Pega Customer Decision Hub Foundation

STUDENT GUIDE

PEGA Academy

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One-to-one customer engagement

Description

Familiarize yourself with the one-to-one customer engagement paradigm. Learn about the business problems Pega Customer Decision Hub™ can solve and discover how Pega's omni-channel AI delivers the right action during every customer interaction.

Learning objectives

- Explain the basics of the Next-Best-Action approach
- Describe the purpose of Next-Best-Action Designer and its user interface

Next-Best-Action paradigm

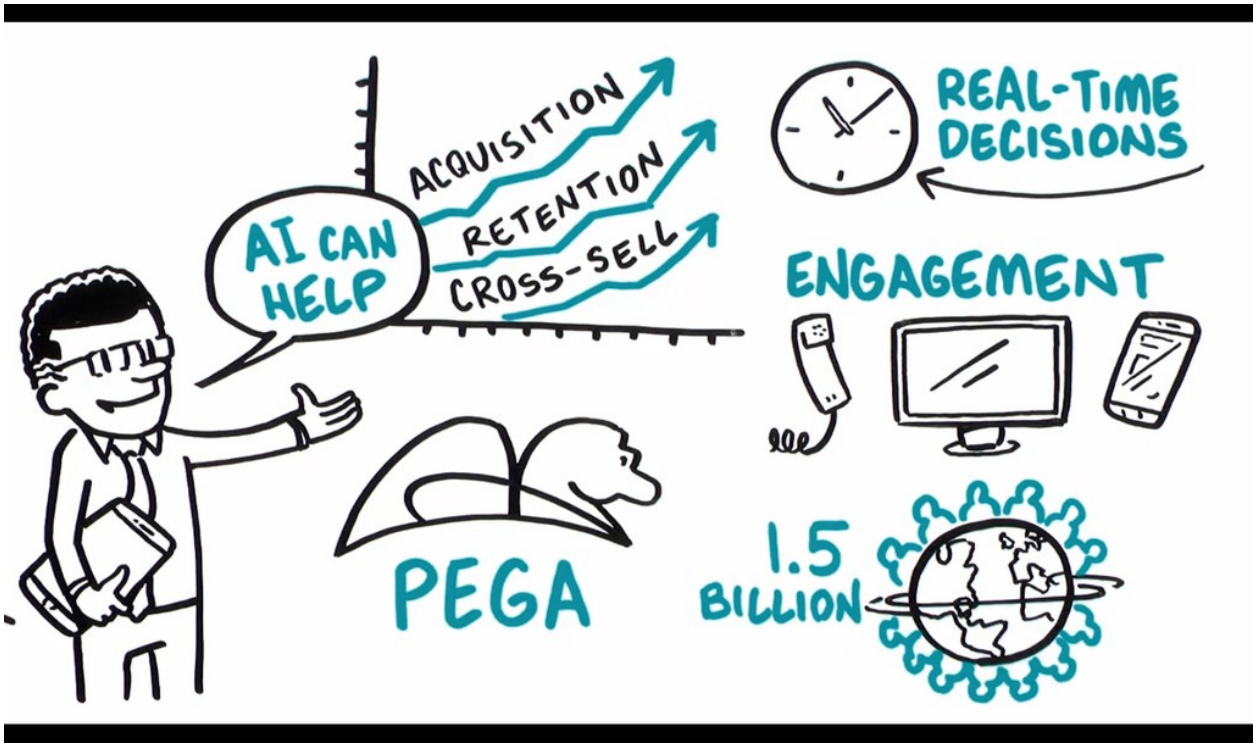
Introduction

The value of big data and analytics is fully realized when every customer conversation delivers exactly the right message, the right offer, or the right level of service to provide a great experience while maximizing the customer's value to the organization. With Pega Next-Best-Action, business experts develop decision strategies that combine predictive and adaptive analytics with traditional business rules to maximize this value.

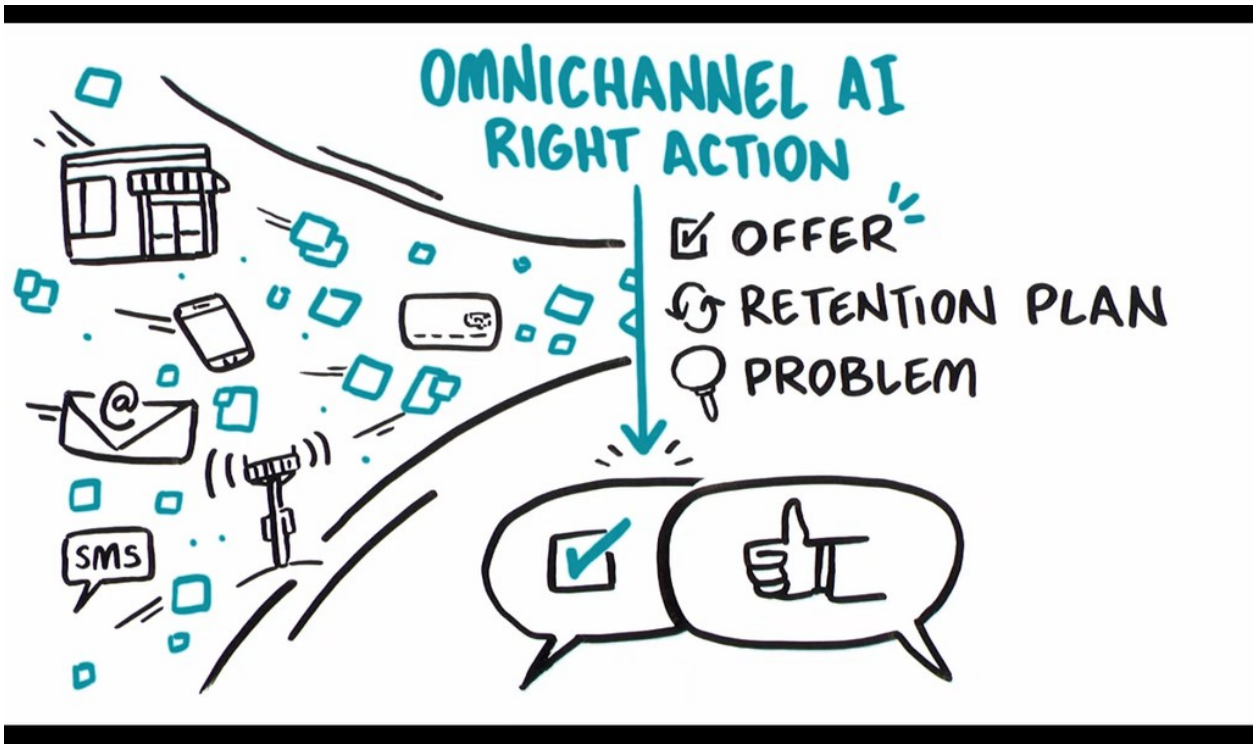
Transcript

This is your customer. You want him to buy your products, use your services and have a great experience. And your competitors want the same thing. To compete, you have to take the right action at every customer touch, ensuring that each conversation delivers exactly the right message, offer and level of service. You want to provide a great experience, while maximizing the customer's value to your organization.

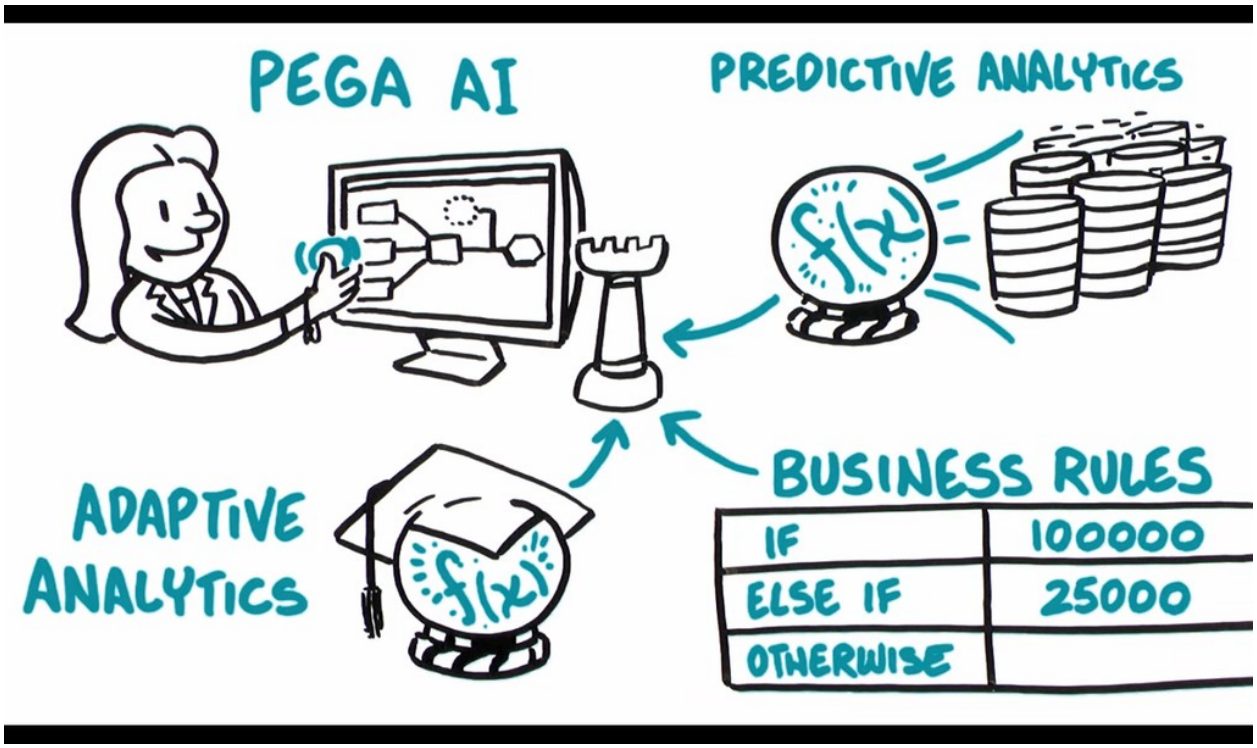
Artificial Intelligence, or AI, can help—if you can get past the hype. Pega has been using AI to create real business value for years, driving real-time decisions that deliver awesome engagement on any channel...and improving experiences for over 1.5 billion customers across the globe.



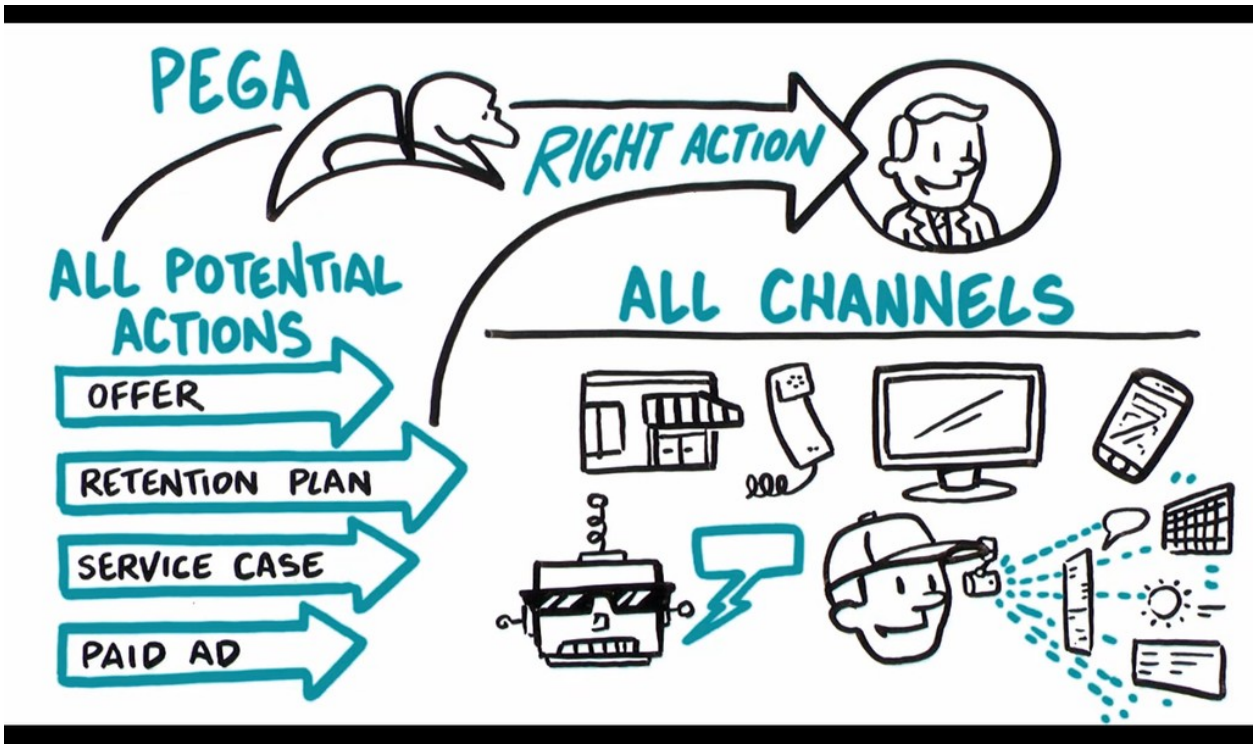
Pega's omni-channel AI delivers the right action at every customer touch by crunching millions of data points in real-time. Make an offer, initiate a retention plan, predict a problem before it happens. Every decision generates the next-best-action for your customer, and your business.



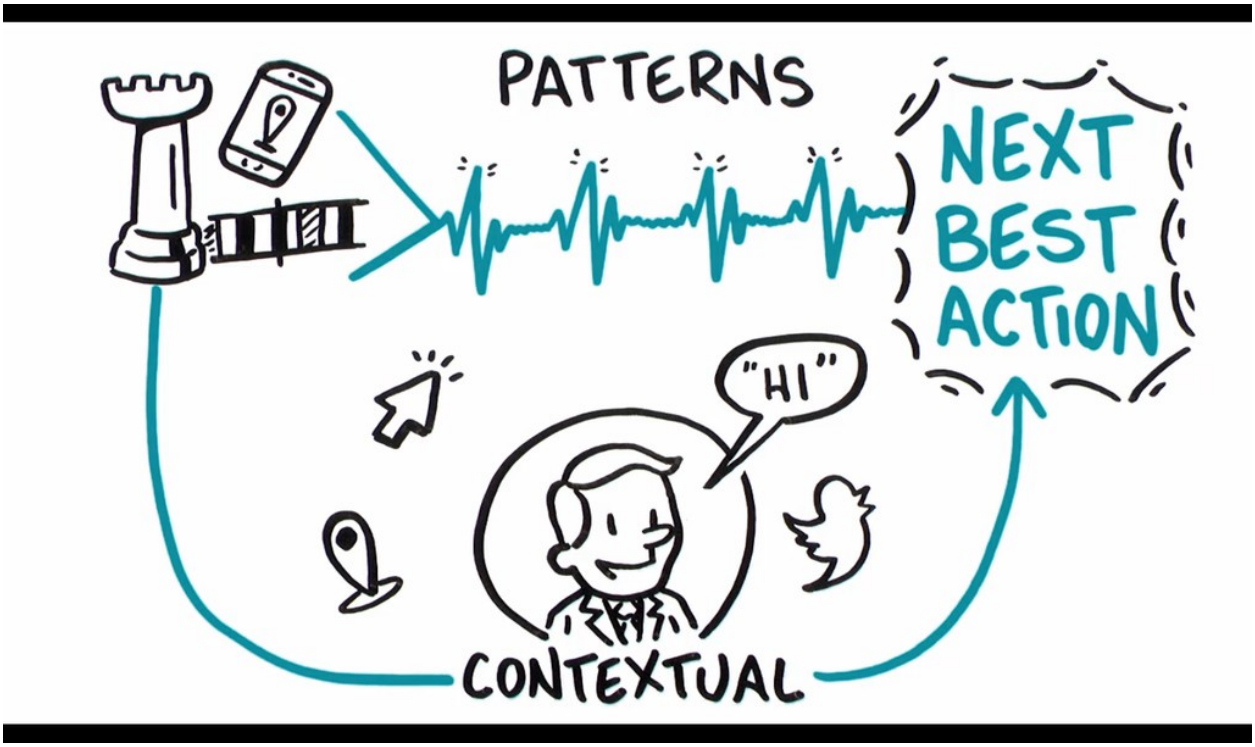
Pega's AI is built for business people, not scientists or developers. They design visual decision strategies that combine predictive analytics, algorithms developed through mining large sets of data, adaptive analytics, machine-learning algorithms that improve with each interaction, and traditional business rules that allow users to prioritize and arbitrate between decisions.



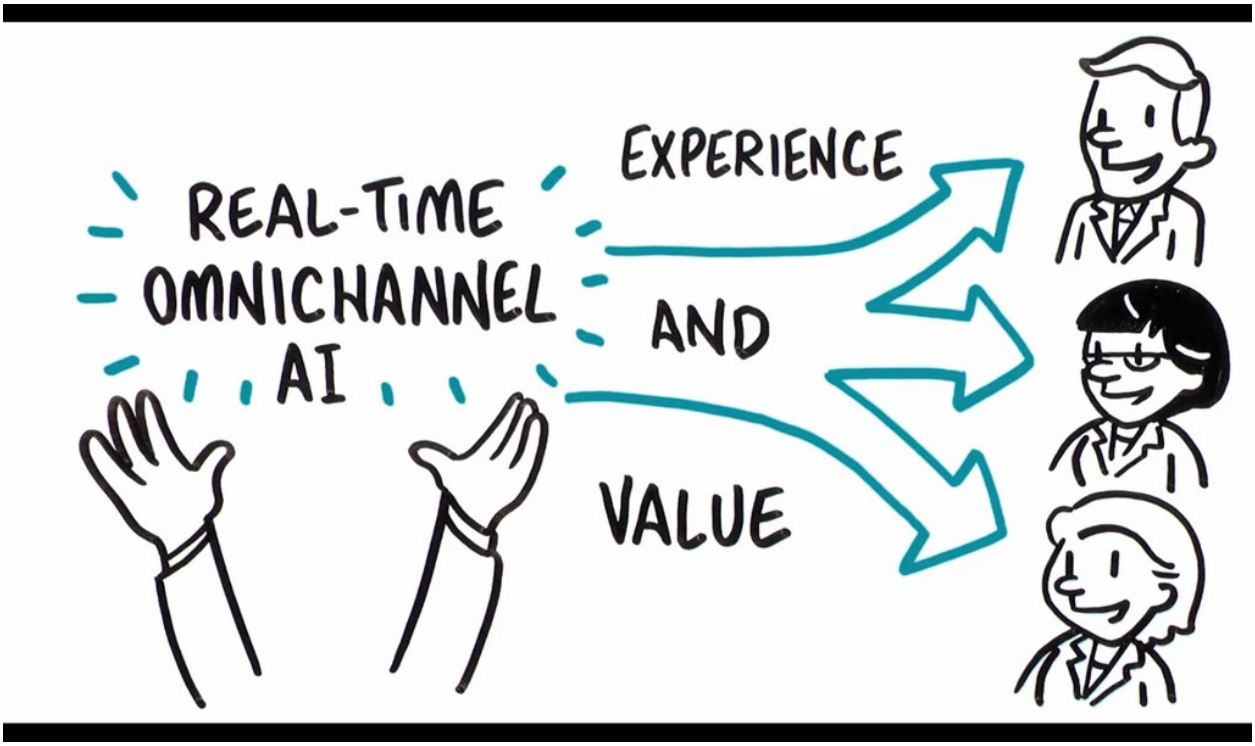
Pega uses the strategy to look across all the potential actions you may take with a customer, make an offer, initiate a retention plan, open a service case, place an ad, and ensure exactly the right action is taken at every interaction and it works across all channels to provide a consistent experience in a store, on the phone, on the web, mobile, with the chat bot, or just some crazy tech that hasn't even been invented yet.



And Pega connects to streams like mobile locations or network events to detect patterns and drive the Next Best Action proactively. And strategies are completely contextual. Any change in the customer's context — a click, a reply, a location change, a Tweet — will trigger the Next Best Action. So, you can really listen to your customers and act accordingly.



Pega's real-time, omni-channel AI puts the power in your hands, so you can optimize every customer interaction for experience, and value.



One-to-one customer engagement paradigm

Introduction

The optimal outcome of every customer interaction is to provide a great experience while maximizing the customer's value to the company. To achieve this, you have to be able to perform the right action in the right channel at the right moment for each customer. We call this capability, "1-to-1 Customer Engagement".

Transcript

In this video, learn about the 1-to-1 Customer Engagement paradigm and how the principles of Next-Best-Action are implemented using the Pega Customer Decision Hub™.

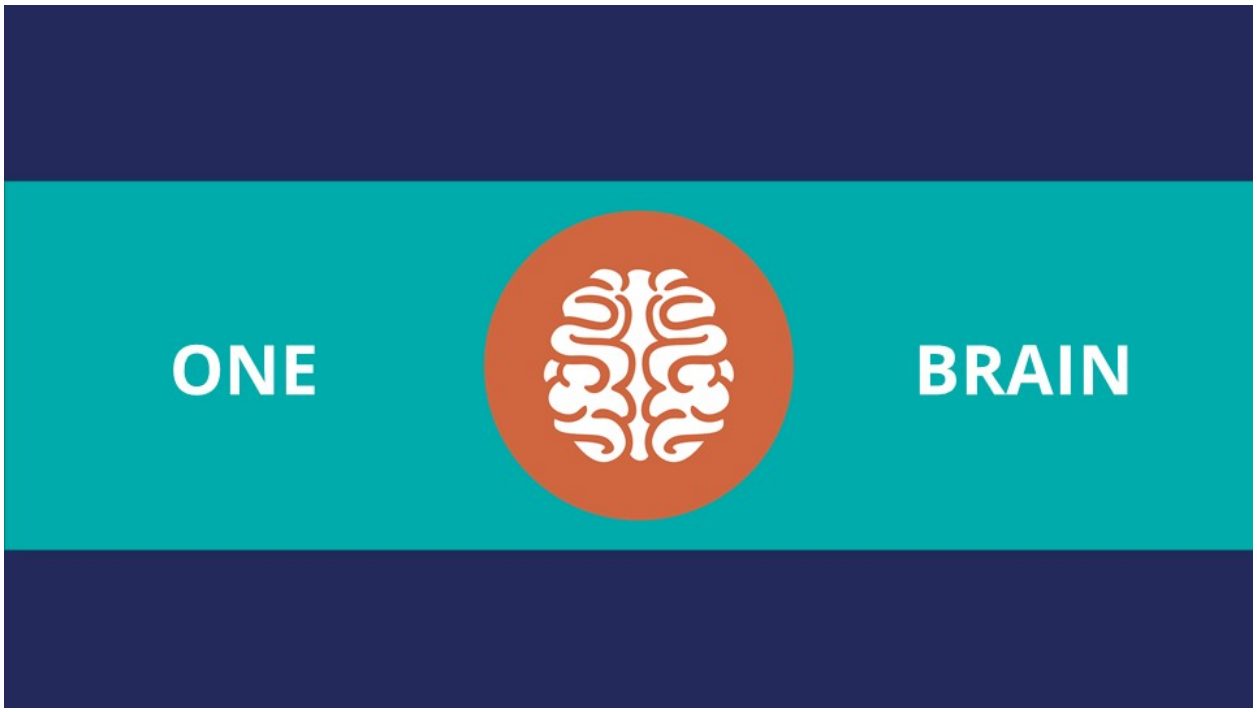
Customers are more empowered than ever before. As a result, they have very high expectations of the experiences they receive from their service providers. Their experiences must make sense within the context of their lives. This means they must be meaningful, consistent, and personalized across every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

In business, the optimal outcome of every customer interaction is to provide a great experience while maximizing the customer's value to the company. To achieve this, you have to be able to perform the right action in the right channel at the right moment for each customer.

We call this capability, "1-to-1 Customer Engagement".

1-to-1 Customer Engagement enables companies to transition their marketing away from a traditional one-to-many campaign-driven approach. A one-to-one approach allows companies to have consistent, contextual and relevant conversations with individual customers across any channel or touch point.

The key to achieving 1-to-1 Customer Engagement is an idea that's simple to conceive, but very difficult to execute: one centralized brain.

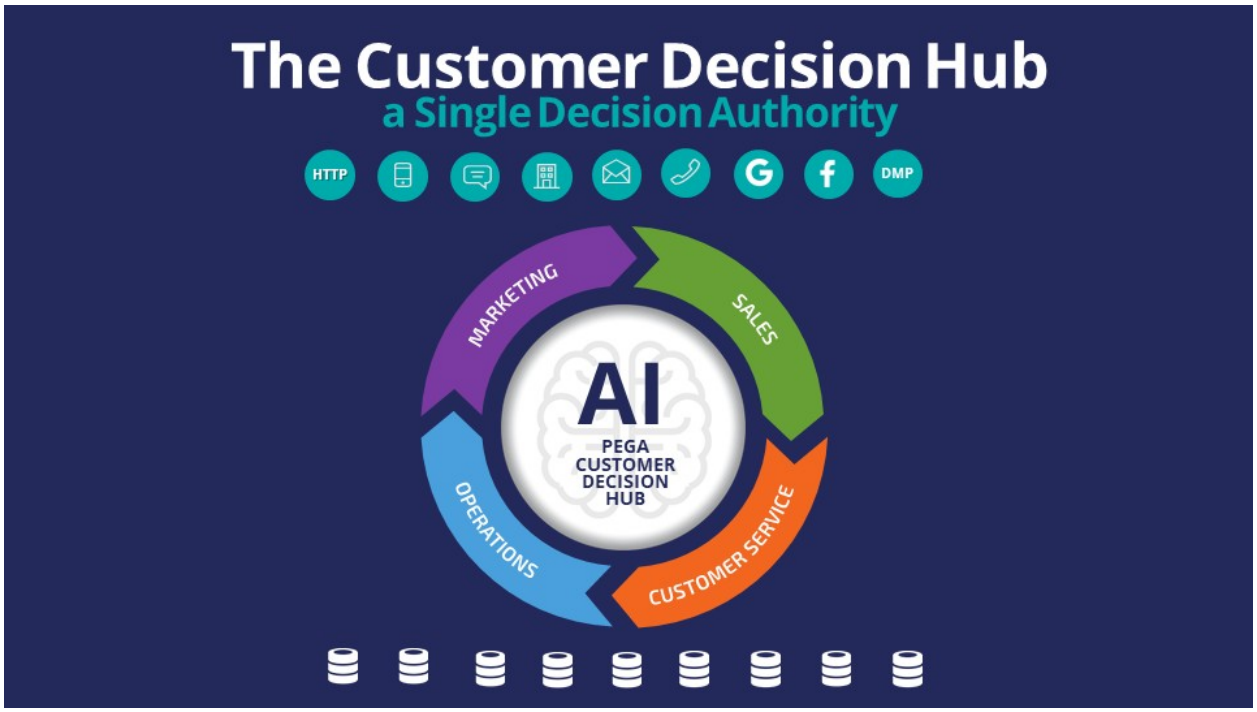


In other words, one piece of intelligence that acts as a single decision authority across your application ecosystem.

Each channel or system profits from this single source of customer intelligence and can leverage it to gain insights or perform relevant actions.

In Pega Marketing™, this centralized brain is called the Pega Customer Decision Hub, and it leverages AI to enable 1-to-1 Customer Engagement.

In Pega Infinity™, the Pega Customer Decision Hub forms the core of the customer engagement platform, which sits at the center of existing systems and channels in an enterprise.



Data from every customer engagement across the enterprise is collected by the Brain and used to make predictions and decisions about every interaction in every channel.

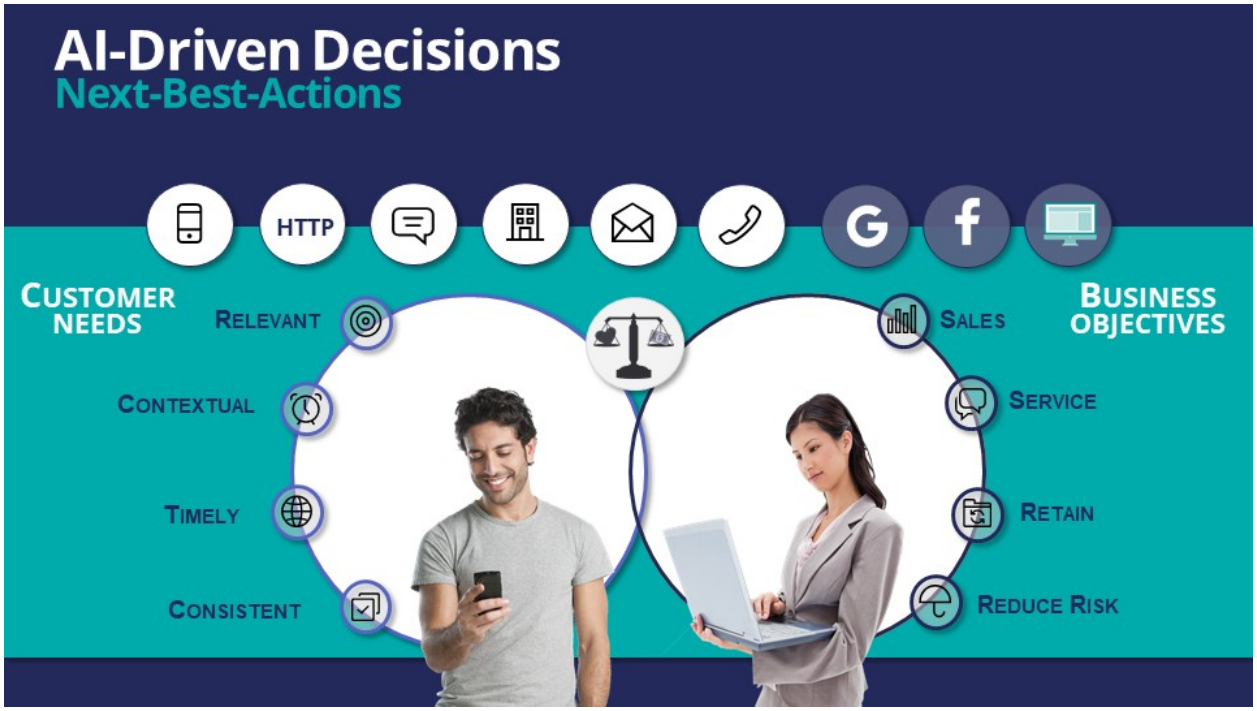
Continuous learning and decision-making are the foundation of a 1-to-1 Customer Engagement solution.

The Customer Decision Hub combines analytics, business rules, customer data, and data collected during each customer interaction to create a set of actionable insights that it uses to make intelligent decisions. These decisions are known as the Next-Best-Action.

Every Next-Best-Action weighs customer needs against business objectives to optimize decisions based on priorities set by the business manager.

In the milliseconds before interacting with a customer, the Customer Decision Hub processes thousands of predictive and adaptive models to determine customer needs, considering the customer's immediate context to ensure the Next-Best-Action is relevant, timely, and contextual. These models can be propensity, risk, or churn models.

Next, the decision strategy considers business rules and matches those with the customer's context and higher-level business goals.



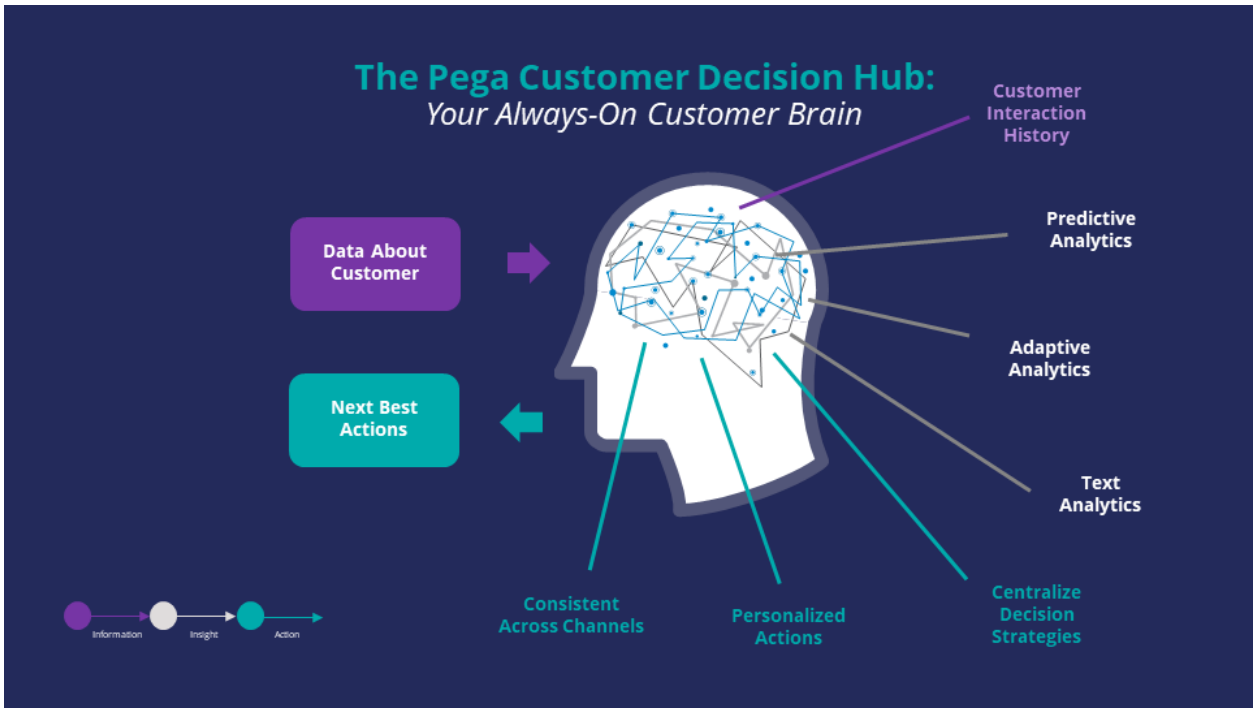
All of this information is used by the Next-Best-Action decision strategy to evaluate every potential action that could be taken with a particular customer in a given situation. The decision strategy then recommends the best way to interact with the customer to achieve the optimal result.

Using the Next-Best-Action approach, the Customer Decision Hub is able to identify the best moments for making a sale, providing a service, making a retention offer, or doing nothing at all (e.g. if nothing is relevant enough to warrant the customer's attention). Next-Best-Action is even able to select which offers are most likely to be accepted by the customer in a sales or retention situation. Next-Best-Action decisions are distributed, in real-time, to each of your real-time owned channels, such as web, mobile, and contact center. Through Pega Marketing, Next-Best-Actions can also be distributed to real-time paid channels such as Google, YouTube, Facebook, LinkedIn and Instagram. Pega Marketing also integrates with non-real time outbound channels such as data management platforms (DMPs) and email.

Once the Next-Best-Actions are distributed and customer responses have been received by the Brain, the whole process begins again, and new Next-Best-

Actions are distributed within milliseconds. Every outbound channel, including a data management platform, is dynamically updated with the Next-Best-Action to ensure consistency and an optimized customer experience no matter which channel the customer interacts with.

In summary, the Pega Customer Decision Hub is the Always-On Brain that acts as a single, centralized decision authority.



It uses data about the customer, including past interactions, as input.

It leverages advanced AI techniques to make predictions.

And it uses decision strategies (which combine traditional business rules with predictive, adaptive and text analytics), to deliver consistent and personalized Next-Best-Actions across all channels.

Next-Best-Action Designer

Introduction

Next-Best-Action Designer guides you through the creation of a Next-Best-Action strategy for your business. Its intuitive interface, proven best practices and sophisticated underlying decisioning technology enable you to automatically deliver personalized customer experiences across inbound, outbound and paid channels. Next-Best-Action Designer is organized according to the high-level sequence of steps needed to configure the Next-Best-Action strategy for your organization.

Transcript

Next-Best-Action Designer guides you through the creation of a Next-Best-Action strategy for your business. Its intuitive interface, proven best practices and sophisticated underlying decisioning technology enable you to automatically deliver personalized customer experiences across inbound, outbound and paid channels.

The Next-Best-Action Designer user interface allows you to easily define, manage and monitor Next-Best-Actions.

The tabs across the top of the user interface represent the steps that need to be completed to define Next-Best-Actions.

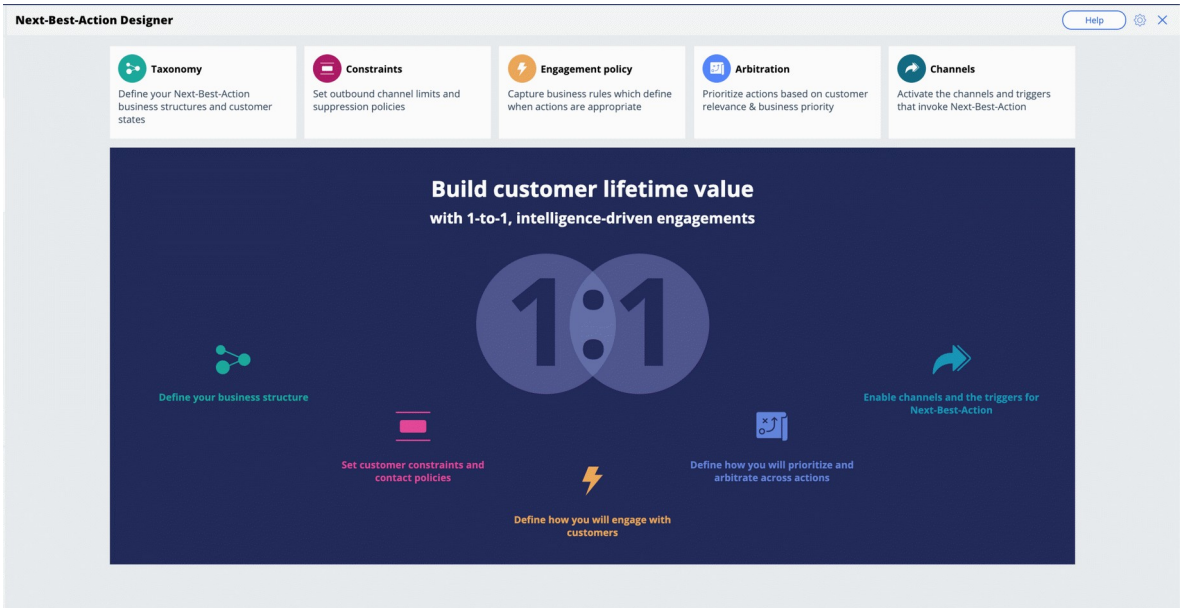
Use the **Taxonomy** component to define the business structure for your organization.

Use the **Constraints** component to implement channel limits and constraints.

Use the **Engagement policy** component to define the rules that control which actions are offered to which customers.

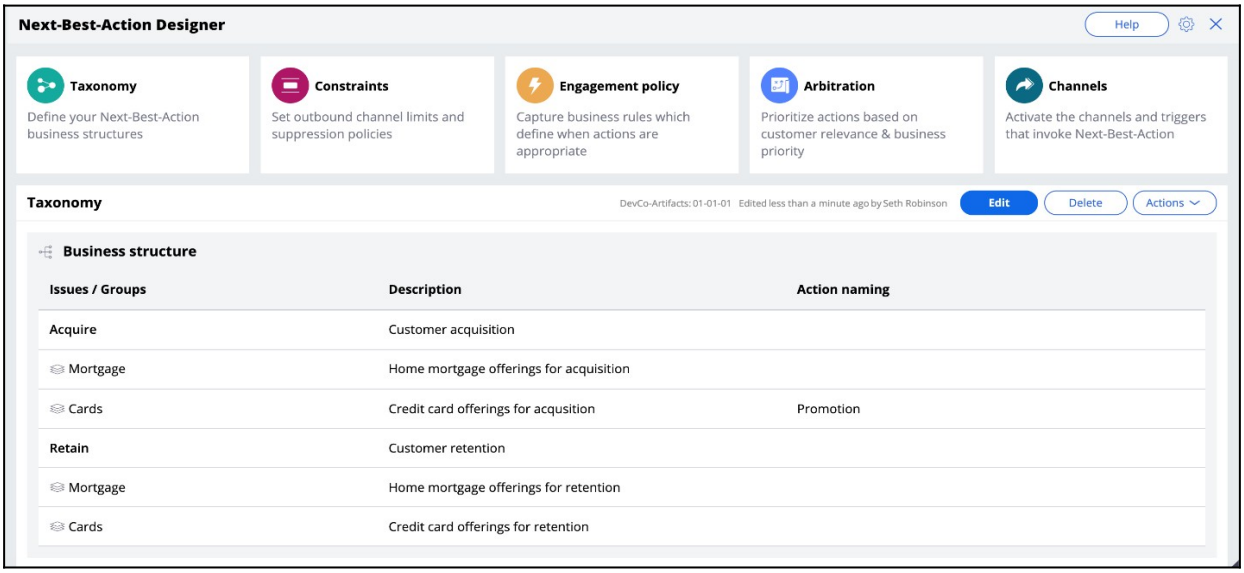
Use the **Arbitration** component to configure how actions are prioritized.

Use the **Channels** component to configure when and where Next-Best-Action is triggered.



The system uses these definitions to create an underlying Next-Best-Action Strategy framework. This framework leverages best practices to generate Next-Best-Action decision strategies at the enterprise level. These decision strategies are a combination of the business rules and AI models that form the core of the Pega Centralized Decision Hub, which determines the personalized set of Next-Best-Actions for each customer.

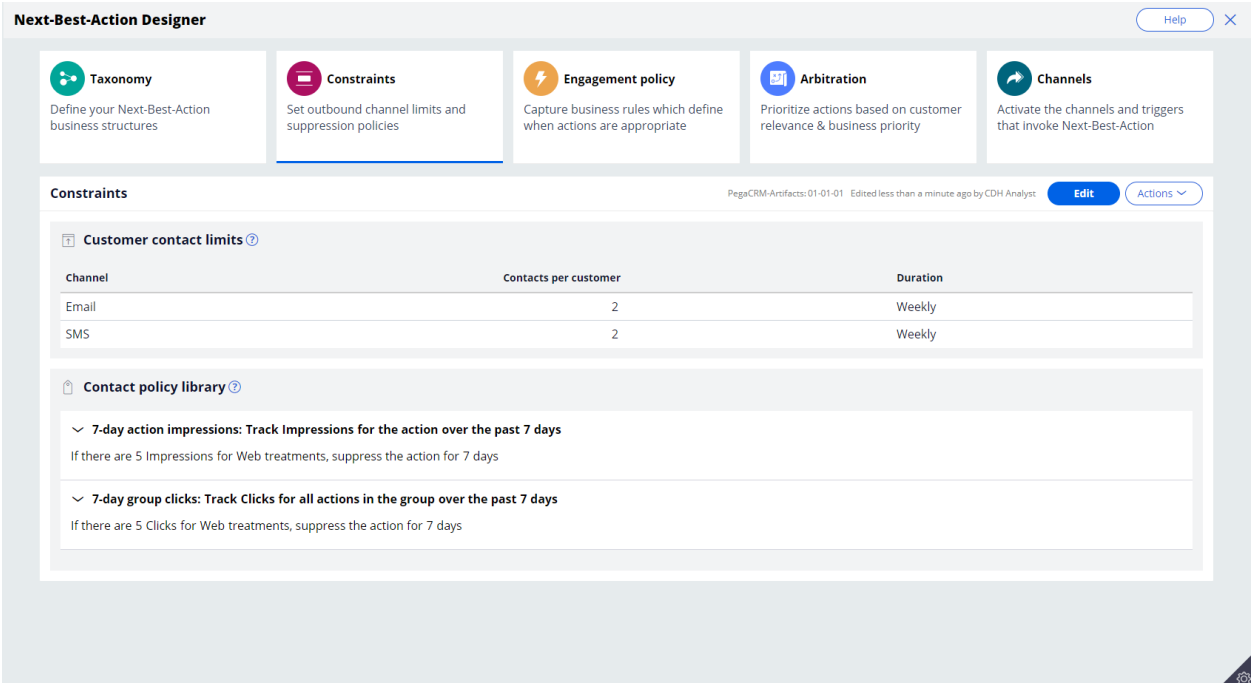
Use the **Taxonomy** component to define the hierarchy of Business Issues and Groups to which an action belongs.



A Business Issue is the purpose behind the actions you offer to customers. For example, actions with the purpose of retaining existing customers should be grouped under the business Issue of Retention. Actions with the purpose of acquiring new customers belong to the business Issue of Acquisition.

Business Groups are used to organize customer actions into categories. For example, as part of the business Issue of Acquisition, you can create Groups for products like Credit Cards, Mortgages, or Personal Loans, with the intention of offering these to potential customers.

Use **Constraints** to specify outbound contact limits as well as to limit overexposure to a specific action or group of actions.

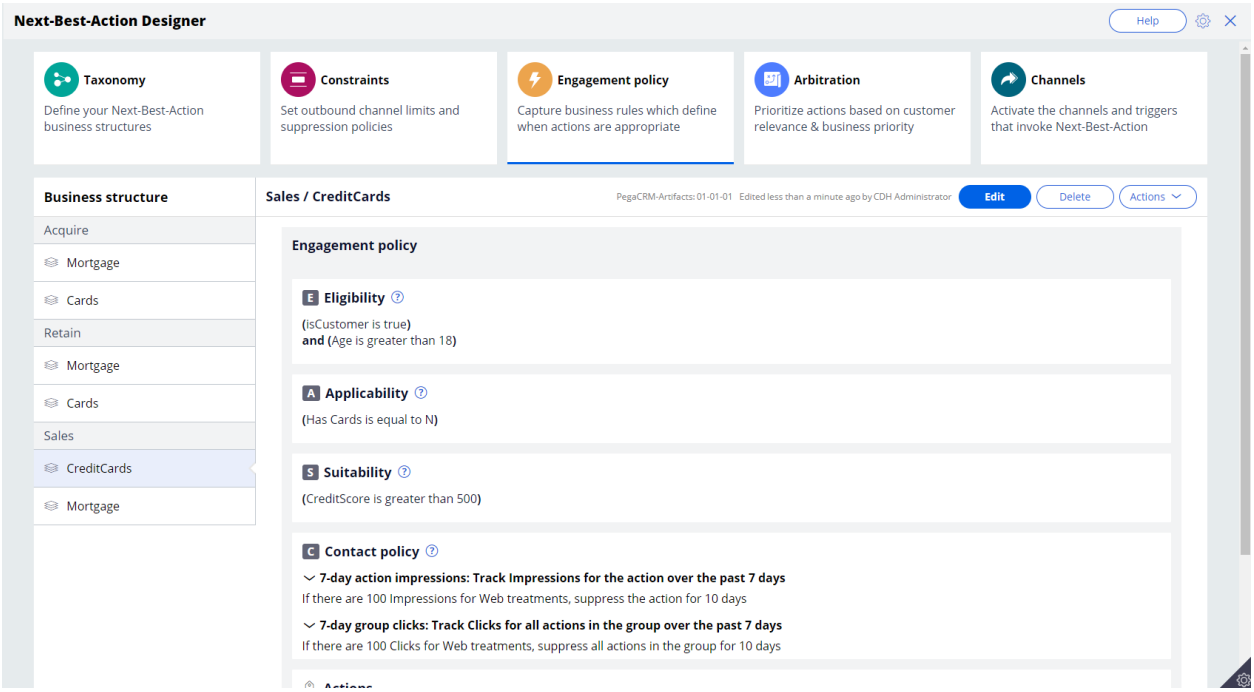


Customer contact limits allow you to limit the number of interactions that a customer can receive over a given period of time on a specific channel. For example, you can decide that you do not want your customers to receive more than two emails per week or two SMS messages per week.

On the Constraints tab of Next-Best-Action Designer, you can define more extensive suppression rules by creating Contact Policy rules in the library. Contact Policy rules are reusable across all Business Issues and Groups.

In the Contact Policy library, you define suppression rules that automatically put an action on hold after a specific number of outcomes are recorded for some or all channels. For example, an action can be suppressed for a customer for seven days after the customer has seen an ad for that action five times. Suppressing or pausing an action prevents over-exposure by limiting the number of times a customer is exposed to the same action.

Use **Engagement policies** to define when specific actions or groups of actions are appropriate for customers.



There are four types of engagement policies:

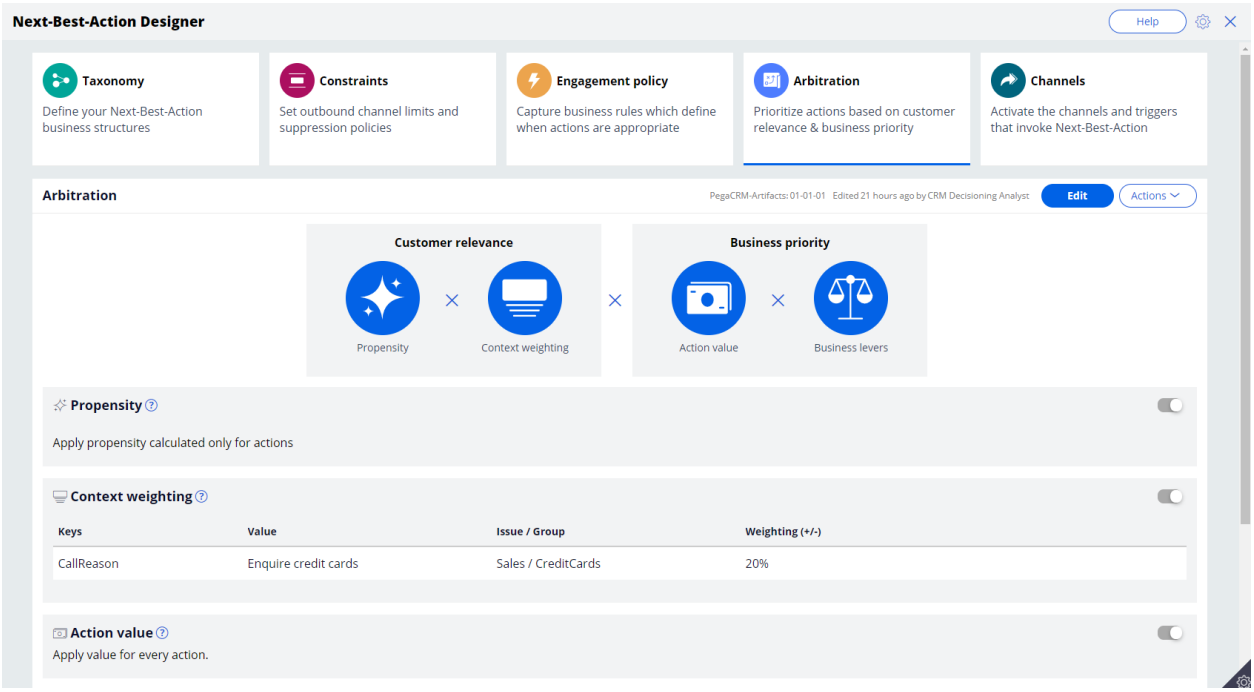
Eligibility determines whether or not a customer qualifies for an action or group of actions. For example, an action may only be available for customers over a specific age or living in a specific geographic location.

Applicability determines if an action or group of actions is relevant for a customer at a particular point in time. For example, a discount on a specific credit card may not be relevant for a customer who already owns a card.

Suitability determines if an action or group of actions is appropriate for a customer for ethical or empathetic reasons. For example, a new loan offer may not be appropriate for a customer whose credit score is low, even though it might be profitable for the bank.

Contact Policies determine when an action or group of actions should be suppressed and for how long. For example, you can suppress an action after a specific number of promotional messages has been sent to customers. To activate Contact Policy rules created in the library on the Constraints tab, add them to the Engagement Policy tab.

Arbitration determines how the Customer Decision Hub prioritizes the list of eligible and appropriate actions that come out of each group.



The factors weighed in arbitration are: Propensity, Context weighting, Action value, and Business levers, each represented by numerical values. A simple formula is used to arrive at a prioritization value, which is used to select the top actions.

Propensity is the likelihood of a customer responding positively to an action. This is calculated by Artificial Intelligence (AI). For example, a click on an offer banner or an accept of an offer in the contact center are considered positive behaviors.

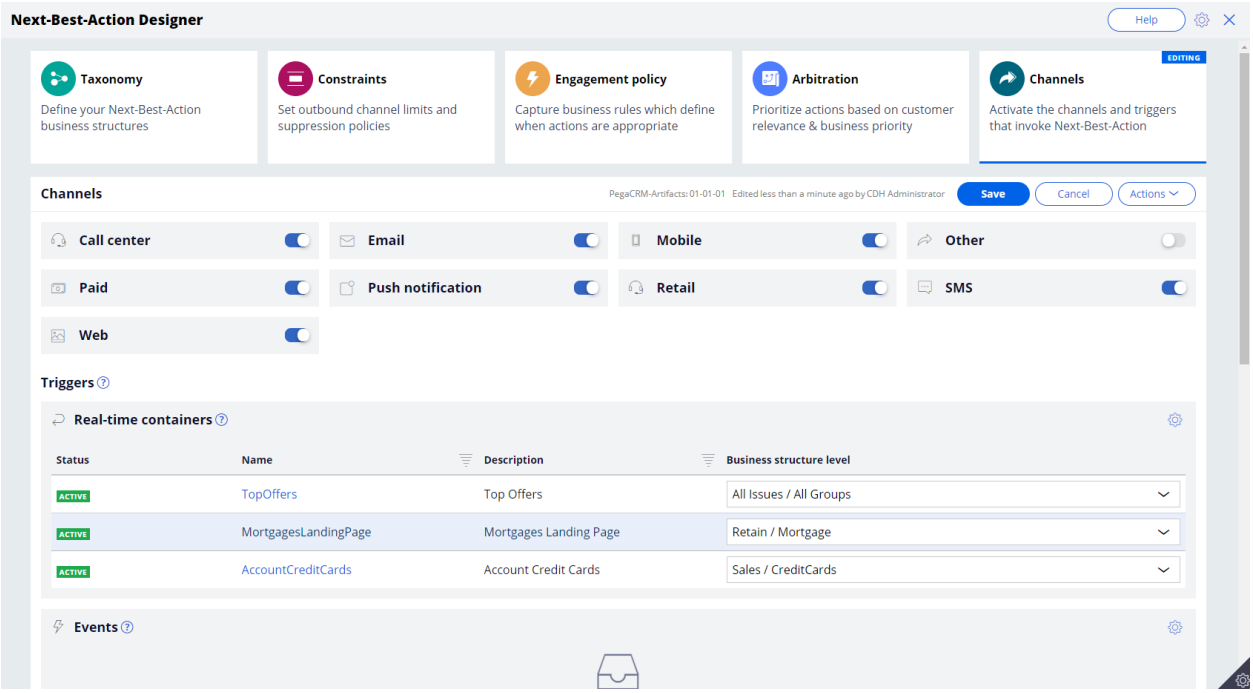
Real-time contextual data is an important part of making highly relevant recommendations**.** **Context weighting** allows you to assign weighting to a specific context value for all actions within an Issue or Group. For example, if a customer contacts the bank to change their address, the weight of the Service context will increase, and the highest priority action will be to ensure that the relevant service is delivered to the customer.

Action value enables you to assign a financial value to an action and prioritize high-value actions over low-value ones. For example, promoting an unlimited data plan might be more

profitable for the company than a limited data plan. Action values are typically normalized across Issues and Groups.

Business levers enable you to accommodate ad hoc business priorities by specifying a weight for an action or Group of actions and/or its associated Business Issue.

Next-Best-Action Designer enables Next-Best-Actions to be delivered via inbound, outbound and paid channels.



These channels can be toggled on or off. If a channel is toggled off, the Next-Best-Actions will not be delivered to that channel.

An external real-time channel is any channel that presents actions selected by the Customer Decision Hub to a customer. These channels can include a website, or a call-center or mobile application. A real-time container is a placeholder for content in an external real-time channel.

A trigger is a mechanism whereby an external channel invokes the execution of a Next-Best-Action decisioning process for specific Issues and Groups. The result will be delivered back to the invoking channel. For example, when a real-time container called “Mortgages Landing Page” is configured, the website invokes this real-time container before loading the mortgage page.

As you have seen in this video, Next-Best-Action Designer is organized according to the high-level sequence of steps needed to configure the Next-Best-Action strategy for your organization. These steps involve:

- Defining the business structure for your organization
- Implementing the channel limits and constraints
- Defining the rules that control which actions are offered to which customers
- Configuring how actions are prioritized
- Configuring when and where Next-Best-Action is triggered

Next best action in an omnichannel environment

Description

Pega's omni-channel AI delivers the right action at every customer touch by crunching millions of data points in real-time.

Learn how you can use Next-Best-Action to ensure a customer service representative takes relevant actions at every step during a customer interaction. Learn how easy it is to configure the brain by using the Next-Best-Action Designer to select the right offer for the right customer on a digital channel.

Learning Objectives

- Explain the benefits of Next-Best-Action in a contact-center
- Explain how adaptive models are used to predict customer behavior
- Describe the cross-sell on the web use case
- Explain the purpose of key configurations in the Next-Best-Action Designer

Next best action in a contact center

Introduction

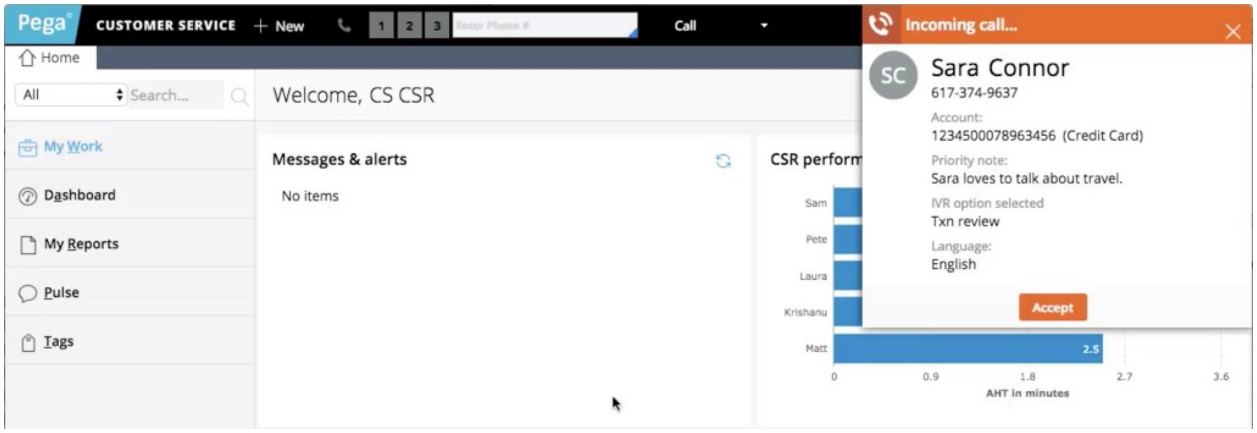
The Customer Decision Hub is an “always on” centralized decisioning “brain” that calculates a 1-to-1 business case for every Next-Best-Action recommendation. To create the business case, the Customer Decision Hub combines customer profile with previous interaction results, the current call context, business rules, and then applies predictive analytics.

Transcript

Next-Best-Action is used to ensure a customer service representative takes relevant actions at every step during a customer interaction.

In this scenario, U+ is a retail bank that uses Pega Customer Service in its contact center.

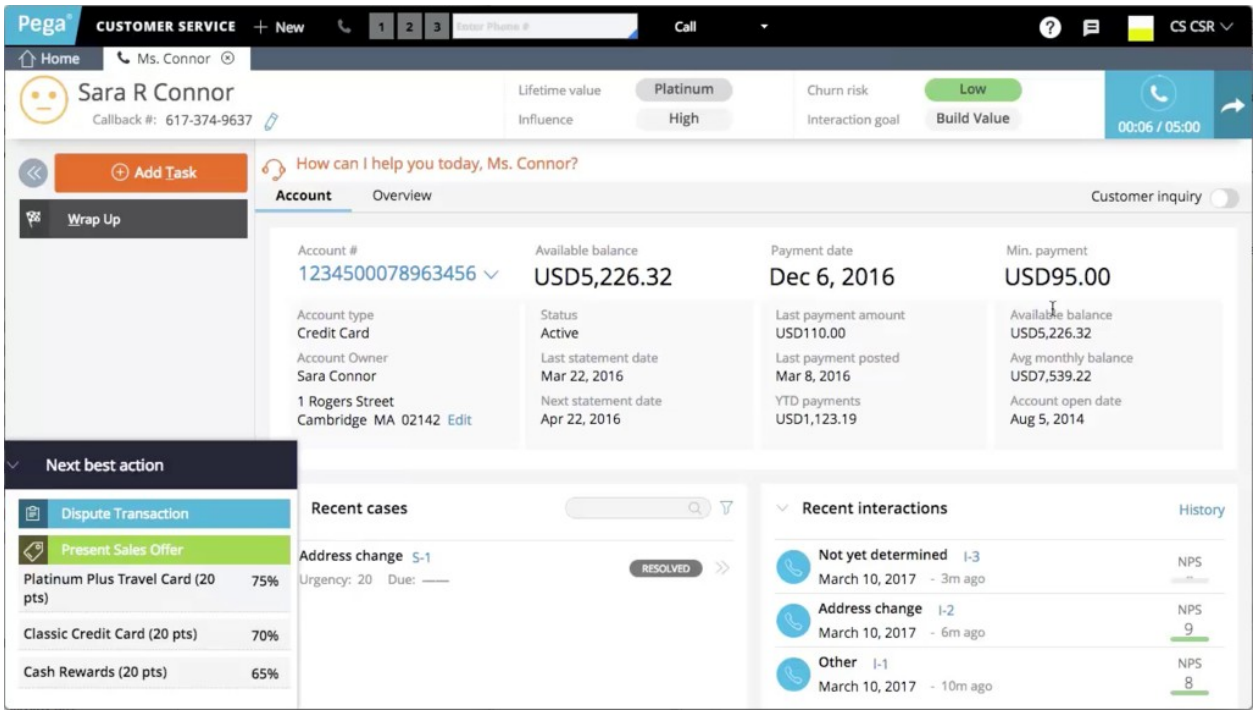
A call comes in to the U+ service center from Sara Connor, a U+ customer. The call is immediately routed to a service representative.



The call details from the IVR system indicate that Sara would like to discuss recent credit card transactions.

Once the service representative accepts the call, all relevant details about Sara are visible on screen.

Next-Best-Action then guides the representative to take the next step with Sara.

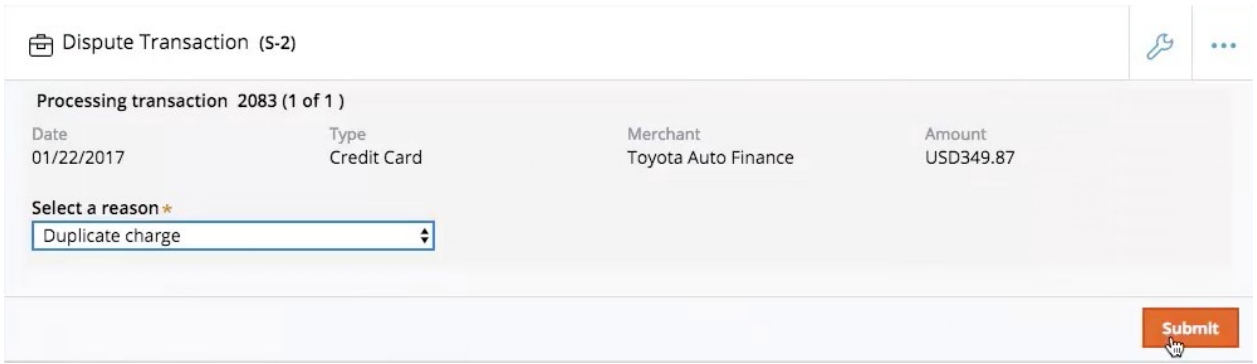


In the lower left corner of the screen you can see the Next-Best-Action that has been recommended to the agent by the Customer Decision Hub.

The Customer Decision Hub is an “always on” centralized decisioning “brain” that calculates a 1-to-1 business case for every Next-Best-Action recommendation. To create the business case, the Customer Decision Hub combines customer profile with previous interaction results, the current call context, business rules, and then applies predictive analytics.

The Customer Decision Hub re-evaluates the Next-Best-Action and delivers a new recommendation when any new information becomes available. For example, when the customer responds to the recommended action.

In this case, the recommended action is to start a service task to handle Sarah’s transaction dispute. So the service representative carries out the task. But the representative is always in control and can select other service actions as appropriate during the conversation.



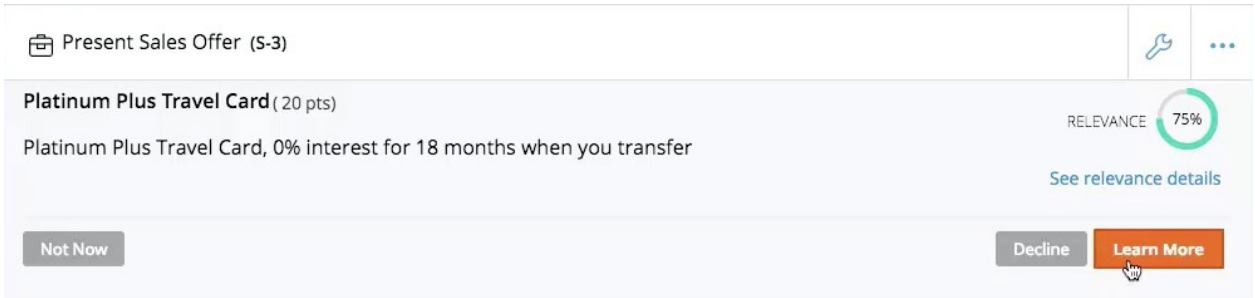
Once the service representative completes the task, the Next-Best-Action is refreshed to show the next recommended action, which is to present a sales offer.

The Customer Decision Hub has analyzed Sara's credit card usage patterns, which indicate that she is a frequent traveler.

As a frequent traveler she often pays a large amount in foreign currency transaction fees. So the highest recommendation is for a Platinum Plus Travel Card, which has no foreign currency transaction fees.

The percentages to the right are scores that are used to rank all relevant offers. The scores are calculated by balancing what the bank would like to promote with what Sara is likely to be interested in.

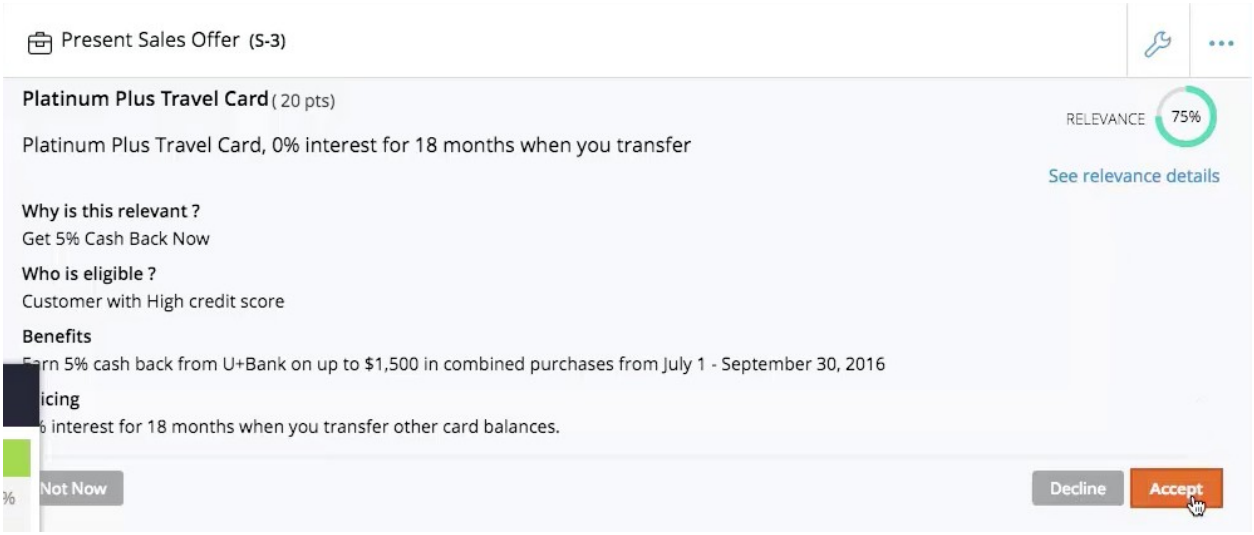
The representative can view more details about the recommended offer so he can further discuss its benefits with Sara.



In this case, Sara is interested in knowing more.

After learning about the benefits of the offer, Sara is indeed convinced that it's a good offer for her, and she decides to accept it.

When the representative clicks Accept, the customer response is recorded in the Interaction History.



This new information is used by the Customer Decision Hub to make the next recommendation.

Notice that the Next-Best-Action is now refreshed.

The Platinum Plus Travel Card and all other credit card offers have been removed from the list.

To summarize, the always on, centralized Customer Decision Hub combines customer and contextual information with business rules and analytics to recommend the Next-Best-Action in real-time.

The Next-Best-Action is re-evaluated when new information becomes available.

Next best action on digital

Introduction

Leverage a website as a marketing channel to improve one-to-one customer engagement, drive sales, and deliver Next-Best-Actions in real-time. Use the Pega Customer Decision Hub™ to recommend more relevant banner ads to customers when they visit their personal portal.

Transcript

This video describes a typical cross-selling use case on the web channel.

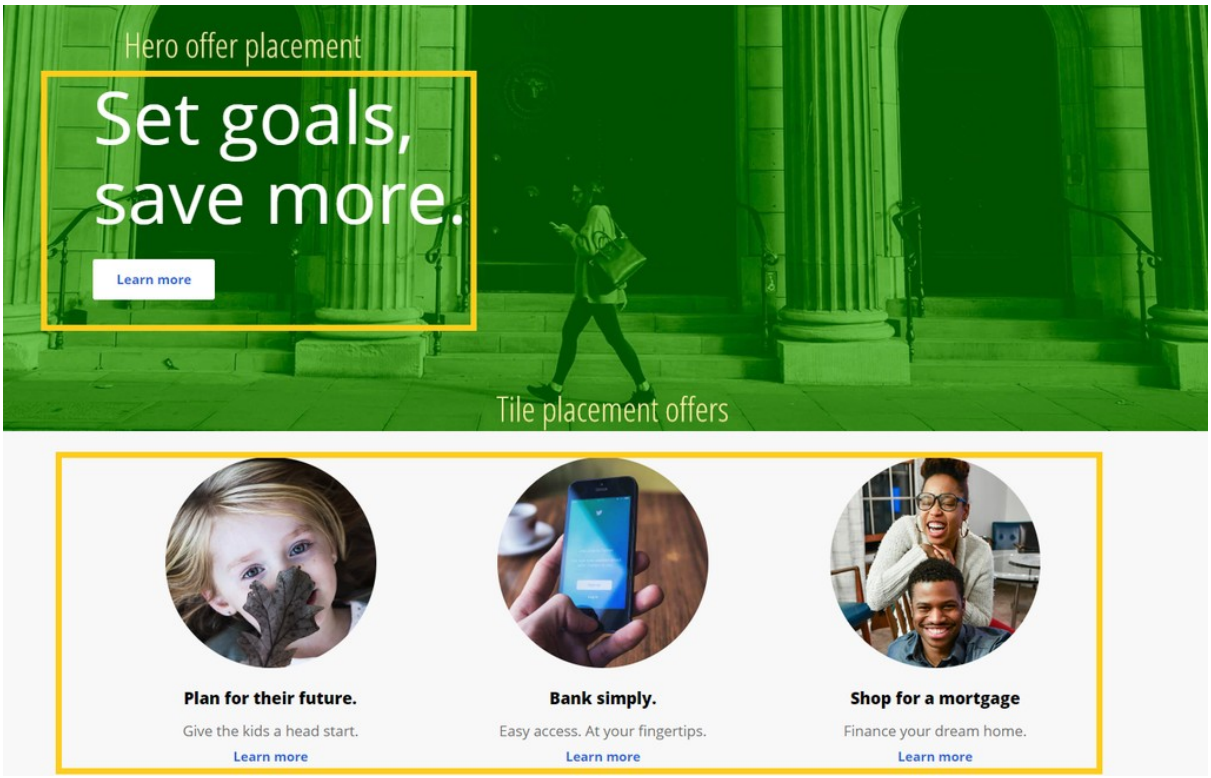
U+ is a retail bank. The bank would like to leverage its website as a marketing channel to improve 1-to-1 customer engagement, drive sales, and deliver Next-Best-Actions in real-time.

The bank has decided to use the Pega Customer Decision Hub™ to recommend more relevant banner ads to its customers when they visit their personal portal.

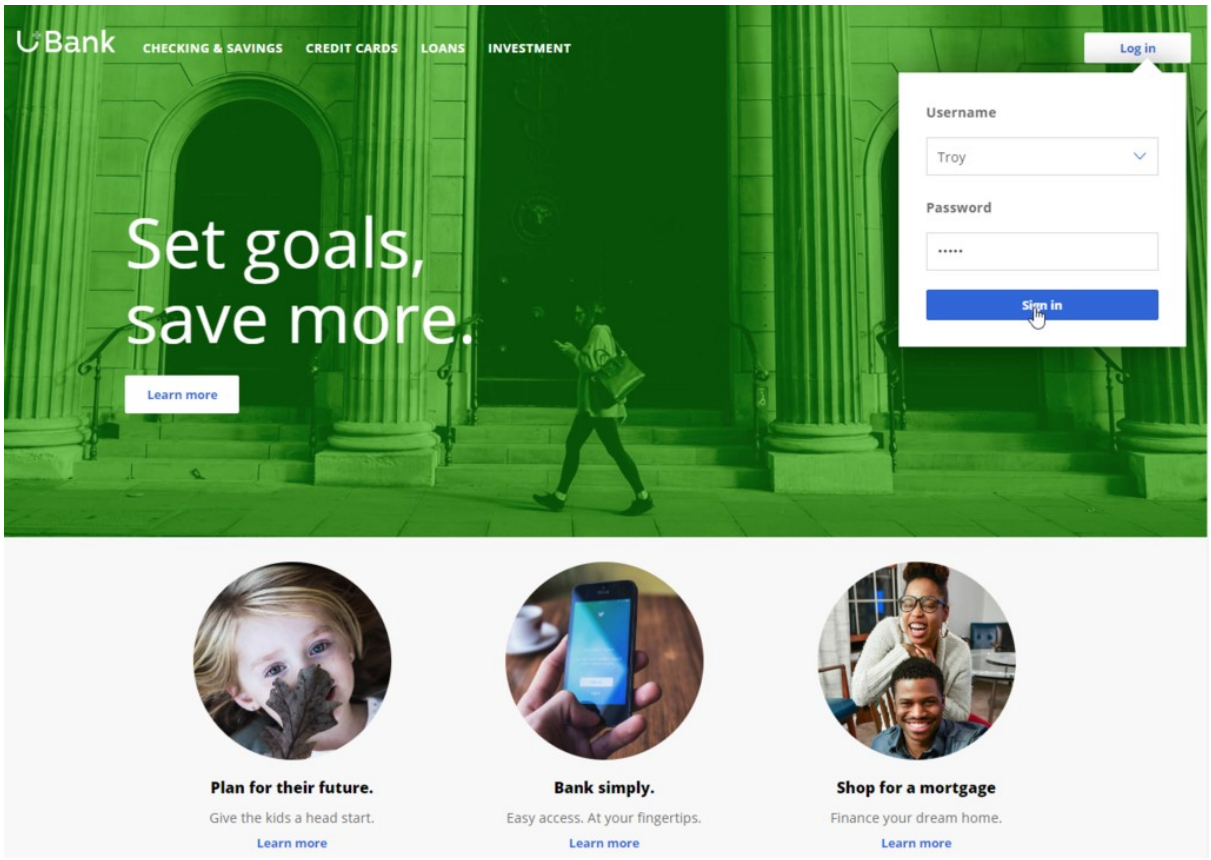
Banner ads are shown on various pages throughout the website.

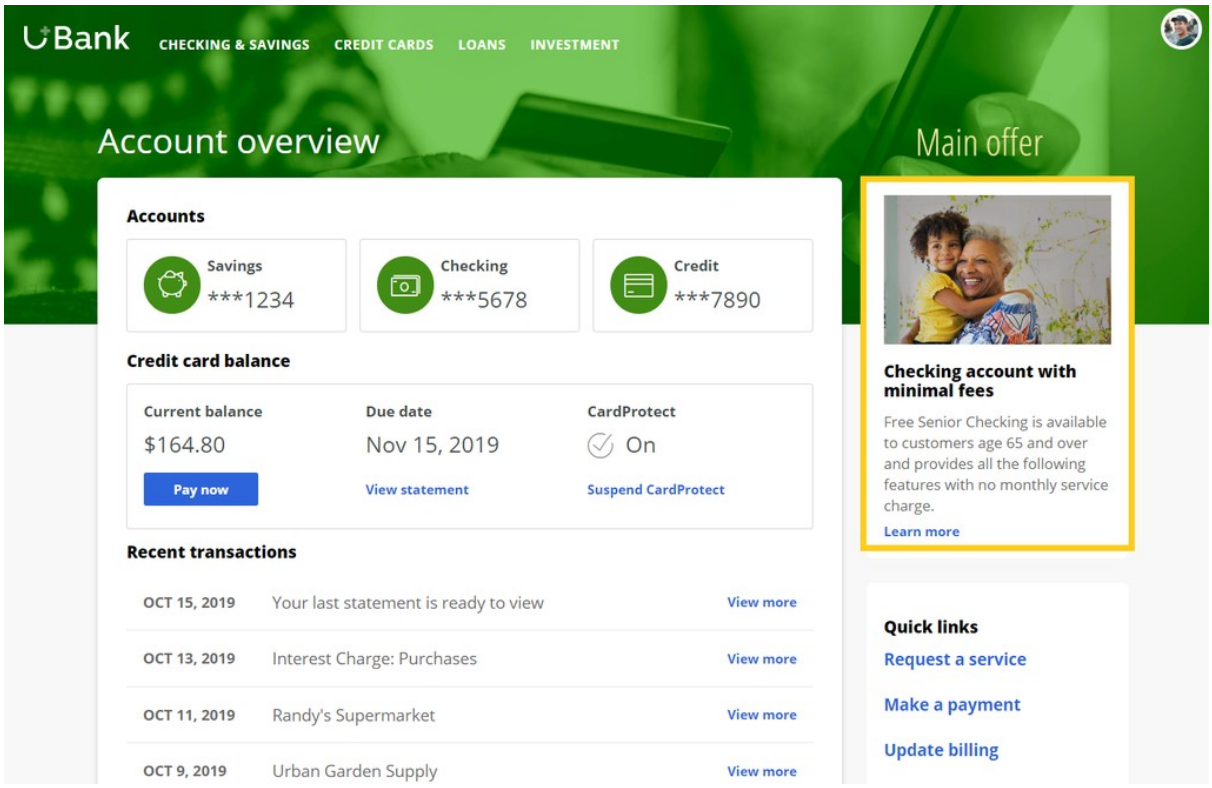
For example, on the home page, U+ can display a Hero banner at the top of the page, which is typically a larger image with bigger typeface.

Below that, there is space to display several Tile banners, which are typically smaller.

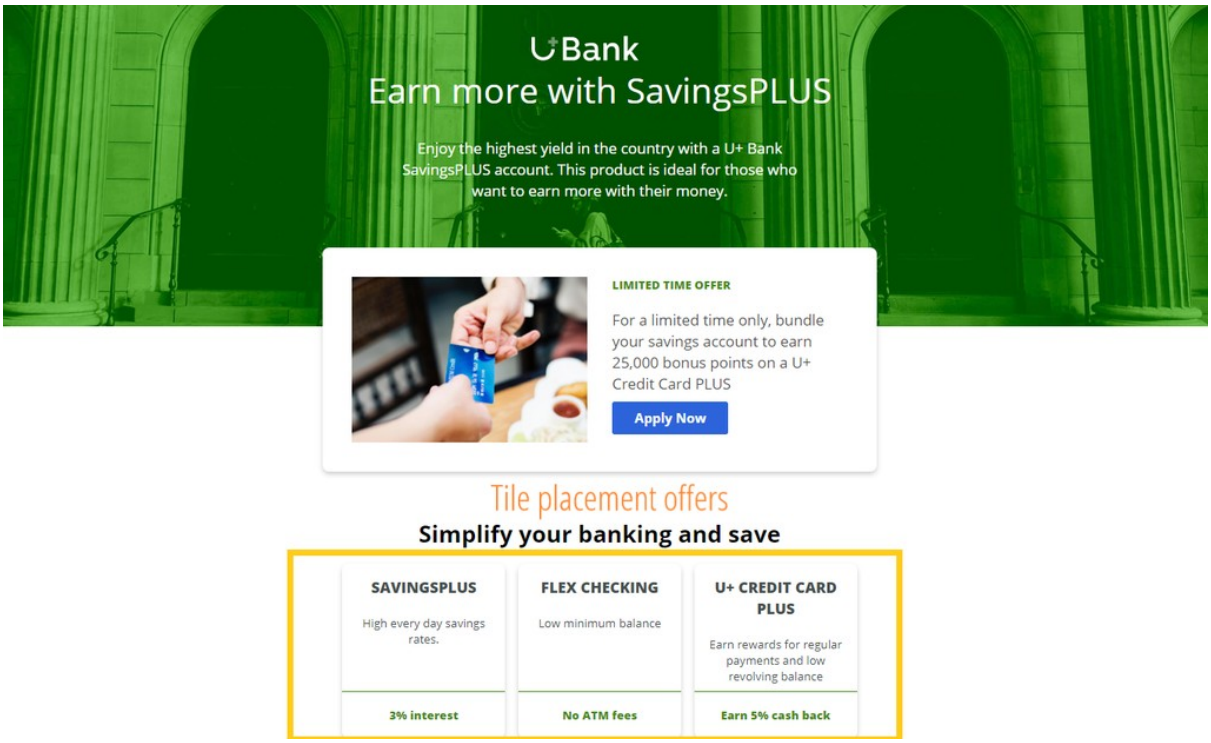


When customers log in to their personal portal, they also see a Tile banner on the **Account overview** page.


Bank
CHECKING & SAVINGS
CREDIT CARDS
LOANS
INVESTMENT
Log in
Username
Troy
Password
Sign in
Set goals, save more.
Learn more
Plan for their future.
Give the kids a head start.
Learn more
Bank simply.
Easy access. At your fingertips.
Learn more
Shop for a mortgage
Finance your dream home.
Learn more


Bank
CHECKING & SAVINGS
CREDIT CARDS
LOANS
INVESTMENT
Account overview
Accounts
Savings
***1234
Checking
***5678
Credit
***7890
Credit card balance
Current balance
$164.80
Pay now
Due date
Nov 15, 2019
View statement
CardProtect
On
Suspend CardProtect
Recent transactions
OCT 15, 2019
Your last statement is ready to view
View more
OCT 13, 2019
Interest Charge: Purchases
View more
OCT 11, 2019
Randy's Supermarket
View more
OCT 9, 2019
Urban Garden Supply
View more
Main offer
Checking account with minimal fees
Free Senior Checking is available to customers age 65 and over and provides all the following features with no monthly service charge.
Learn more
Quick links
Request a service
Make a payment
Update billing

The main intent of U+ at this stage is to increase their web engagement. This can be measured by click-through rate. A Click-through is recorded when the customer clicks on the **Learn more** link.



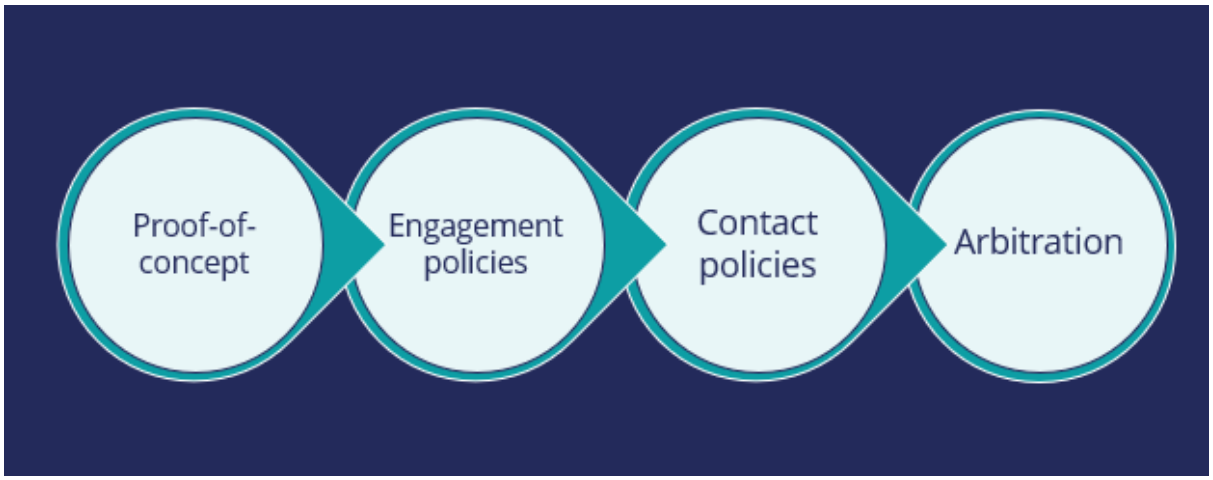
The bank would like to use these banners on the **Account overview** page, to display offers that are more relevant and likely to receive a positive response.

The offers will be selected by a combination of artificial intelligence (AI) and other business rules. The AI and business rules are defined in the Pega Customer Decision Hub.

The Pega Customer Decision Hub is the always-on customer brain that acts as a single, centralized decision authority. The always-on customer brain selects the right offer to be displayed to each customer who visits the bank's website.

Next-Best-Action Designer lets you configure how you want the always-on brain to select the best offer for a customer. The best offer is the result of a series of decisions that are executed in a hierarchical fashion by the brain.

The bank plans to implement the requirement in multiple phases.



The first phase is a proof-of-concept phase. In this phase, the goal is to display a credit card offer on the U+ website. This requires getting the basic environment up and running, setting up the business structure, defining an Action and a Treatment, and enabling channels and triggers for Next-Best-Action.

As a result of this phase, a credit card offer will be displayed on the **Account overview** page to all customers who visit the U+ web site. For example, if customer Troy logs in to his account, the **Cash back** offer is displayed. If another user logs in, they will see the same offer. However, in practice, more offers should be displayed. Also, not all offers may be available to a customer for various reasons.

The next phase is to add customer engagement policies. Engagement policies are the set of conditions such as eligibility, applicability, and suitability that qualify an offer, or a group of offers for a customer. As a result of engagement rules, customers will see only those offers that the organization believes they should be exposed to. For example, Troy logs in, he sees the Rewards Card, but for Barbara this is not applicable, so it will never appear; instead, she sees the Rewards Plus Card.

Too many contact attempts over a short period of time can have a negative impact on a customer's attitude toward further offers by your company. Therefore, in the next phase, U+ implements some contact policies using suppression rules, which allow an offer to be put on hold after a specific number of outcomes. For example, if Troy ignores an ad a few times, then the ad will no longer be shown to him over a period of time. Instead, his **Account overview** page will show a different ad.

Basically, from a set of all available offers, the choice is narrowed down by engagement policies. Then the selection is further narrowed down by suppression rules.

After the engagement policies and suppression rules have “whittled down” the total possible offers to a few, Arbitration is used to choose the top offer based on what is relevant for the customer right NOW.

Arbitration is the last phase of cross-sell in the U+ web use case.

Arbitration aims at balancing customer relevance with business priorities. Specifically, Propensity, Context Weighting, Action Value, and Business Levers are given numerical values. A simple formula is then used to arrive at a prioritization value, which is used to select the top offer. For example, Troy qualifies for three credit card offers. When he logs in, he sees the top offer for him, the Standard Card. This offer is the Top 1 because the priority value is the highest among all other offers.

Arbitrating between actions

Description

After applying engagement policy rules, a customer may still qualify for more than one action. Learn how every Next-Best-Action weighs customer needs against business objectives to optimize decisions based on priorities set by the business.

Learning Objectives

- Describe what action arbitration is and how it works
- Explain how customer needs and business objectives are considered during arbitration
- Prioritize actions based on AI
- Prioritize actions based on AI & business levers

Action arbitration

Introduction

Pega Customer Decision Hub combines analytics, business rules, customer data, and data collected during each customer interaction to create a set of actionable insights that it uses to make intelligent decisions. Arbitration aims to balance customer relevance with business priorities by weighing numerical values for the following factors: propensity, context weighting, action value, and business levers. Learn to create a simple formula for arriving at a prioritization value, which is used to select the top actions.

Transcript

This video explains the concept of action arbitration.

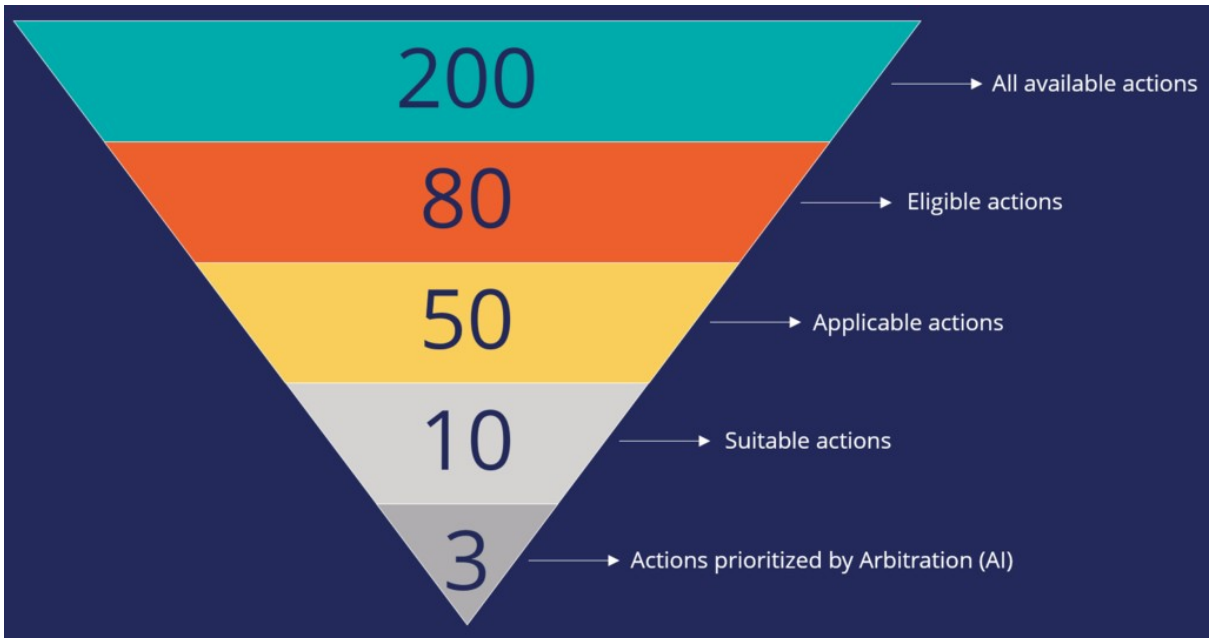
Pega Customer Decision Hub™ combines analytics, business rules, customer data, and data collected during each customer interaction to create a set of actionable insights that it uses to make intelligent decisions. These decisions are known as Next-Best-Action.

Every Next-Best-Action weighs customer needs against business objectives to optimize decisions based on priorities set by the business manager.

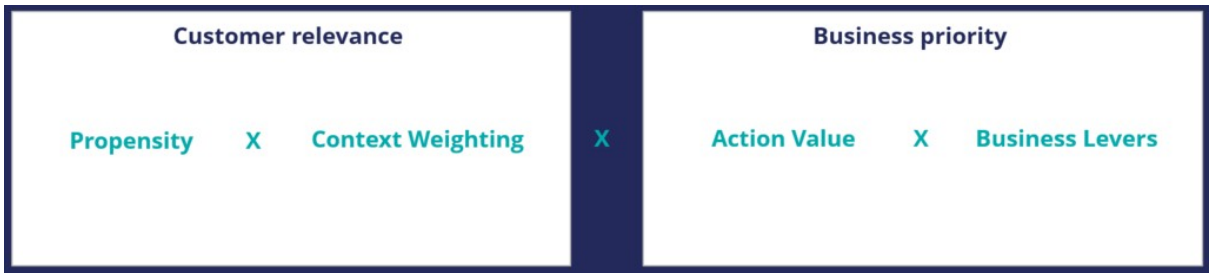
U+ Bank, a retail bank, has several actions for its customers and has configured engagement policies to suit both customer needs and business objectives.

In this scenario, a marketer for U+ has designed 200 actions that can be presented to customers. To select the Next-Best-Actions from these, Pega Customer Decision Hub first checks the eligibility conditions and filters the actions. Then, the applicability conditions are run to filter it further. Next, Customer Decision Hub checks the suitability conditions to derive the final set of available actions.

These actions move through one final stage before being presented to customers: the arbitration stage. Arbitration is used to prioritize and choose the best actions based on what is relevant for the customer right now.



Arbitration aims to balance customer relevance with business priorities. The factors weighed are **Propensity**, **Context Weighting**, **Action Value**, and **Business Levers**, each represented by numerical values. A simple formula is used to arrive at a prioritization value, which is used to select the top actions. The number of top actions selected depends on the channel of interaction. For example, the top three actions, plus two tiles and one hero treatment, can be selected for display on a bank's website.



Propensity is the likelihood of a customer responding positively to an action; this is calculated by AI. For example, the higher the likelihood of a customer accepting an offer, the higher the Propensity value for that offer.

Context Weighting allows Pega Customer Decision Hub to consider the situational context for each action. For example, if a customer contacts the bank to close their account, the highest-priority action is to ensure that the customer is retained. The priority of an action is increased by a specified value when the context is detected.

Action Value enables you to assign a financial value to an action and prioritize high-value actions over low-value ones. This value is typically normalized across Issues and Groups. For example, an unlimited data plan is more profitable than a limited data plan. So, in a situation where a customer is eligible for both plans, the unlimited plan has higher priority.

Business Levers allow the business to assert some level of control over the prioritization of actions defined within the system. Levers are used to manually nudge Customer Decision Hub toward Next-Best-Actions based on external factors. For example, the recommended Next- Best-Action might be to offer a credit card to a customer when they visit the home page. But to meet a business goal, the Mortgage Line of Business favors a mortgage offer even if that offer is ranked a little lower on the list of possible actions.

Consider an example where three actions are selected for arbitration. At the moment, only the Propensity is used for prioritization.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
	Sales	Credit cards	Gold Card	0.5	1	1	1	0.5
	Retention	Proactive	10% discount	0.55	1	1	1	0.55
	Service	Administrative	Address change	0.4	1	1	1	0.4

Action arbitration with propensity before prioritization

The result of the arbitration is that the top action is the one with the highest Propensity.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Retention	Proactive	10% discount	0.55	1	1	1	0.55
2	Sales	Credit cards	Gold Card	0.5	1	1	1	0.5
3	Service	Administrative	Address change	0.4	1	1	1	0.4

Action arbitration with propensity after prioritization

Examine what happens when Context Weighting together with Propensity are considered for arbitration. For example, if the intent of a customer calling customer service is to change their address, the Context Weight of a Service action increases.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Retention	Proactive	10% discount	0.55	1	1	1	
2	Sales	Credit cards	Gold Card	0.5	1	1	1	
3	Service	Administrative	Address change	0.4	2	1	1	

Action arbitration with context weight before prioritization

As a result, the Arbitration caters to the current need of the customer and presents a Service action as the top action for the customer. Thus, the Arbitration caters to the current need of the customer and presents a Service action as the top action for the customer.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Service	Administrative	Address change	0.4	2	1	1	0.8
2	Retention	Proactive	10% discount	0.55	1	1	1	0.55
3	Sales	Credit cards	Gold Card	0.5	1	1	1	0.5

Action arbitration with context weight after prioritization

Consider another scenario in which a customer is eligible for two credit cards and two other actions. Now, consider that the Action Value is also used in arbitration when prioritizing. In this case, the Platinum Card is assigned a higher value by the business than the Gold Card.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Sales	Credit cards	Gold Card	0.6	1	1	1	
2	Sales	Credit cards	Platinum Card	0.55	1	2	1	
3	Retention	Proactive	10% discount	0.2	1	1	1	
4	Service	Administrative	Address change	0.1	1	1	1	

Action arbitration with action value before prioritization

Thus, the arbitration selects the Platinum Card as the top action.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Sales	Credit cards	Platinum Card	0.55	1	2	1	1.1
2	Sales	Credit cards	Gold Card	0.6	1	1	1	0.6
3	Retention	Proactive	10% discount	0.2	1	1	1	0.2
4	Service	Administrative	Address change	0.1	1	1	1	0.1

Action arbitration with action value after prioritization

Finally, consider an example in which all four parameters are used for arbitration. In this case, U+ Bank wants to promote two new checking account offers under the Sales issue. The bank sets a higher Business Lever value for the Checking Accounts actions.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Sales	Credit cards	Gold Card	0.6	1	1	1	
2	Sales	Credit cards	Platinum Card	0.55	1	1	1	
3	Sales	Checking Accounts	Premium Checking	0.55	1	1	2	
4	Sales	Checking Accounts	Student Checking	0.5	1	1	2	
5	Retention	Proactive	10% discount	0.2	1	1	1	
6	Service	Administrative	Address change	0.1	1	1	1	

Action arbitration with business levers before prioritization

Although the Propensity of the Checking Accounts actions is low, they are selected as the top actions due to their high Lever values.

Rank	Issues	Groups	Actions	Propensity	Context weighting	Action value	Business levers	Priority
1	Sales	Checking Accounts	Premium Checking	0.55	1	1	2	1.1
2	Sales	Checking Accounts	Student Checking	0.5	1	1	2	1
3	Sales	Credit cards	Gold Card	0.6	1	1	1	0.6
4	Sales	Credit cards	Platinum Card	0.55	1	1	1	0.55
5	Retention	Proactive	10% discount	0.2	1	1	1	0.2
6	Service	Administrative	Address change	0.1	1	1	1	0.1

Action arbitration with business levers after prioritization

Action prioritization with AI

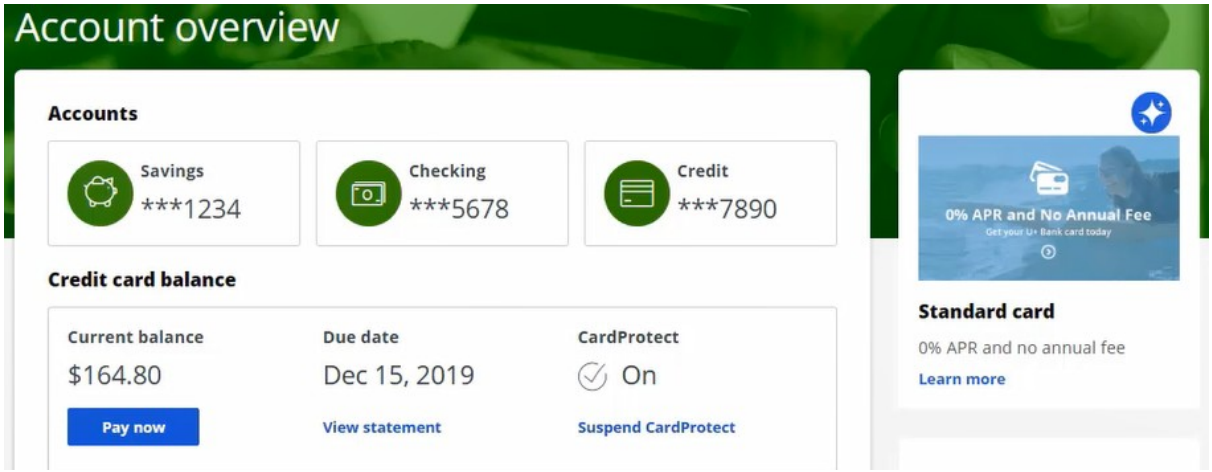
Introduction

Explore how AI-based arbitration works and how AI predicts customer behavior. Arbitration aims to balance customer relevance with business priorities. To select the top actions, a formula is used to arrive at a prioritization value. The formula uses the propensity value, which is calculated using AI. Propensity is the predicted likelihood of positive behavior, such as the likelihood of a customer accepting an offer.

Transcript

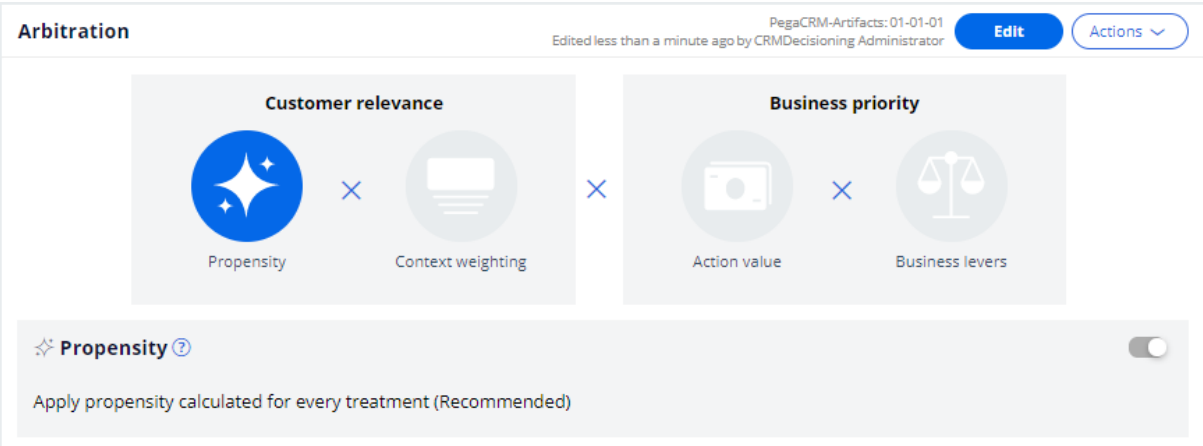
This video will explore how AI-based arbitration works and explain how AI predicts customer behavior.

U+, a retail bank, uses the Pega Customer Decision Hub™, to display marketing offers to customers on its website. The bank would like to display more relevant offers to customers based on their behavior.
Troy, a customer, qualifies for two credit card offers. When he logs into the bank's website, he sees the top offer for him, the **Standard Card.**



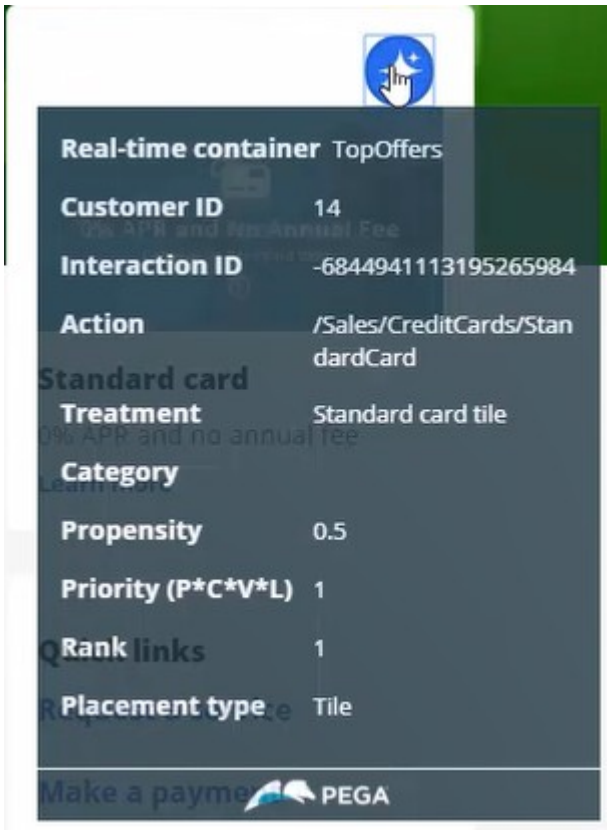
These are the Arbitration settings defined in Pega Customer Decision Hub's Next-Best-Action Designer. Arbitration aims to balance customer relevance with business priorities. To achieve this balance, Propensity (P), Context weighting (C), Action value (V), and Business levers (L) are represented by numerical values and plugged into a simple formula, P * C * V * L. This formula is used to arrive at a prioritization value, which is used to select the top actions.

Notice that only Propensity is currently enabled. Propensity is the predicted likelihood of positive behavior, such as the likelihood of a customer accepting an offer. The value of Propensity is calculated using AI.

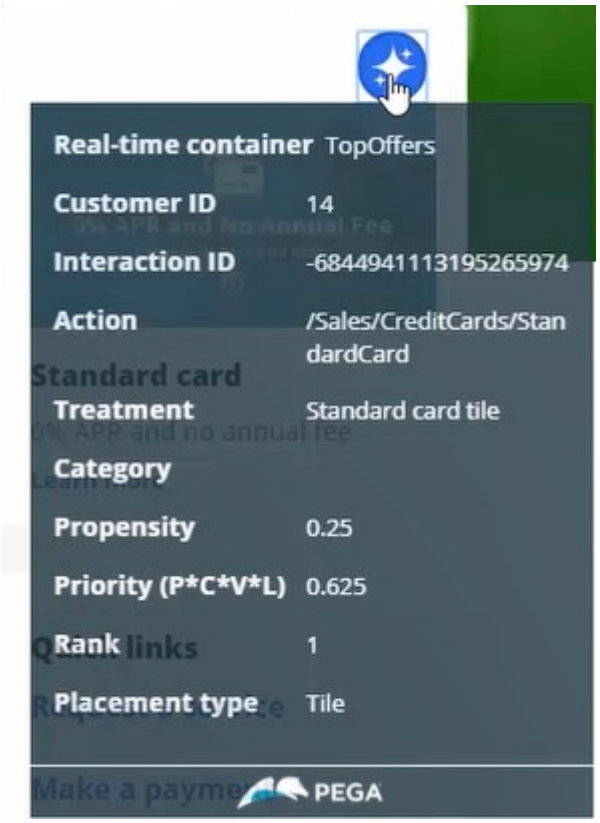


Note the Propensity and Priority values of the **Standard Card**. The Propensity for every action starts at 0.5 or 50%, the same as the flip of a coin. This is because in the beginning, the AI has no past customer behavior on which to base its predictions. Propensity is one of the factors used to arbitrate between relevant offers and select the top offer for a customer.

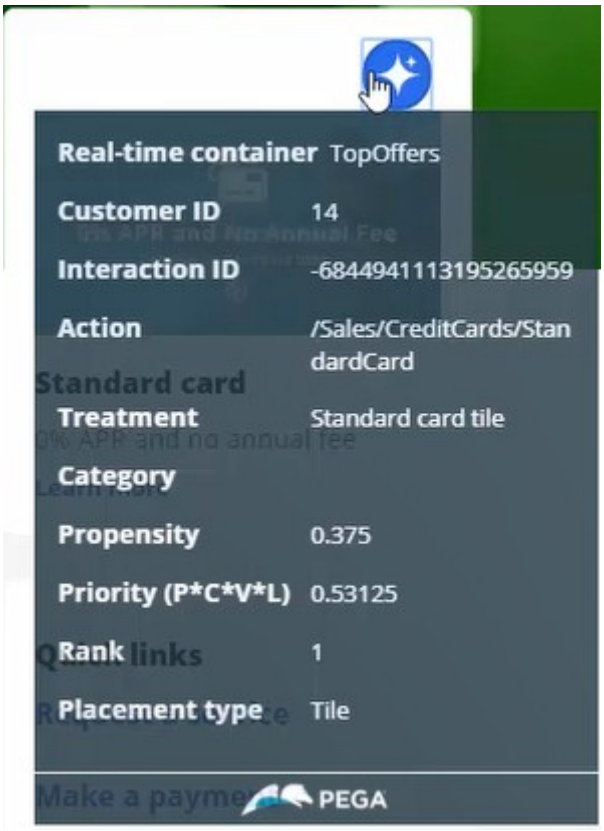
Notice that although only Propensity is enabled for arbitration, the value of Priority, which is currently based on Propensity only, does not match the Propensity value. This is because the Priority calculation doesn't use the raw Propensity value directly. Instead it uses the value resulting from a built-in Propensity smoothing mechanism. The Propensity smoothing mechanism is used to jump-start the process of AI learning. It helps to equalize the sudden changes in Propensity values calculated by AI during the initial phase of its learning, when it has yet to gather enough customer behavior data to make accurate predictions.



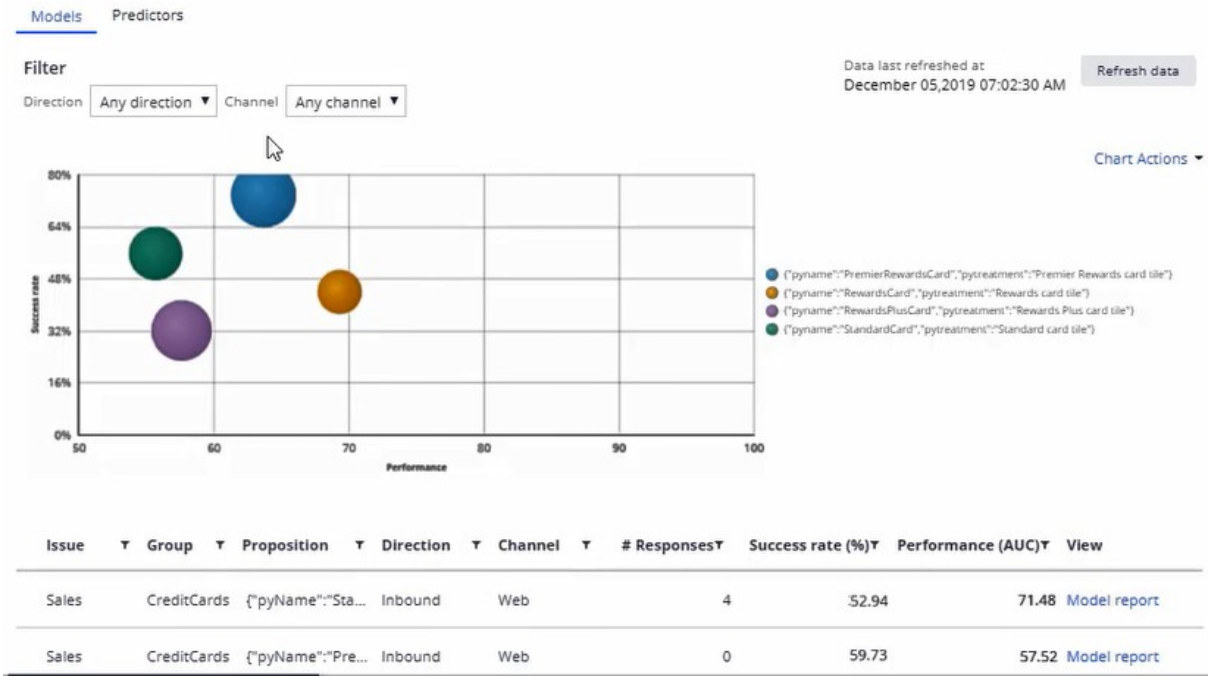
If Troy doesn't click on the current offer this time, a different offer will be shown the next time he visits the website. The next offer Troy is eligible for, the Rewards Card, is then selected for display. If Troy ignores this card as well, by not clicking on it, then the next time he logs in, the Standard Card offer will be displayed again. Why this behavior? First, Troy only qualifies for these two credit card offers. Second, the AI model behind these offers is configured to treat an Impression as a negative behavior. In other words, when a customer is presented with an offer but doesn't click on it, the AI records this as a negative behavior. As a result, the Propensity, and therefore the Priority, of the not-clicked-on offer decreases. Notice that the Propensity value of the **Standard Card** offer dropped from 0.5 to 0.25.



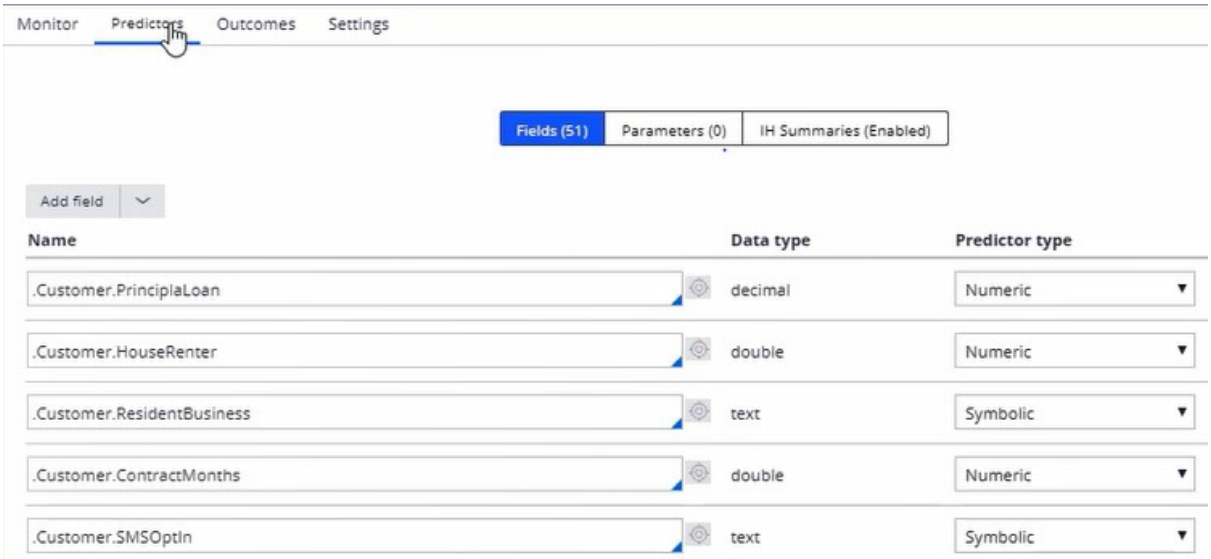
Now, if Troy clicks on the 'Learn more' link for the **Standard Card** offer, a positive response is recorded, and thus the Propensity value of the **Standard Card** increases.



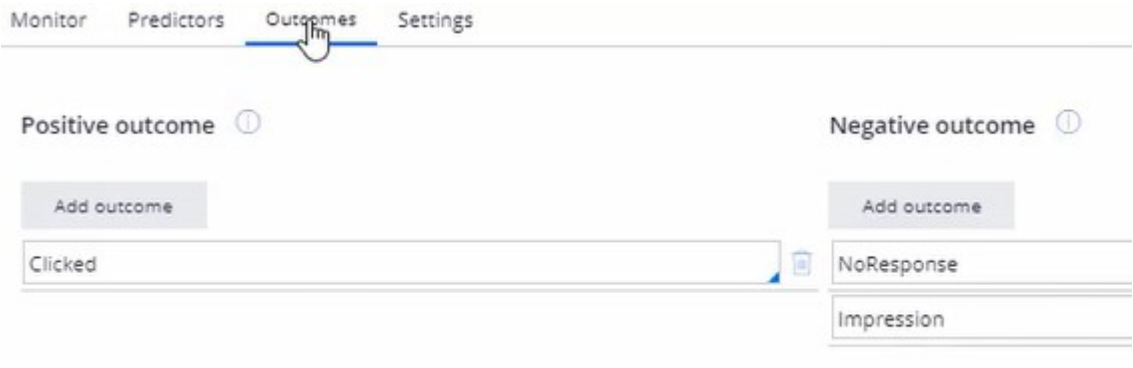
The Customer Decision Hub is configured to calculate the Propensity for each Treatment. To understand how this works, let's examine the AI behind a Treatment. This pop-up window provides a summary of the AI behind this Treatment. In the Pega Customer Decision Hub, the AI that determines the Propensity for positive behavior towards an action or Treatment is called an adaptive model. From here, you can navigate to the adaptive model itself.



An adaptive model is a self-learning predictive model that uses machine learning to calculate Propensity scores. It automatically determines the factors that help in predicting customer behavior. These predictors can include a customer's demographic details, product and service usage, past interactions with the bank, and even contextual information such as the current channel of interaction.



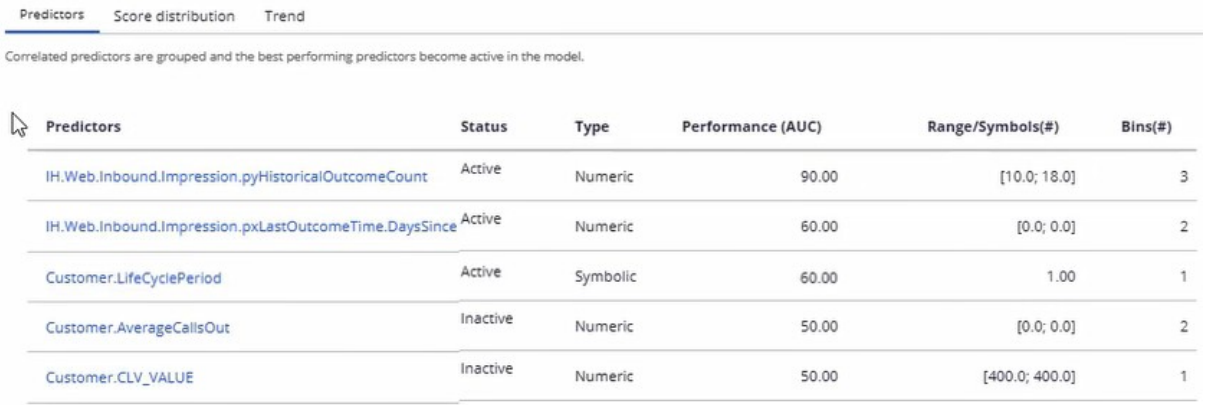
This adaptive model considers an Impression, when a marketing offer is displayed on a website, a negative behavior. It considers a Click a positive behavior.



Therefore, when a customer sees an offer message but doesn't click on it, the model records a negative behavior.

The monitoring tab provides an overview of the model's performance. The business can use this information to assess the contribution of the model's predictions with respect to the success of the actions.

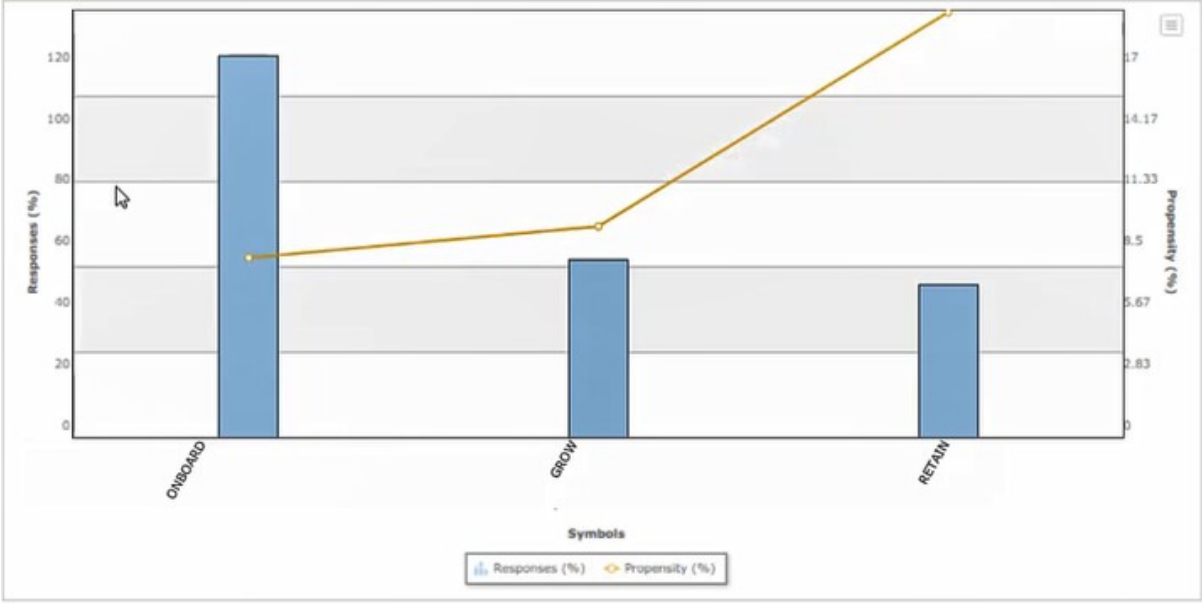
The model report provides more insight into the AI model itself. This AI model is automatically generated by the system, and it adapts its prediction algorithm in real-time, based on incoming customer responses. The report shows more information about the predictors, such as how they are grouped and details a data scientist can use to analyze the current health of the model and diagnose any potential problems.



Predictors	Status	Type	Performance (AUC)	Range/Symbols(#)	Bins(#)
IH.Web.Inbound.Impression.pyHistoricalOutcomeCount	Active	Numeric	90.00	[10.0; 18.0]	3
IH.Web.Inbound.Impression.pxLastOutcomeTime.DaysSince	Active	Numeric	60.00	[0.0; 0.0]	2
Customer.LifeCyclePeriod	Active	Symbolic	60.00	1.00	1
Customer.AverageCallsOut	Inactive	Numeric	50.00	[0.0; 0.0]	2
Customer.CLV_VALUE	Inactive	Numeric	50.00	[400.0; 400.0]	1

In the Predictor report, you can examine the performance of individual predictors. Let's examine the LifeCyclePeriod predictor.

This a predictor of type Symbolic. The individual Predictor report shows that a customer whose lifecycle stage is RETAIN is most likely to accept the Standard Card action in the web channel.



The behavior of one customer can influence the Propensity calculation for other customers with a similar profile. For example, when Robert, a customer with a profile similar to Troy, logs in, he is shown the same offer as Troy. The same AI model is behind the Treatments for both customers, so Robert's action will influence Troy's Propensity score.

Prioritizing actions with business levers

Introduction

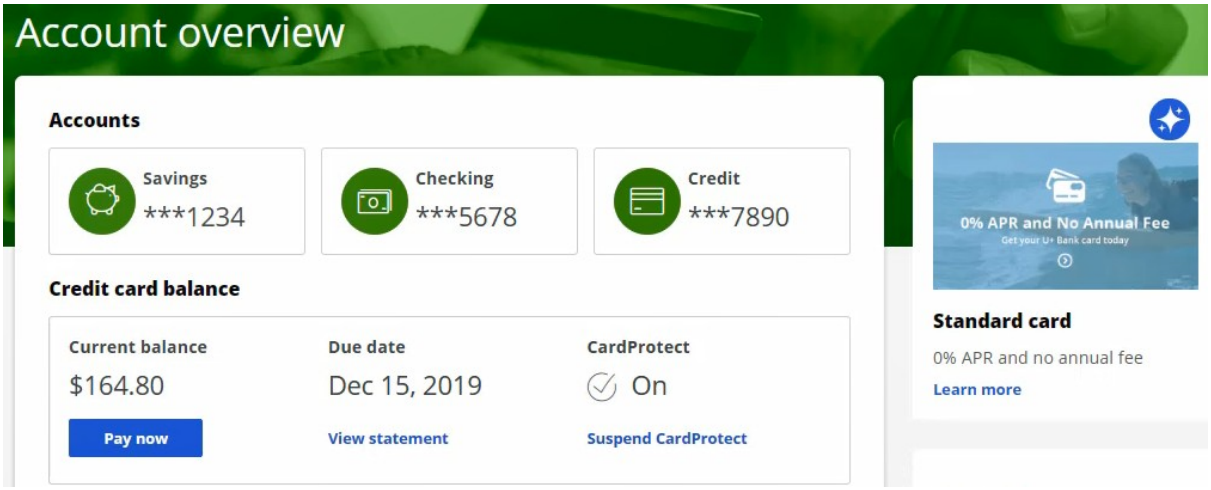
Often, due to an internal ad-hoc priority, the business would like to boost the chance of certain actions being selected. To achieve this, they would like to present more relevant offers to customers based not only on their behavior but also on business priorities. Learn how to include business requirements in an action prioritization calculation to boost the chance of an action being selected.

Transcript

This video will show you how to include business requirements in an action prioritization calculation to boost the chances of an action being selected.

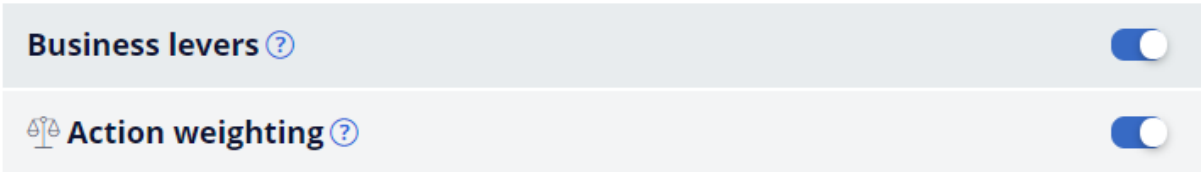
U+, a retail bank, noticed that one of the offers, the Rewards card offer, was not presented frequently enough due to its low propensity because customers ignored it during the initial launch.

For example, Troy, a customer, qualifies for two credit card offers – the Standard Card and the Rewards Card. When he logs in to the bank's website, he sees the top offer for him, Standard Card.

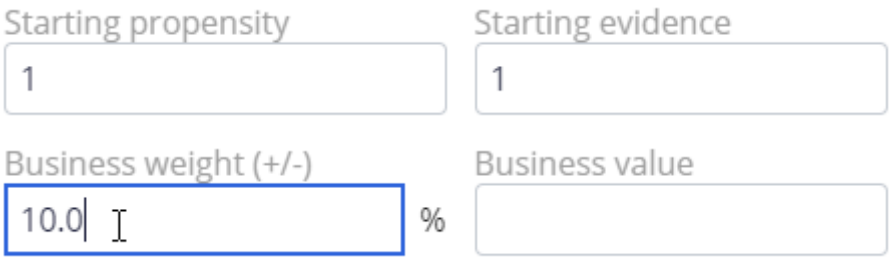


Now, due to an internal ad-hoc priority, the bank wants to boost the chances of the Rewards Card being selected as the top offer. That is, the bank would like to present more relevant offers to customers based on not only their behavior but also on business priorities.

To implement this requirement, you must first enable the Action Weighting, a Business Lever, in Next-Best-Action Designer's Arbitration equation. This ensures that an action's business weight is used in the priority value calculation.



In this case, the bank wants to boost the Rewards Card. So, open the Rewards Card offer. Edit the offer to set a business weight, a value in percentage, that is required to boost the offer. In this case, U+ wants to increase the changes of this action selected by 10%.



Save the offer for the changes to take effect.

Now, when Troy logs into the website, he will see that Rewards card is the top offer.