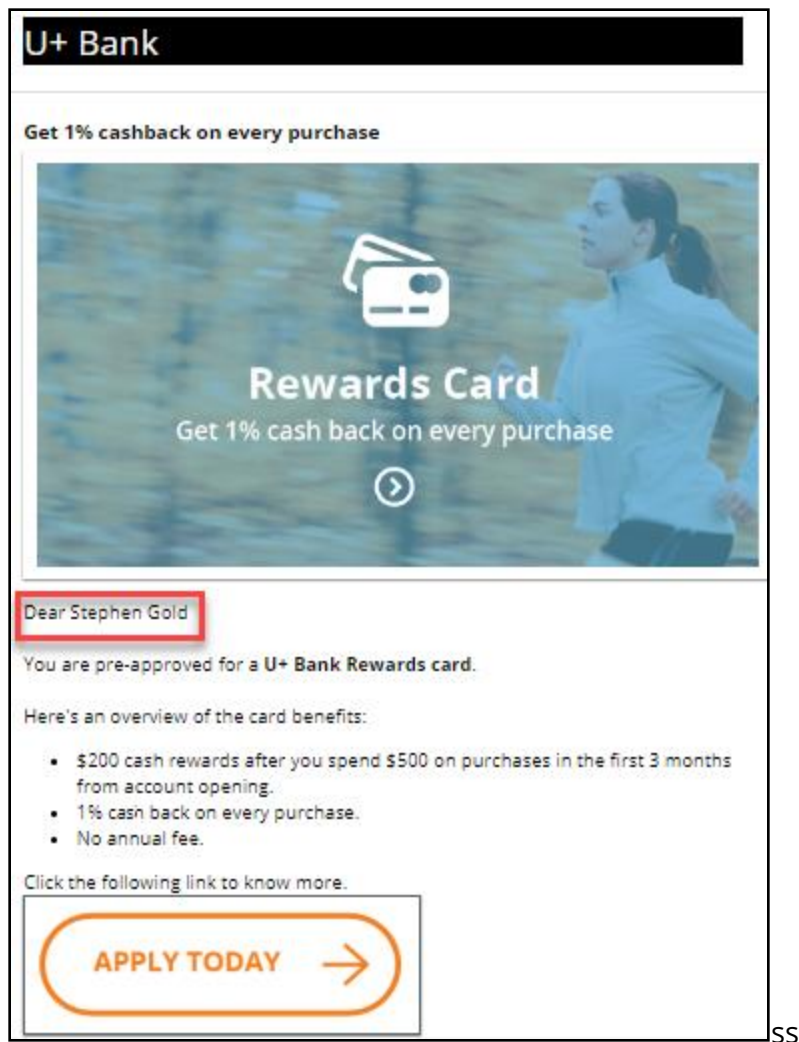
To populate the attribute placeholders, you can use a **seed list** as test input.

A screenshot of a web form titled "Test Email Details". It has two main sections. The first section, "To:", contains two radio buttons: "Test Recipients" (unselected) and "Seed List" (selected). Below this is a "Seed List:" label followed by a dropdown menu showing "StephenGold" and a "View all" link. The second section, "Test Email Subject", has a "Subject:" label followed by a text input field containing the value "This is a test message".

A seed list contains test customer data. It contains values for customer attributes, including email addresses.

When using a seed list to test the Treatment, the dynamic placeholders are replaced with customer information from the seed list.

Note that the customer name placeholder is replaced with the data from the seed list.



SS

This demo has concluded. What did it show you?

- How to add an email treatment to an action
- How to use dynamic placeholders to populate the customer and offer attributes in an email treatment
- How to use HTML code to generate content in an email treatment
- How to use an image from an external server in an email treatment
- How to add a button to an email treatment
- How to send emails to test accounts to test the visualization and rendering of the email content
- How to use seed lists to test the dynamic placeholders

Defining the action flow

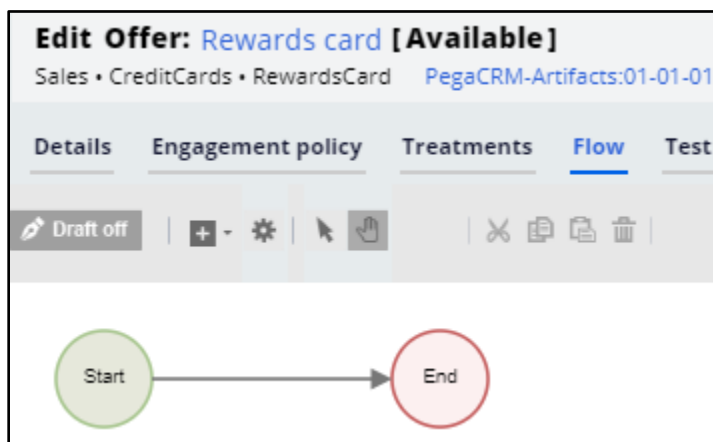
Business scenario

U+, a retail bank, has designed a new email treatment to promote the Rewards Card offer. Now, an action flow must be created to ensure that the email is delivered when this action is selected for a customer.

Action Flow

The action flow is a flow diagram that contains the sequence of steps carried out during the lifecycle of an action. These steps include delivering the action message via an outbound channel, waiting for a response, updating the Interaction History, sending a follow-up message, and so on. In a flow, each of these steps is represented by a variety of shapes. Best practice is to keep the flow short and simple, preferably not more than 2 or 3 steps per channel. Every additional step taken in the action flow is a missed opportunity to let the Pega brain decide the Next-Best-Action.

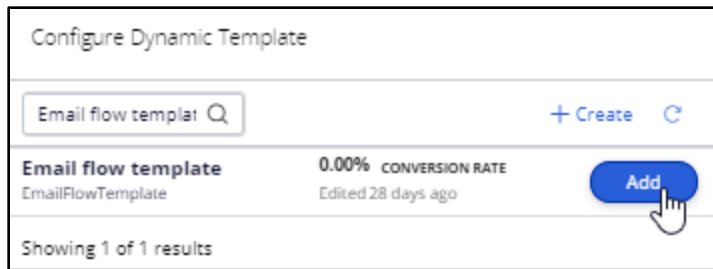
A new action contains only the default **Start** and **End** shapes. To send emails in an always-on outbound environment, you need to add a **Send Email** shape to the action flow.



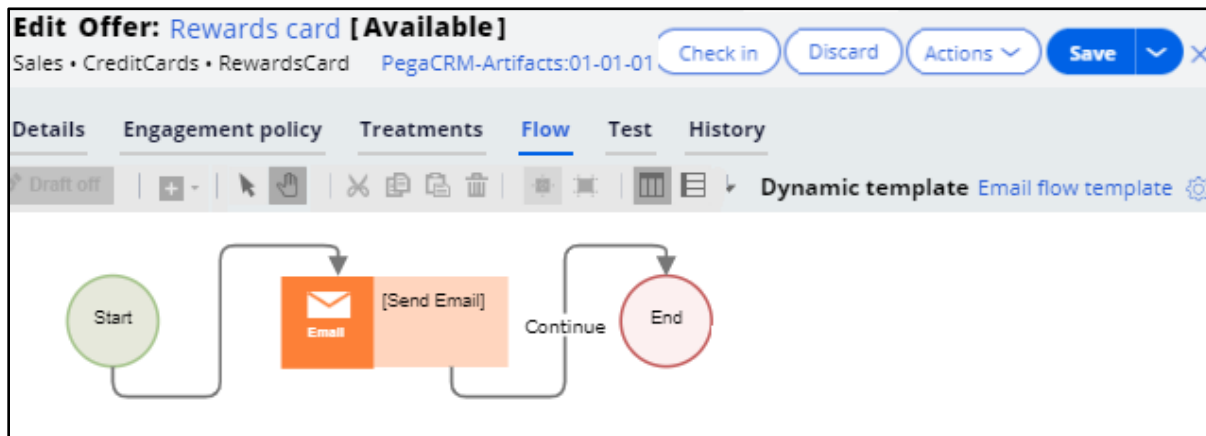
When there are several actions that need the same flow pattern, you can create that flow pattern once and reuse it for multiple actions using the **Dynamic template** option.



In the **Configure Dynamic Template** window, select the action that contains the desired flow pattern.



When you use the **Dynamic template** to configure the flow, you cannot change the flow in the referenced action. To edit the flow, you must edit the original action in which the flow was defined.



Basic email flow template

Let's look at a basic flow pattern for email delivery.

A flow template is just a normal action with the flow configured. In the following example, an action is used as a flow template within other actions to enable them to send emails. Thus, the **Availability** of the action is set to **Never** to prevent it from being presented to customers.

Offer: Email flow template [Available]
 Sales • CreditCards • EmailFlowTemplate [PegaCRM-Artifacts:01-01-01](#)

Details Engagement policy Treatments Flow Test History

Key code Variant

EMAILFLOWTEMPLATE

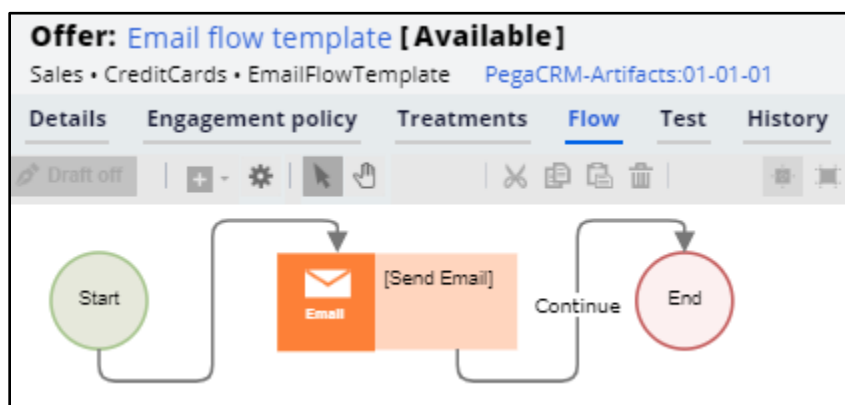
Availability

☐ Always

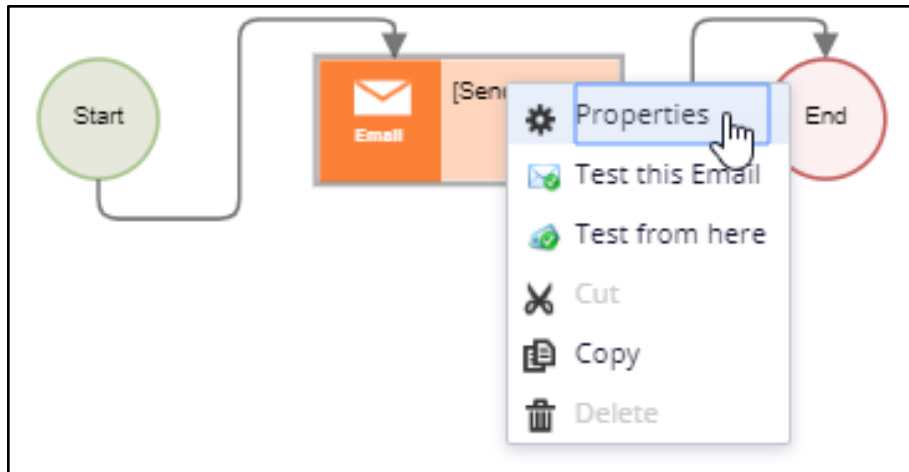
☒ Never

☐ Within a defined time period

The **Send Email** shape in the flow typically references the email treatment that contains the email content to be sent.



However, when you want the flow to be used as a template, you want the treatment belonging to the individual action to be used rather than a standard email treatment. In the **Send Email** shape, set the **Treatment** option to **Use treatment from strategy** to ensure that the treatment from each action, as selected by the Next-Best-Action decision, is used to send emails, instead of a standard treatment.



Send Email properties

Send Email: [Send Email]
Configure the content of the email and its delivery.

Treatment
What email treatment should be sent?

☐ Specify Treatment ☒ Use Treatment from Strategy ☐ Specify Property

Key Code

☒ Deliver Online

☒ Use Subject from Treatment ☐ Specify Subject

☐ Write To File
☐ Write to DB
☐ Wait after sending

This ensures that the email treatment is independent of the flow template associated with the action. For example, when the Rewards Card uses the **Email flow template** as its **Dynamic flow** template, the Rewards Card email treatment will be used for sending the email.

Avoiding overexposure of actions in outbound

Contact policy types

Types of constraints

Too many contact attempts over a short period of time can have a negative impact on a customer's attitude toward further actions by your company. To maximize the lifetime value of every customer relationship, organizations must prevent outreach fatigue by optimizing the number of actions taken.

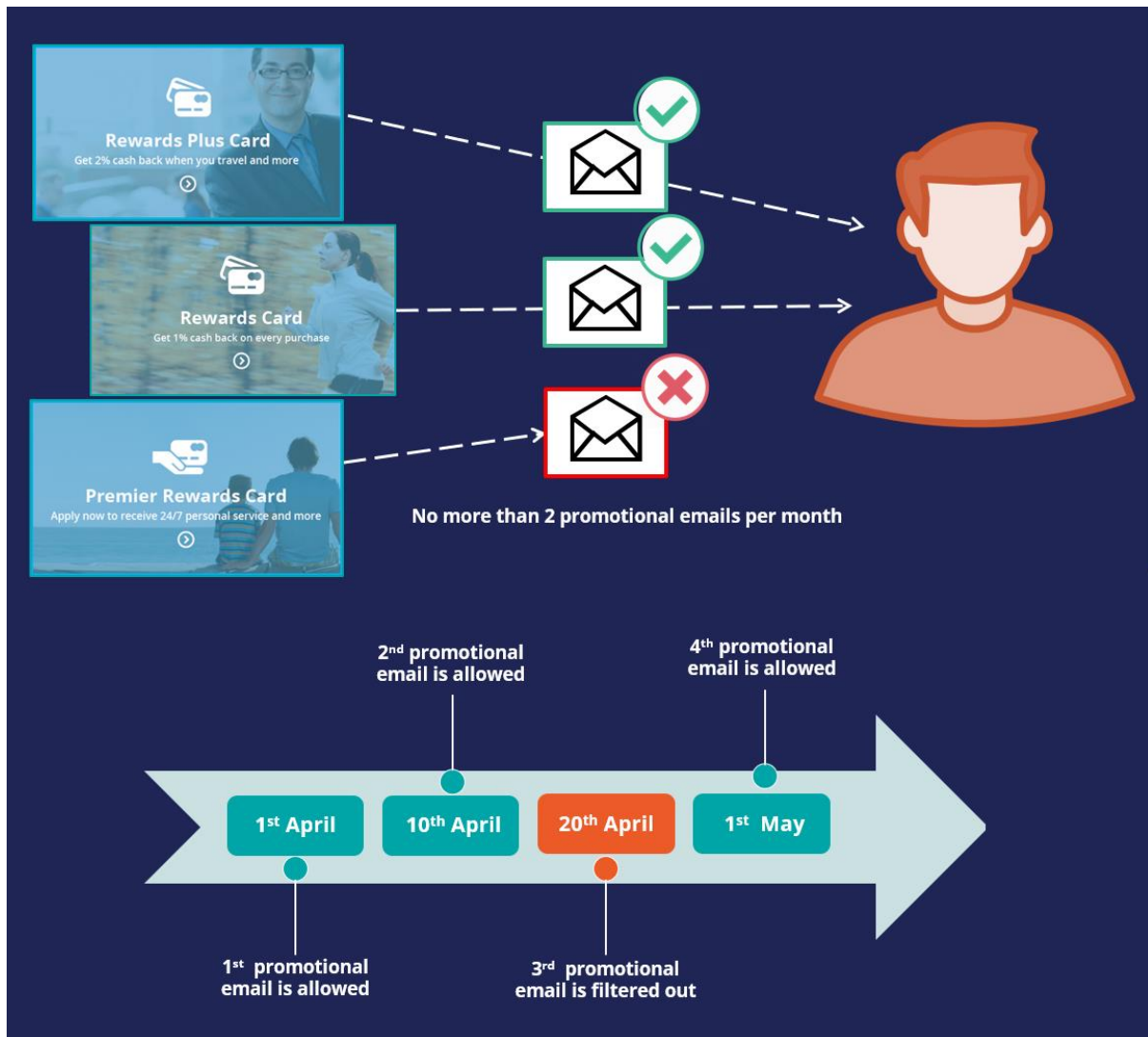
In Pega Customer Decision Hub™, there are two types of contact limits that allow you to limit actions over a given period of time.

1. Customer contact limits
2. Suppression policies

Customer contact limits

Customer contact limits allow you to limit the number of actions that a customer can receive over a given period of time on a specific channel. These customer contact limits prevent an action from reaching a customer on a specific channel, irrespective of past responses to that action by the customer.

For example, you can decide that you do not want your customers to receive more than two promotional emails per month.

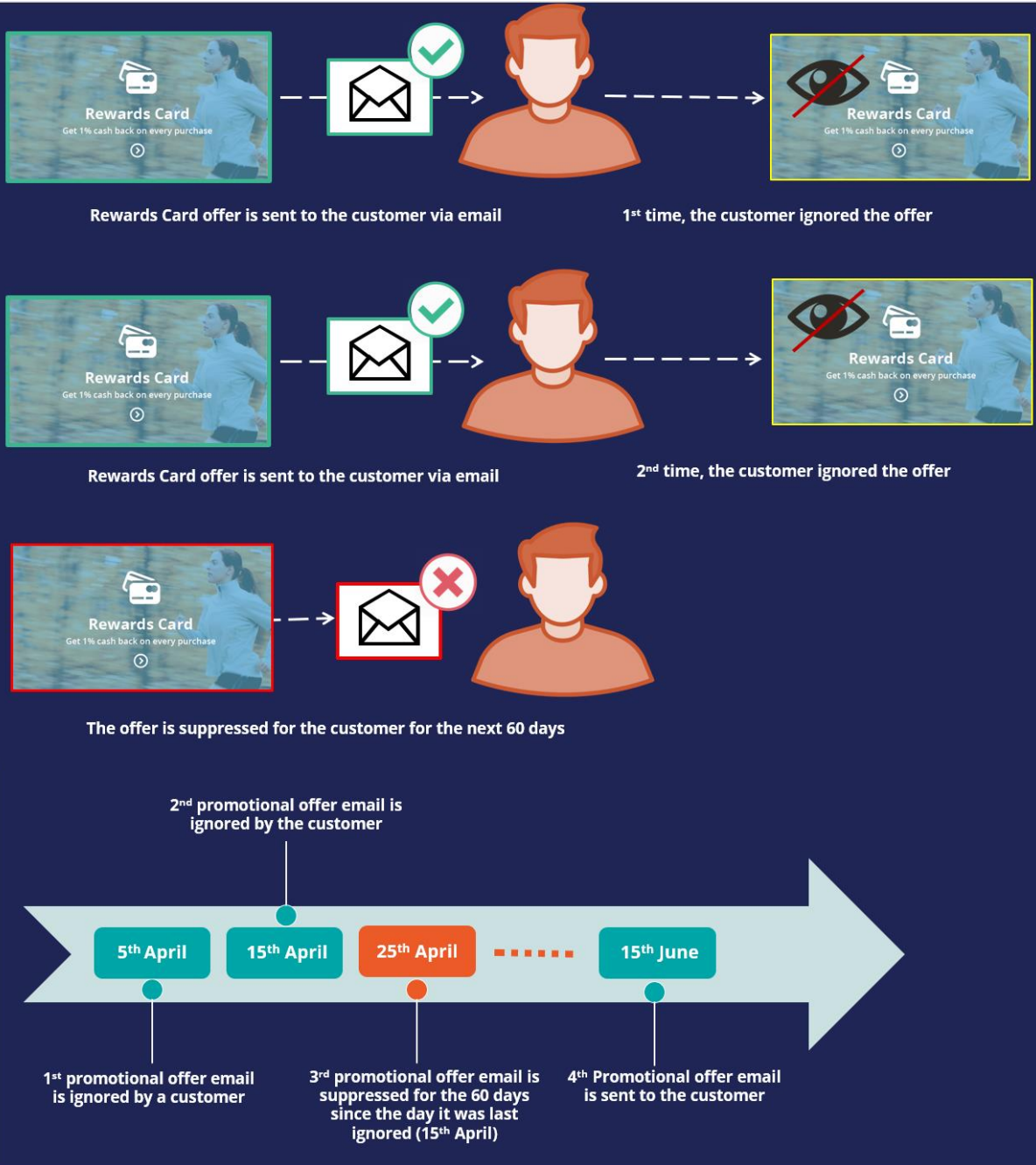


Suppression policies

Suppression policies determine when and for how long an action or group of actions should not be shown to a customer. These suppression policies put an action on hold after a specific number of outcomes are recorded for some or all channels.

Suppressing or pausing an action prevents oversaturation by limiting the number of times a customer is exposed to the same action.

For example, if a customer ignores a credit card promotional offer email twice in the previous 30 days, then the same credit card offer should not be sent to the customer again for the next 60 days.



Avoid sending the same action for a time period

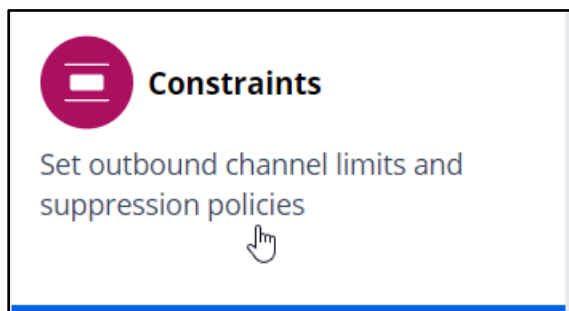
Business scenario

U+ Bank's marketing department currently promotes various credit card offers by sending emails to qualified customers.

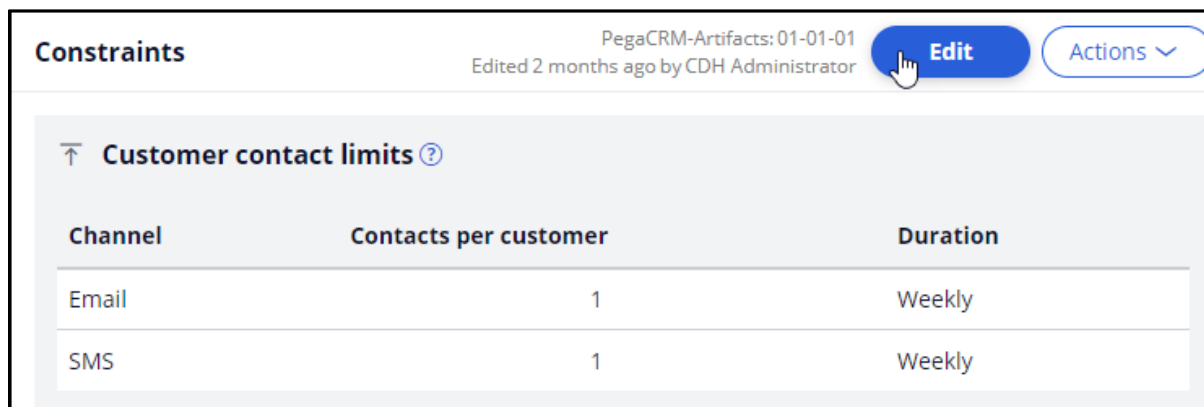
Now the bank wants to implement a new set of requirements: they want to limit the number of emails sent to their customers to two per month. Also, the bank wants to avoid sending a credit card offer via email for 60 days if one was sent in the past 30 days.

Updating constraints

On the Next-Best-Action Designer **Constraints** tab, you configure outbound channel limits and suppression policies.



Edit **Constraints** to modify the limits.

A screenshot of the "Constraints" configuration page. At the top, it says "PegaCRM-Artifacts: 01-01-01" and "Edited 2 months ago by CDH Administrator". There are "Edit" and "Actions" buttons. Below is a section titled "Customer contact limits" with a table showing limits for Email and SMS channels.

Channel	Contacts per customer	Duration
Email	1	Weekly
SMS	1	Weekly

Updating customer contact limits

To limit the number of outbound interactions that a customer can receive over a given period of time on a specific channel, you need to set customer contact limits.

Constraints

Save

Cancel

Actions

PegaCRM-Artifacts: 01-01-01

Edited less than a minute from now by CDH Analyst

↑

Customer contact limits

?

Channel	Contacts per customer	Duration
Email	1	Weekly
SMS	1	Weekly

Edit customer contact policy

In this scenario, the bank wants their customers to receive no more than two emails per month. So, you need to update the existing customer contact policy for the email channel to two emails per month.

Edit Contact Policy: Customer Contact Policy

[Available]

CL PegaCRM-Data-Customer

ID CustomerContactPolicy

RS PegaCRM-Artifacts:01-01-01

Check in

Discard

Actions

Save

General

History

Policy Starts:

4/2/2020

Policy Ends:

☒ Available

Please specify the maximum number of times a Subscriber can be contacted per channel.

Channel	Contact(s) per Subscriber	Duration	
Email	2	Monthly	⊖
SMS	1	Weekly	⊕

⊕

In the contact policy, you can update current limits or add new channel limits.

Note: You cannot repeat a channel in a contact policy.

Defining suppression policies

To suppress a single action or a group of actions for a limited time period, you need to define suppression policies.

In this scenario, the bank wants to avoid sending promotional emails related to a credit card offer for 60 days if one was sent in the past 30 days. So, you need to add a contact policy to put an action on hold for 60 days.



When an email is sent, a record is added to the Interaction History with the outcome value **Pending**.

Provide a name for the new contact policy and then select the type of outcome it will track; in this case it will track outcomes with the value **Pending**.

You can specify whether the responses are tracked for one specific action, or for all actions in the group. Track the responses at the action level, since you want to suppress only credit card promotions in email.

You can select the time period over which the responses should be tracked. In this case, responses should be tracked for the past 30 days.

Add contact policy ✕

Name *

Scope

Track for within the past days

The business requirement is to suppress the action for 60 days if an email was sent in the past 30 days. In other words, if there is even one pending response for the email treatment over the past 30-day period, the action must be suppressed. So, you need to enter the number of responses required to fulfill the suppression criteria as 1.

Then you need to select the channel for which the responses are tracked and enter the number of days for which an action should be paused when the suppression criteria are met.


▼ 30-day action pending: Track Pending for the action over the past 30 days ⋮

If there are Pending for treatments, suppress the action for days 🗑️

[+ Add suppression](#)


Associating a contact policy with an issue and a group

On the **Engagement policy** tab, you can associate contact policies with an issue and group. The contact policies are reusable across all issues and groups.



Engagement policy

Capture business rules which define when actions are appropriate



As the bank wants to suppress promotional emails related to credit card offers, you need to edit the **CreditCards** group to add the newly defined contact policy to it.

Business structure

⚡ All groups

Sales

CreditCards

Sales / CreditCards

PegaCRM-Artifacts: 01-01-01
Edited 4 minutes ago by CDH Analyst

EditDeleteActions

Engagement policy

E Eligibility

(isCustomer is true)
and (Age is greater than 18)

A Applicability

(Has Cards is equal to N)

S Suitability

No group criteria defined

C Contact policy

> 7-day action impressions: Track Impressions for the action over the past 7 days

> 7-day group clicks: Track Clicks for all actions in the group over the past 7 days

< 30-day action pending: Track Pending for the action over the past 30 days
If there are 1 Pending for Email treatments, suppress the action for 60 days

74

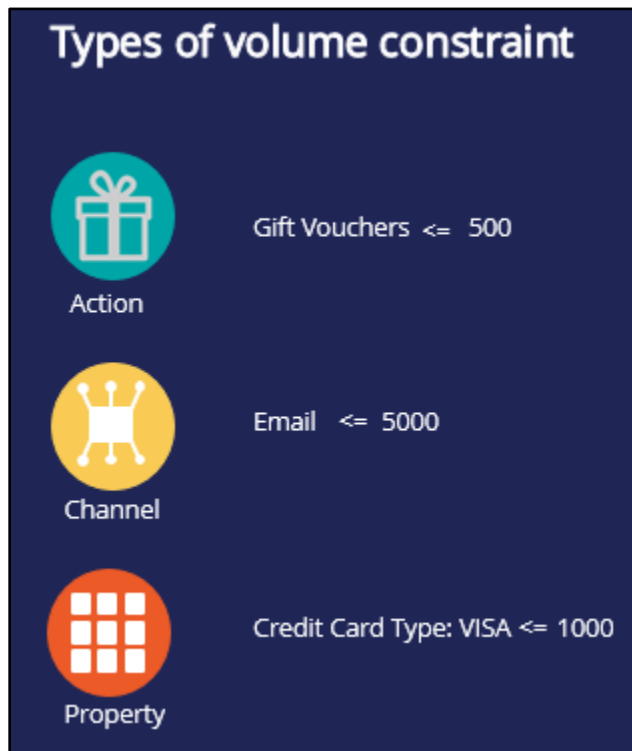
Limiting action volume on outbound

Volume constraints

What is volume constraint?

In Pega Customer Decision Hub™ you can limit the volume of actions delivered to customers via always-on outbound.

Volume constraints can be set at an action, channel, and/or property level.



Action constraint: It limits the volume of actions that can be sent to customers.

An action constraint is useful in a situation where you have a limited number of offers that you can send to customers, for example, 500 gift vouchers. Configuring an action constraint would ensure that you do not offer more offers than are available.

Channel constraint: It limits the volume of actions that can be delivered via a certain channel.

You can use channel constraint for channel capacity planning. For example, assume that you have a limited call handling capacity in your inbound call center, for example 1000 calls/day. When you send 50,000 emails on a day on a certain regulatory update, let's say you expect 2%-3% follow-up calls a day from your customers to your contact center, which is about 1000-1500 calls. So, you need to limit the outbound email volume to 35,000 emails a day to match the inbound call center capacity.

Property constraint: By default, actions are grouped under the issue / group business hierarchy. Using a property constraint, you can limit the volume of a set of actions across different issues and groups by grouping them using a property value.

For example, you can group all credit card offers by setting a property, CreditCardType, to VISA. Then you can define a constraint to limit the action volume where CreditCardType is VISA.

Volume constraint modes

Within a volume constraint, the combination of constraints can be defined for one or more actions with one or more channel types.

In situations where a customer is eligible for multiple actions, volume constraint can be applied in two different ways depending on the business requirement. That is, you may specify whether volume constraints should be applied to the actions as a group, or whether each action should be evaluated separately.

When volume constraint is evaluated separately, each action is checked for the customer separately against applicable channel and action constraints. A customer receives only one action, the one with the top priority, even though the limits for the other low priority actions, are not reached. The top action is selected based on factors like propensity, action value and business levers defined in Next-Best-Action Designer Arbitration.



For example, let's consider that a customer is eligible for Standard card, Rewards card, and Rewards Plus card credit card actions and Standard card is the top priority card. Also, assume that the remaining volume for all three actions are above zero. When you set volume constraints to check each action, the customer will be presented only with the top priority action, Standard card.

When volume constraint is applied for actions as a group, the highest priority action is selected to apply constraints on the channels and actions, without removing the other actions for a customer. That is, a customer receives all the actions he/she qualifies for, provided that the limit for the top priority action is not reached. The other low priority actions are selected even though the limits for those actions are reached.



For example, let's consider that a customer is eligible for Standard card, Rewards card, and Rewards Plus card actions and Standard card is the top priority action. Also, the remaining volume for Standard card is above zero, but for the other two actions it has reached zero. When you set volume constraints to check actions as a group, the customer receives all the actions.

Evaluating actions as a group allows Pega Customer Decision Hub to present all eligible actions to a customer.

Configuring a volume constraint

Business scenario

U+ bank has been running always-on outbound and now they would like to apply some limitations on the outbound volume. They have the following three different kinds of operational constraints to implement.

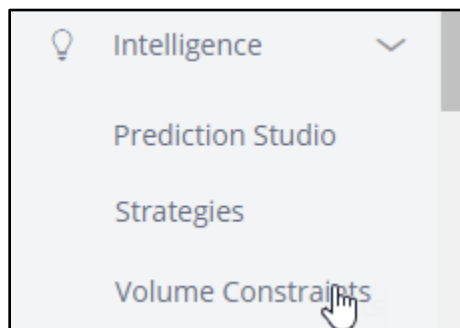
- The IT department has enforced a limit of 1000 emails per week to avoid being classified as spammers. Hence, the marketing team wants to adhere to the limits.
- The bank would like to restrict the number of Standard card offer emails to only 100 per week due to a business requirement.
- The bank would also like to limit offer emails related to credit cards of type “Master” to only 400 per week due to a logistical issue with their fulfillment vendor.

Creating a volume constraint

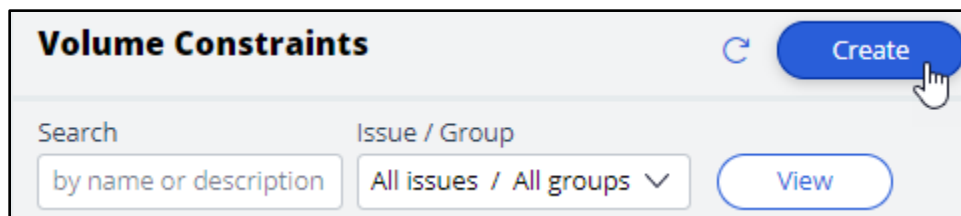
A constraint is an optional configuration element of always-on outbound. When configured, it will limit the volume of actions that will ultimately be initiated.

To limit action volume on the email channel, you need to configure a volume constraint for the always-on outbound.

The volume constraint landing page can be accessed from **Intelligence** -> **Volume Constraints** from the navigation menu.



You can add a new volume constraint from this page.



Provide a short description for the new volume constraint and the identifier is automatically populated when you tab out.

Note: The volume constraint must be created at the top level for it to be used in the Next-Best-Action Designer outbound schedule.

Create Volume Constraint

Create and open

Volume Constraint Record Configuration

Limit Offers

A short description or title for this record

Identifier
LimitOffers [Edit](#)

Categorization

Issue

Select Issue ▼

Group

Select Group ▼

Configuring a volume constraint

The **General** tab is where you configure the different types of volume constraints.

Top Level • LimitOffers PegaCRM-Artifacts:01-01-01

Edit Volume Constraint: Limit Offers [Available]

Actions ▾ Save ▾ X

General History

How should multiple actions for a customer be treated?

☐ ?


☒ Individually for each action

☐ As a group for the customer (output all actions)

Reset constraint counts

☒ Individually


☐ All at once



Constraint definitions have not been added.

[Add definition](#)

In this scenario the bank wants to implement three types of volume constraints. As a first step, add a channel constraint that limits the number of outbound messages to 1000/week on the email channel.

▼ **Maximum 1.0K Weekly with Channel: Email** 1,000 remaining  ⋮

Minimum volume

Maximum volume

Reset interval

▾

Channel

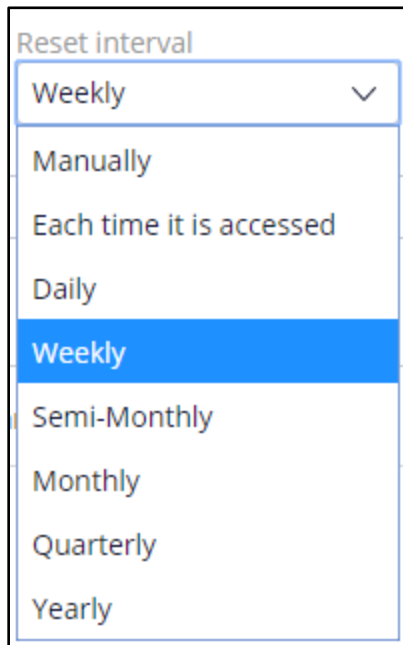
▾

Action

▾

[+ Add Property](#)

The **Reset interval** option determines how frequently the volume limit is reset to the full quota. There are a number of reset interval options available, including: *Manually*, which will allow you to reset the constraint limits manually using the **Reset** button.



The other options in this list can be used when you want the system to automatically reset the constraint. For example, *Weekly* means that the system will reset the limits the first time they are applied in a particular week, Sunday being considered the first day of the week.

The remaining quota of the volume constraints, if any, in a given reset interval will be used in the following scheduled run. For example, if only 300 Rewards card emails can be sent in a week, the scheduled run might send 250 emails based on action prioritization. The remaining 50 emails will be sent in the same week during the next scheduled run.

In this case, configure the **Reset interval** as *Weekly* for both channel and action constraints.

Next, add an action constraint that will restrict the Standard card offer emails to only 100 per week.

> **Maximum 1.0K Weekly with Channel: Email** 1,000 remaining ☒ ⋮

< **Maximum 100 Weekly with Channel: Email, Action: StandardCard** ☒ ⋮

Minimum volume

Maximum volume

Reset interval

Weekly ▾

Channel

Email ▾

Action

StandardCard ▾

+ Add Property

Finally, as per the requirements, add a property constraint that will limit offer emails related to credit cards of type “Master” to only 400 per week.

> **Maximum 1.0K Weekly with Channel: Email** 1,000 remaining ☒ ⋮

> **Maximum 100 Weekly with Channel: Email, Action: StandardCard** ☒ ⋮

< **[Undefined Volume]** Unlimited ☒ ⋮

Minimum volume

Maximum volume

Reset interval

Weekly ▾

Channel

Email ▾

Action

Select action ▾

Type

▾

Master










Configuring volume constraint in the Next-Best-Action Designer

To implement this business requirement, you need to configure the Next-Best-Action Designer to perform always-on outbound customer engagement with the volume constraint configured.

On the **Channels** tab, configure the **Primary Schedule** to achieve this.

 Primary schedule  <small>Schedule cannot be run. Confirm start date is not in the past, and starting population is selected.</small> 		
Recurrence  	Starting population  	Volume constraint (optional)  
Not yet configured	Not yet configured	Not yet configured

The schedule has two mandatory configurations, **Recurrence** and **Starting population**. To include the volume limits on outbound, you must configure the **Volume constraint**.

 Primary schedule  DRAFT		
Recurrence  	Starting population  	Volume constraint (optional)  
Daily Start on 4/2/20 1:33 PM No end date Refresh the audience for each scheduled occurrence	 All mailable customers	Limit Offers

With that, all the necessary configurations for this scenario are complete.

Run the schedule. Once the primary schedule has run, you can check the remaining volume limits for the constraints. The remaining quota of the volume constraints, if any, in a given interval will be used in the following scheduled run.

How should multiple actions for a customer be treated?



Individually for each action



As a group for the customer (output all actions)

Reset constraint counts



Individually



All at once



Maximum 50 Daily with Channel: Email

0 remaining



Maximum 20 Daily with Channel: Email, Action: StandardCard

1 remaining

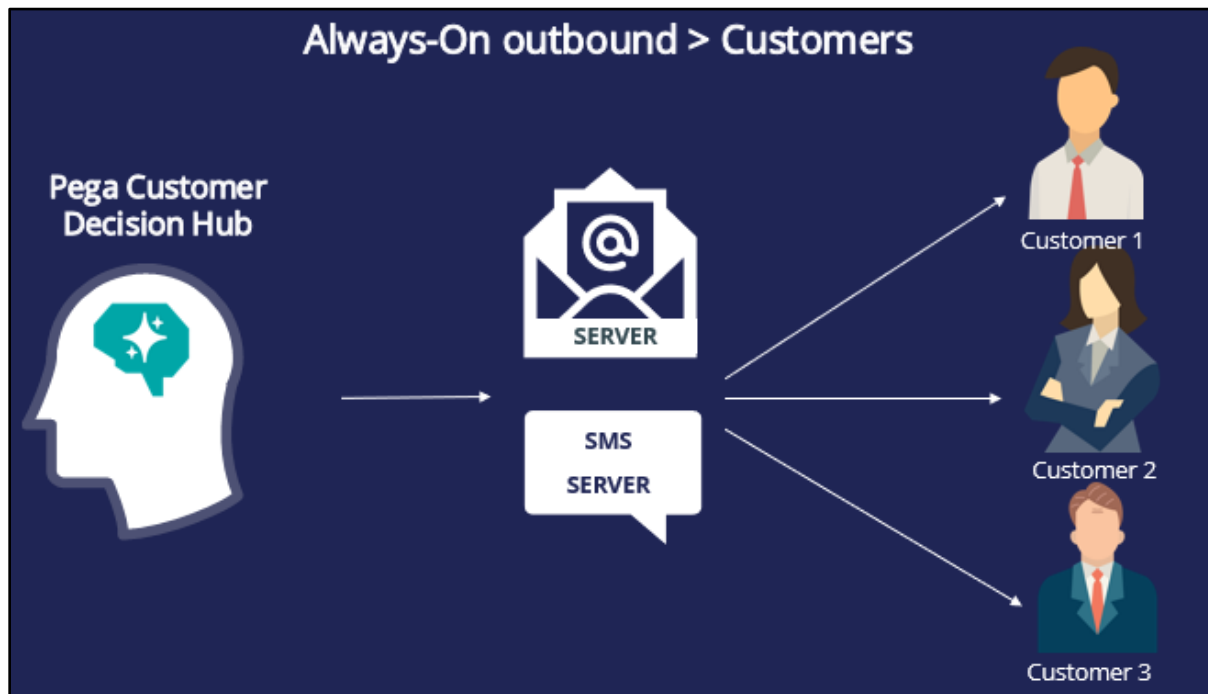


Sharing action details with third-party distributors

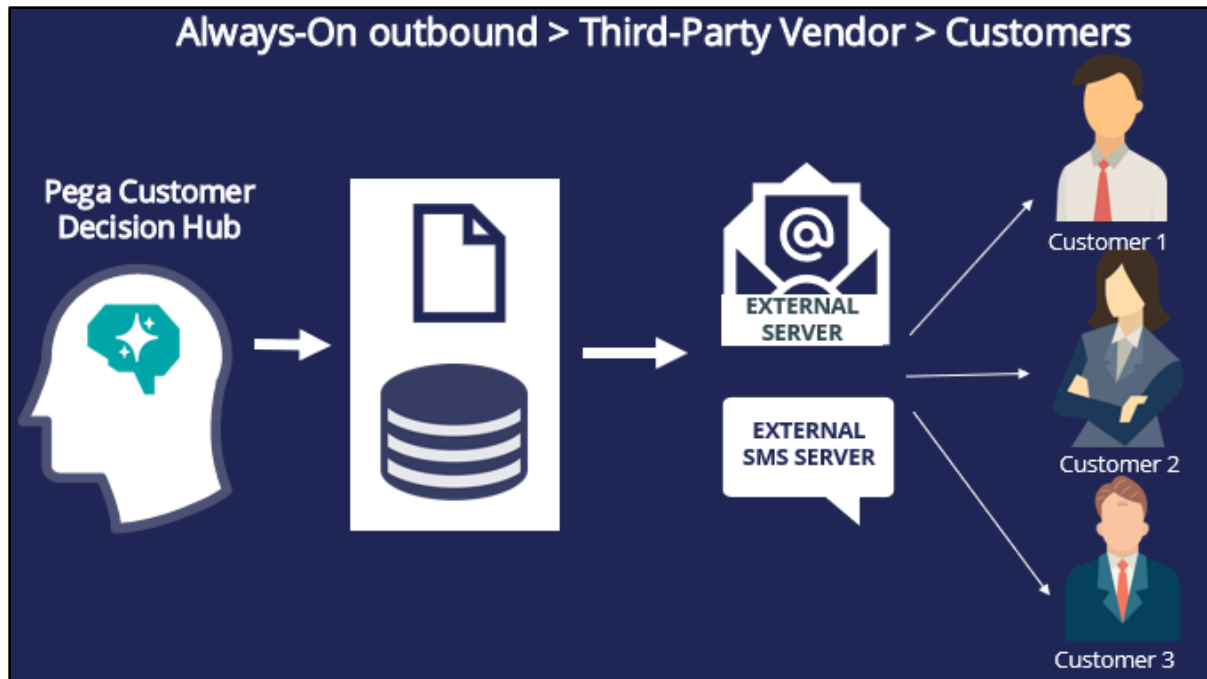
File and database templates

Why do you need outbound templates?

In outbound customer engagement, Pega Customer Decision Hub sends action messages to customers directly via email or SMS. That is, Pega Customer Decision Hub directly communicates with the email or SMS servers to send out outbound messages to qualified customers.



However, sometimes the necessary infrastructure to send action messages directly to customers may not be available. In such cases, you need to use a third-party email/SMS distributor. You need a medium to transfer the action and customer details, to a third-party distributor, which is typically a file or a database table.



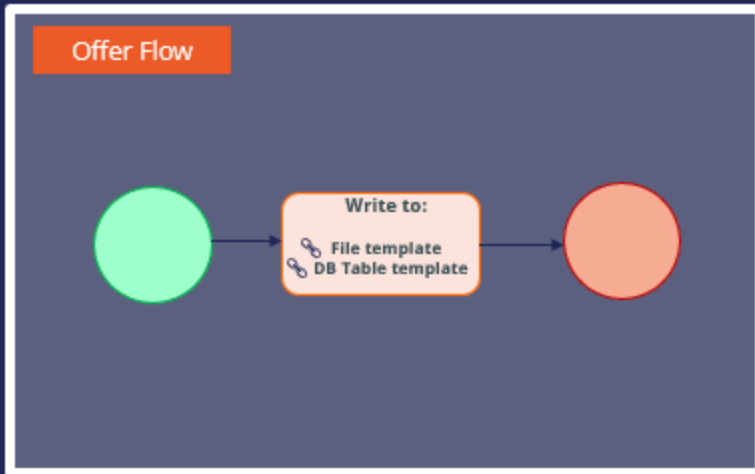
Pega Customer Decision Hub enables you to write the file in one of the following cloud-based destinations as well as the local filesystem.

- JFrog Artifactory
- Amazon S3
- Microsoft Azure

Writing action details to a file or database

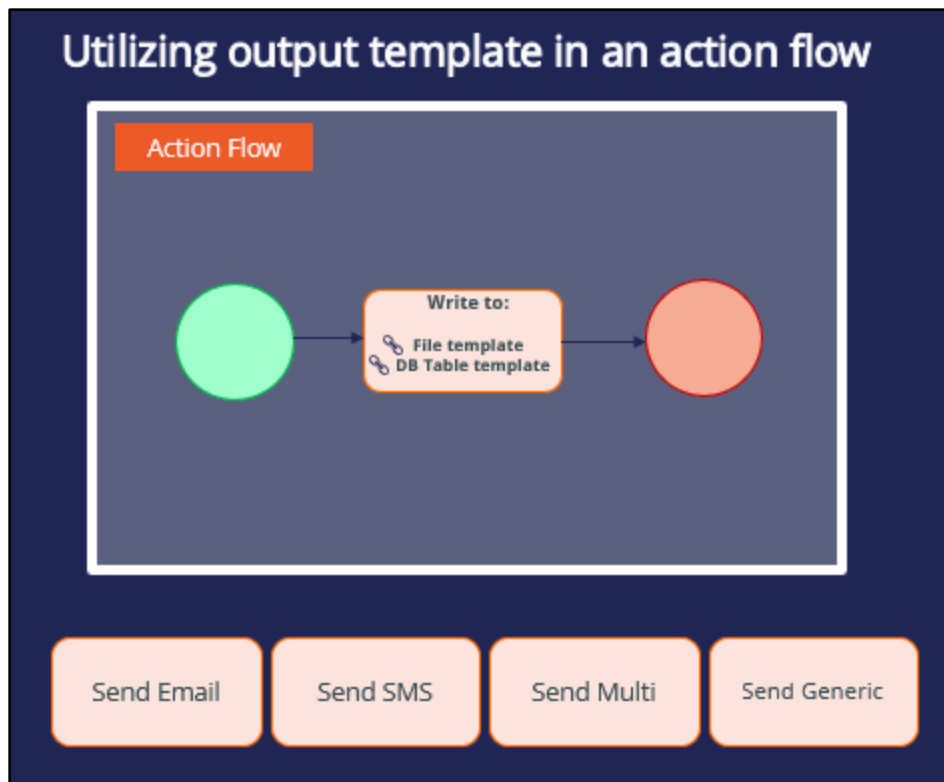
Pega Customer Decision Hub enables you to easily write action details to a file on the local system or on a cloud-based destination such as Amazon S3 or to a database table, which can be sent to a third-party vendor or application for distribution. To achieve this, you need to configure an action flow to include a Send shape with the file or database template option enabled.

Utilizing output template in an action flow



The four available Send shapes that can be used for this purpose are: **Send Email**, **Send SMS**, **Send Multi**, and **Send Generic**. Any one of these shapes can be used to write action details to a file or a database table. However, when you know that the action messages will be sent eventually via Email or SMS by the third-party vendor, it is better to use the corresponding shape, as this will clearly illustrate the purpose of the component and the channel will be recorded as an Email or SMS in the Interaction History.

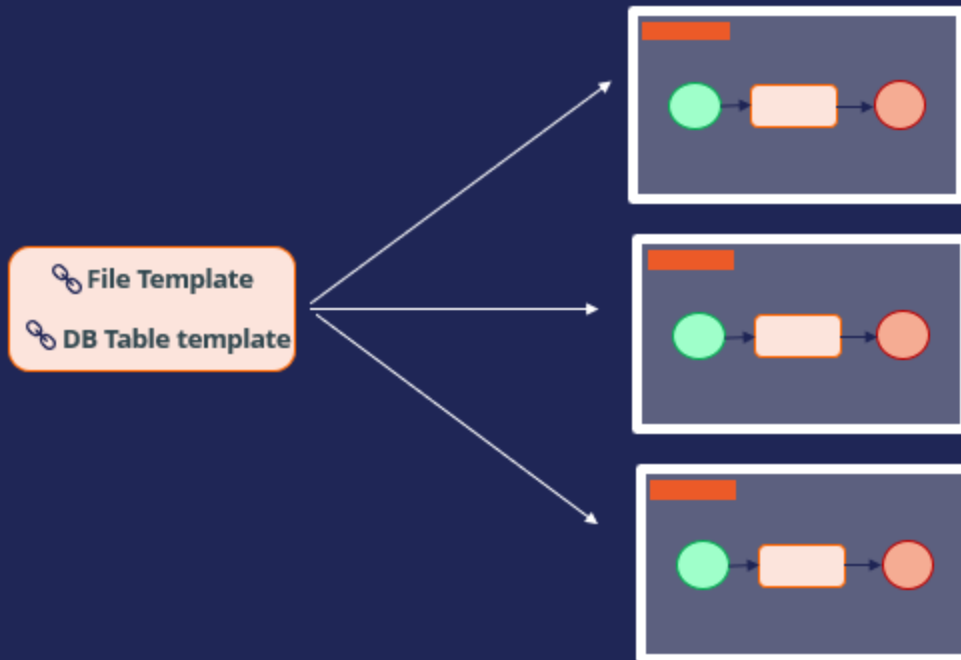
If you are unsure of the communication channel, or if it is a channel that Pega Customer Decision Hub cannot directly integrate with, use the Send Generic shape.



Multiple action details in a single location

Details of multiple actions can be written to the same file or database table. To do this, you need to configure the same file/database table template in multiple action flows. This functionality is useful when *the **Next-Best-Action outbound schedule** includes multiple actions. This approach consolidates multiple action details into a single location.*

One file template > Multiple action flows



Writing action details to a file or database

Business scenario

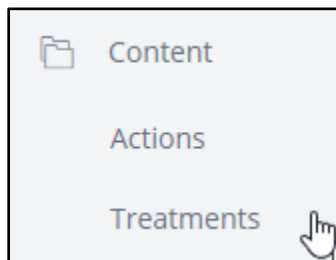
U+ Bank, a retail bank, sends credit card offers to eligible customers by email. However, to comply with the security and spamming regulations, the bank wants to use a third-party email delivery service instead of using the in-house email server. As a result, the offer details need to be written to a file that can be shared with a third-party email distributor.

Creating a file template

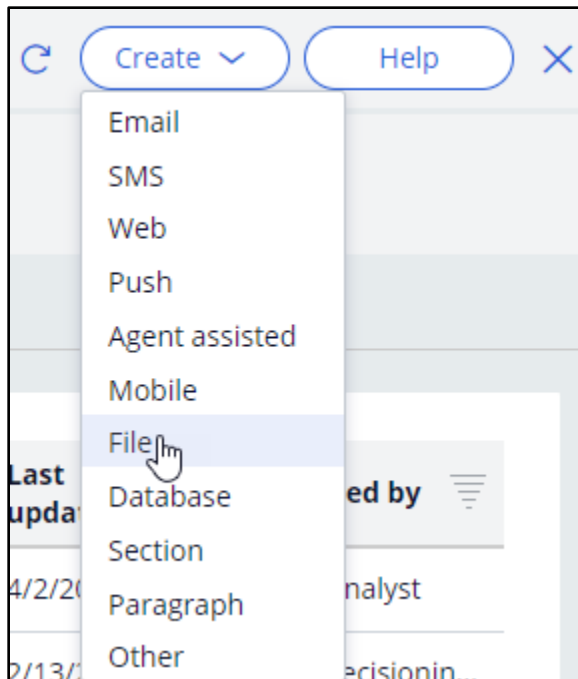
Pega Customer Decision Hub™ enables you to easily write action details to a file that can be sent to a third-party vendor or application for distribution.

To implement this business requirement, you need to configure a file template. The file template landing page can be accessed from the navigation menu, **Content** ->

Treatments.



You can create a new file template from this page.



Provide a short description for the new file template and the identifier is automatically populated when you tab out.

A screenshot of a web form titled 'Create file output template'. At the top right are two buttons: 'Create and open' (highlighted with a mouse cursor) and 'Cancel'. Below the title is a section 'Output Template Record Configuration'. It contains a text input field with the value 'Generic File Template' and a label 'Identifier' with the value 'GenericFileTemplate' and an 'Edit' link. Below this is a 'Categorization' section with two dropdown menus: 'Issue' (showing 'Select Issue') and 'Group' (showing 'Select Group').

Creating a repository

When configuring a file template, provide details on an existing repository or to create a new repository where the file needs to be stored.

In this case, you will create a new repository.

Edit file output template: Generic File Template [Available]

Definition Fields Finalize History

Repository name *

Local File System

File path *

Example file name

Provide a short description and a name for the repository to create one.

Create Repository

Create and open Cancel ?

Short description *

Local file repository

Repository name

Local file repository

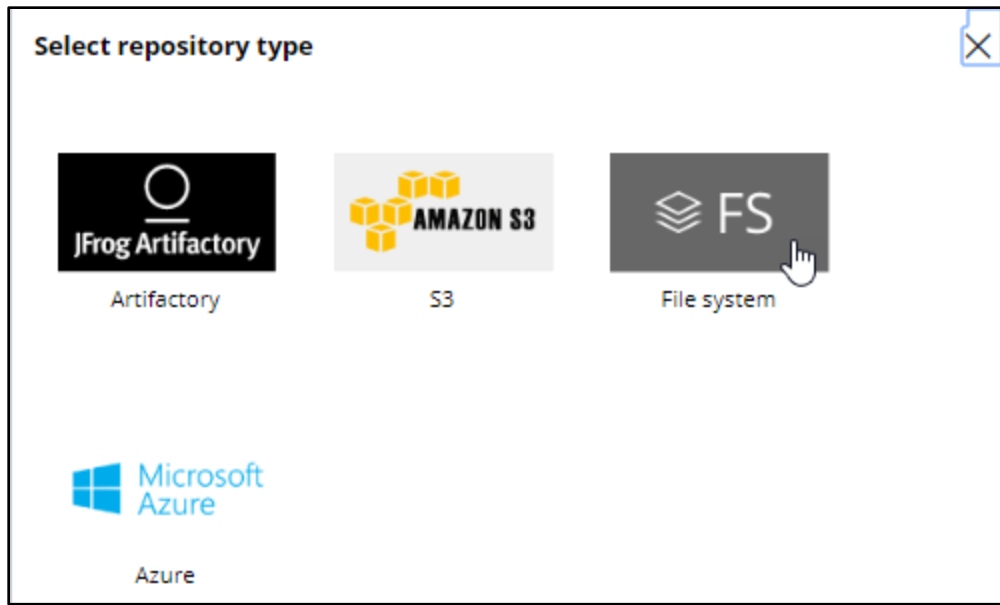
Select a **Repository Type** where you would like to store the file.

Definition History

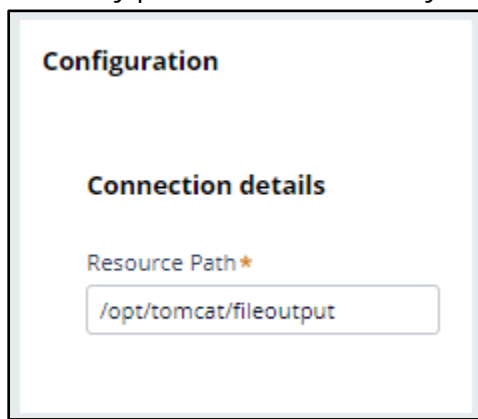
Repository type

Select

Pega Customer Decision Hub supports various cloud-based destinations as repository types such as **JFrog Artifactory**, **Amazon S3**, and **Microsoft Azure** in addition to the local file system.



When you select the **File system** repository type, in the **Resource Path**, provide a directory path in the local file system to where you want to store the file.



Configuring a file template

In the **Edit file output template** page, continue configuring the file template.

Select the repository and provide a path where the file needs to be stored. The location is a sub-directory under the directory specified in the file system repository. The format for the file path and name is folder/filename.

For example, if the repository path is */opt/tomcat/fileoutput* and the file path is *actions/output/mailling-list.csv*, then the file will be created under */opt/tomcat/fileoutput/actions/output*.

Output template finalization

Finalization is the technical process of writing data from an internal staging area to the final file. Finalized data is ready to be consumed by a different system. Finalization can be triggered manually or automatically by the system based on a schedule. Select the **Finalize template at the end of each outbound run option to trigger the finalization after each run.**

By finalizing a template at the end of each run, you ensure that all data in the file is the result of a single run. That is, the final output includes all data related to the run that triggered the finalization. If you want the data from multiple outbound runs to be written to the same file, leave this option unselected. When you leave this option unselected, you have to configure a separate finalization schedule in the **Finalize** tab or finalize the file manually in the **Treatments > File** landing page.

If you chose to finalize at the end of each run, select **Include run ID in the file name** to include the run ID for easier identification of the files generated in each run.

The screenshot shows the 'Edit Generic File Template' interface with the 'Finalize' tab selected. The breadcrumb trail is 'Sales > CreditCards > GenericFileTemplate > File' with a link to 'PegaCRM-Artifacts:01-01-01'. The tabs are 'Definition', 'Fields', 'Finalize', and 'History'. The 'Finalize' tab contains the following configuration options:

- Repository name ***: A text field containing 'LocalFileSystem'.
- File path ***: A text field containing 'actions/output/mailling-list.csv'.
- Example file name**: A text field containing 'mailling-list_PR1_2020-04-16_062743.csv'.
- Finalize template at the end of each outbound run**: A checked checkbox.
- Include run ID in file name**: A checked checkbox.
- Include finalization date-time in file name**: A checked checkbox.
- Delimiter type ***: A dropdown menu set to 'Character'.
- Delimiter ***: A text field containing a comma (',').

In the **Fields** tab, you can configure the information elements that you want to output.

That is, you can configure the customer and action details that you want to share with the third-party email distributor. In the **Name** field you enter a name for the field. In

the **Content** field, you select the corresponding property. Use the *.Customer.* construct to access customer properties and *.OfferData.* construct to access action properties.

The screenshot shows the 'Fields' tab of a configuration interface. It features a table with four columns: Name, Type, Content, and Format. There are five rows of field configurations, each with a delete icon on the right. At the bottom left, there is a '+ Add' button.

Name	Type	Content	Format
Customer_ID	Data f	.Customer.Custo	n/a
Customer_Name	Data f	.Customer.pyFull	n/a
Customer_Email	Data f	.Customer.pyEm	n/a
Offer_Key_Code	Data f	.OfferData.KeyCc	n/a
Offer_Name	Data f	.OfferData.pyNa	n/a

+ Add

In the **Finalize** tab, you can configure further finalization options.

The screenshot shows the 'Finalize' tab of a configuration interface. It contains three sections: 'Schedule' with an 'Enable schedule' checkbox, 'Delivery options' with a 'Send Email notifications when finalized from the Landing Page' checkbox, and an 'Advanced' section indicated by a right-pointing chevron.

Schedule

☐ Enable schedule

Delivery options

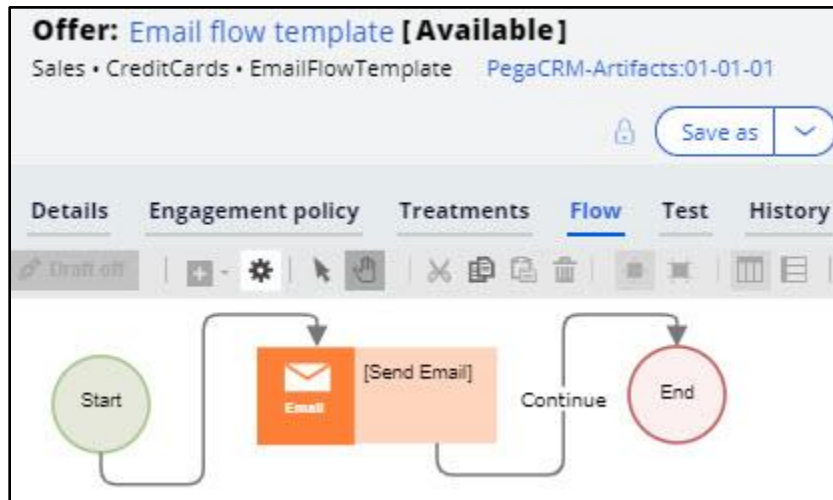
☐ Send Email notifications when finalized from the Landing Page

> **Advanced**

The **Advanced** section can be used for additional processing during the finalization process. For example, you can use it to initiate the file transfer to a particular location.

Using the file template in an action flow

You need to configure one of the **Send*** shapes, that is, Send Email, Send SMS, Send Generic or Send Multi shapes, in the action flow to reference the file template, so that the action details are written to the output file during an outbound run.



To write action details to a file template, select the **Specify Treatment** option. Now, select a treatment and reference the file template in the **Write To File** option.

The 'Send Email properties' dialog box is shown. The 'Treatment' section is active, with the 'Specify Treatment' radio button selected. The 'Treatment Name' is 'StandardCardEmail' and the 'Key Code' is 'STANARDEMAIL'. The 'Write To File' checkbox is checked and highlighted with a red box. The 'Select Template' dropdown is set to 'GenericFileTemplate'. Other options include 'Deliver Online', 'Write to DB', and 'Wait after sending'. The 'Submit' button is visible at the bottom right.

To write action details to a file, run an outbound schedule. The file with action details will be stored in the specified repository.

```
[root@ip-172-31-20-32 output]# wc -l mailing-list_PR12_2020-04-16_122456.csv
42 mailing-list_PR12_2020-04-16_122456.csv
[root@ip-172-31-20-32 output]# more mailing-list_PR12_2020-04-16_122456.csv
Customer_ID,Customer_Name,Customer_Email,Offer_Key_Code,Offer_Name
CON-894,Adrienne Marks,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-752,Angus Schultz,customer1@enablement.com,STANDARD CARD,StandardCard
CON-539,Antwon Graham,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-220,Freeman Schinner,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-306,Deondre Predovic,customer1@enablement.com,STANDARD CARD,StandardCard
CON-245,Jacey Hilpert,customer1@enablement.com,STANDARD CARD,StandardCard
CON-880,Lourdes Rohan,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-613,Roscoe Skiles,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-123,Mose Macejkovic,customer1@enablement.com,STANDARD CARD,StandardCard
CON-986,Delta Toy,customer1@enablement.com,STANDARD CARD,StandardCard
CON-79,Madge Renner,customer1@enablement.com,STANDARD CARD,StandardCard
CON-347,Pearlie Collier,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-766,Nelle Davis,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-367,Eleanora Larson,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-140,Ali Emmerich,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-338,Melvina Ledner,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-107,Pete Kerluke,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-916,Haskell Cumberata,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-141,Reva Koelpin,customer1@enablement.com,STANDARD CARD,StandardCard
CON-186,Clay Leffler,customer1@enablement.com,STANDARD CARD,StandardCard
CON-610,Claude Runolfsdottir,customer1@enablement.com,STANDARD CARD,StandardCard
CON-719,Aliza Doyle,customer1@enablement.com,STANDARD CARD,StandardCard
CON-688,Gwen Mertz,customer1@enablement.com,STANDARD CARD,StandardCard
CON-830,George Boyle,customer1@enablement.com,STANDARD CARD,StandardCard
CON-336,Kale Franecki,customer1@enablement.com,STANDARD CARD,StandardCard
CON-479,Elna Hessel,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-405,Glenna Emard,customer1@enablement.com,STANDARD CARD,StandardCard
CON-111,Dorcas Schumm,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-508,Madelyn Carter,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-804,Ahmad Gleason,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-939,Garrison Brekke,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-118,Joanny Pfeffer,customer1@enablement.com,STANDARD CARD,StandardCard
CON-519,Destini Vandervort,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-587,Caden Dibbert,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-528,Kaleb Aufderhar,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-163,Oran Beer,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-493,Trace Zboncak,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-654,Antonio Walsh,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-518,Germaine Schamberger,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-571,Charlie Hoppe,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
CON-938,Cristina Satterfield,customer1@enablement.com,REWARDSPLUSCARD,RewardsPlusCard
[root@ip-172-31-20-32 output]#
```

The file contains the fields as configured in the file template.

Writing action details to a database

Similar to writing details to a file, you can make the outbound run write details to a database table using a database template. The process of creating a database template is

similar to creating a file template. Instead of the repository, file path, and file name configurations, you must provide the **Database** name and **Table** name.

Edit database output template: Generic Output Template [Available]

Actions Save

Definition Fields Finalize History

Database ★
ExternalMKTDData

Table ★
NBA_OUT

☐ Finalize template at the end of each outbound run

Writing option
☒ Overwrite existing data
☐ Append to existing data

Bypassing action flow processing

In the always-on outbound scenario, you can bypass the action flow processing and write action details to a database table directly with a database template. Use this feature when you do not need to perform multiple steps in the life cycle of an action (such as send an action message, wait for a response, or take appropriate action upon response).


To use this feature, go to **Next-Best-Action Designer, Channel**. Under the **Primary schedule** section, click the gear icon next to **Recurrence** to access the outbound schedule configuration. Enable the **Write results using a database template** option to add a database template.

Note: Here, you can configure only database templates that have the **Writing option** set to **Append to existing data**.

Configure outbound schedule

☒ Every weekday
☐ Every day or every nth day

Start

4/23/2020 1:03 AM 

End

☒ No end date
☐ Set number of occurrences
☐ End by a date

☒ Refresh the audience

☒ Refresh the audience for each scheduled occurrence
☐ Refresh the audience only for the first scheduled occurrence

☒ Write results using a database template
GenericDBTemplate

[+ Add template](#)