



Pega Customer Decision Hub Foundation

STUDENT GUIDE

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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

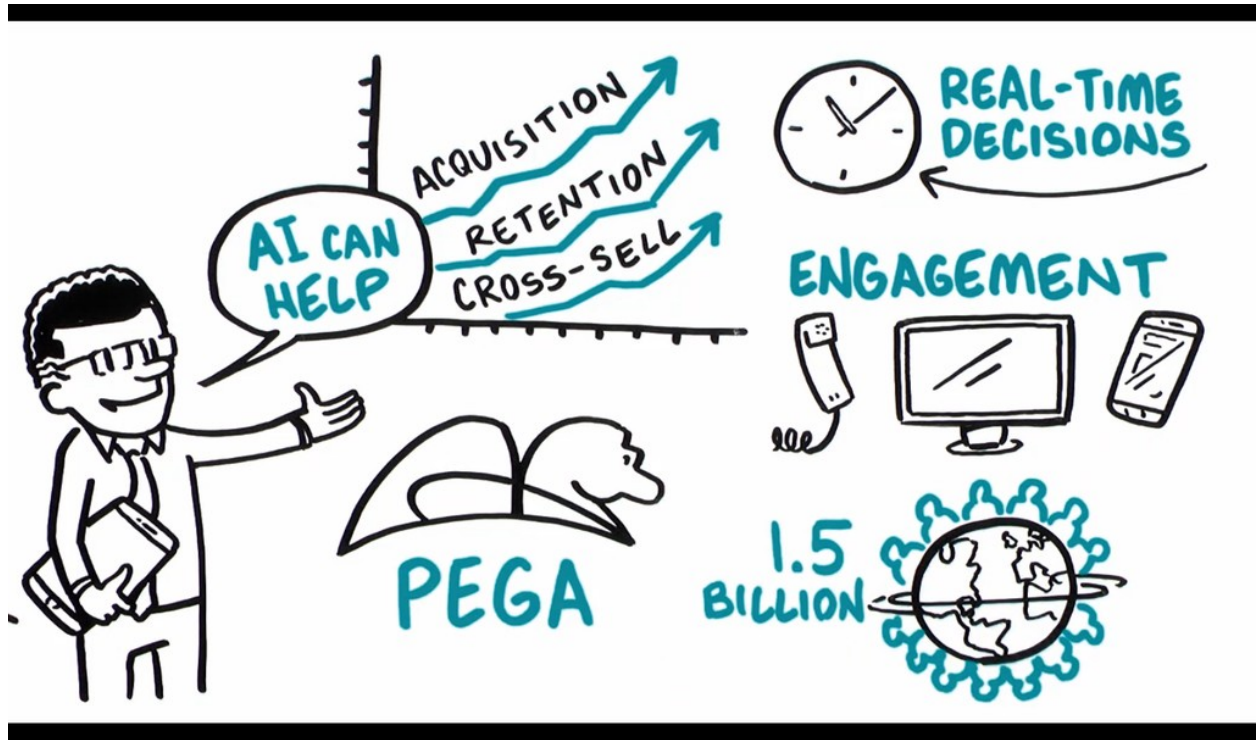
The value of big data and analytics is fully realized when every customer conversation delivers exactly the right message, the right offer, or the right level of service to provide a great experience while maximizing the customer's value to the organization. With Pega Next-Best-Action, business experts 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.



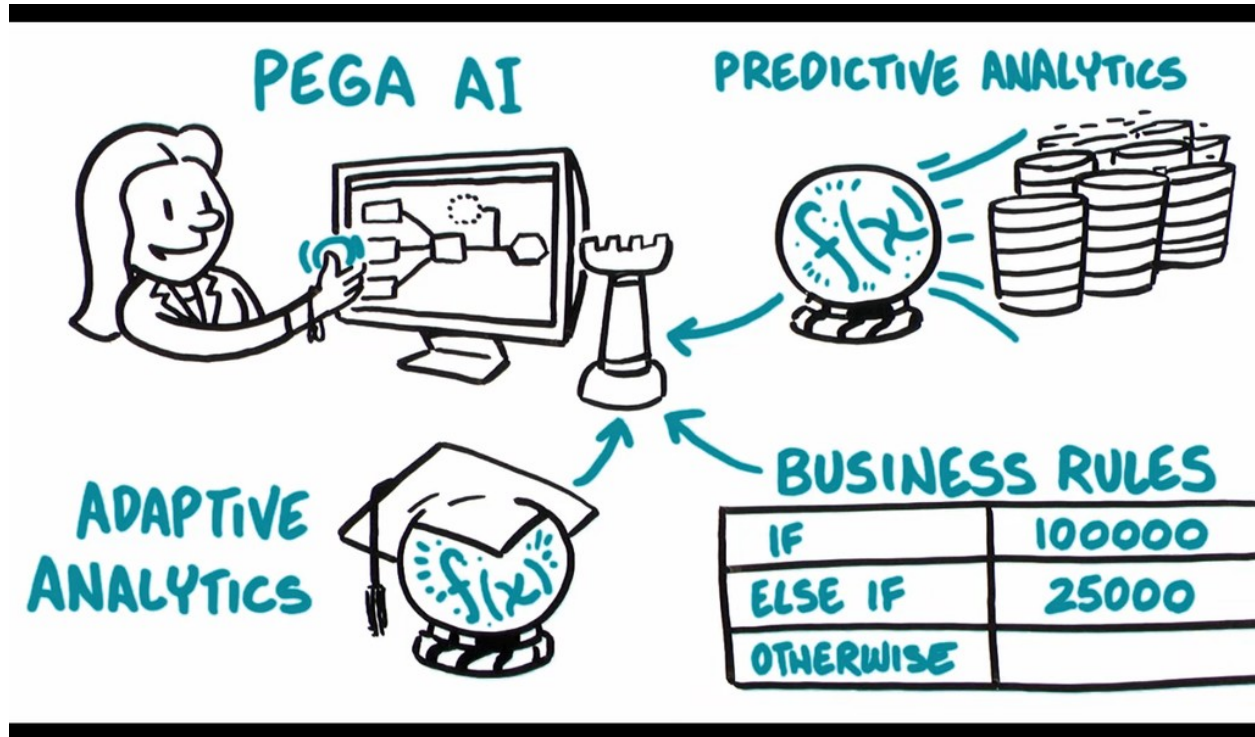
Artificial Intelligence, or AI, can help—if you can get past the hype. Pega has been using AI to create real business value for years, driving real-time decisions that deliver awesome engagement on any channel and improving experiences for over 1.5 billion customers across the globe.



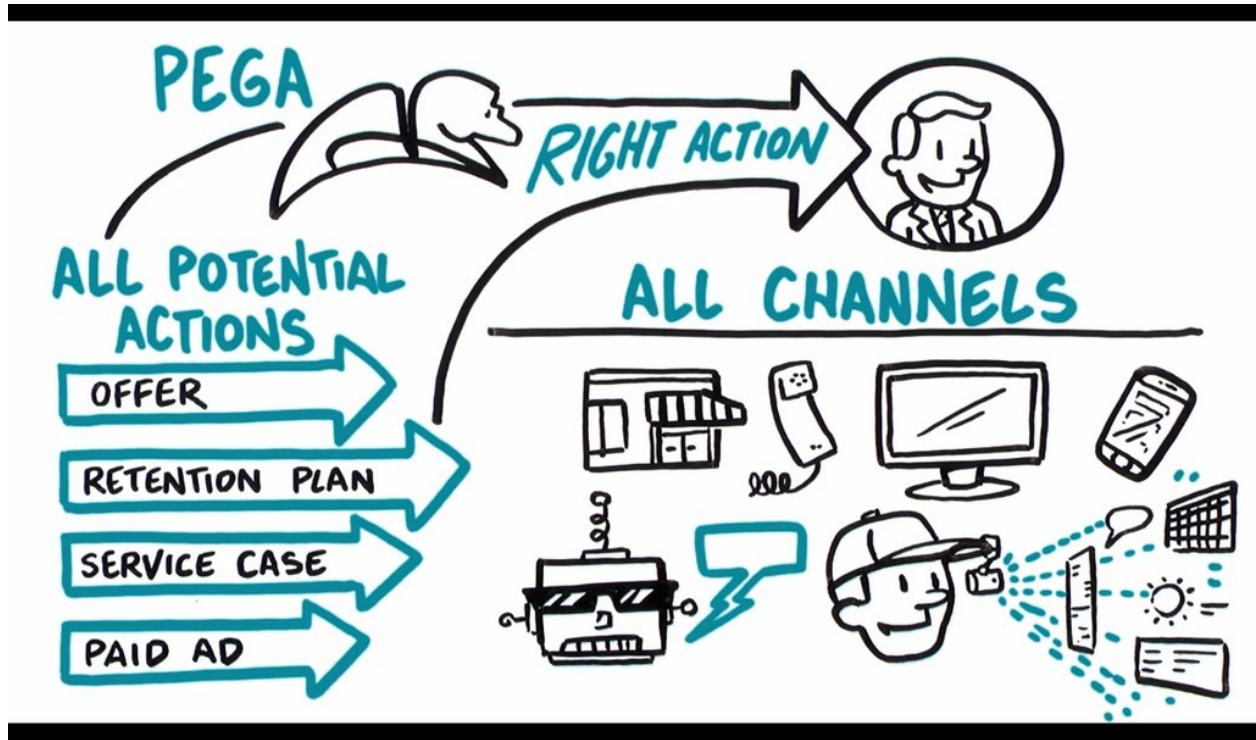
Pega's omni-channel AI delivers the right action at every customer touch by crunching millions of data points in real-time. Make an offer, initiate a retention plan, predict a problem before it happens. Every decision generates the next-best-action for your customer, and your business.



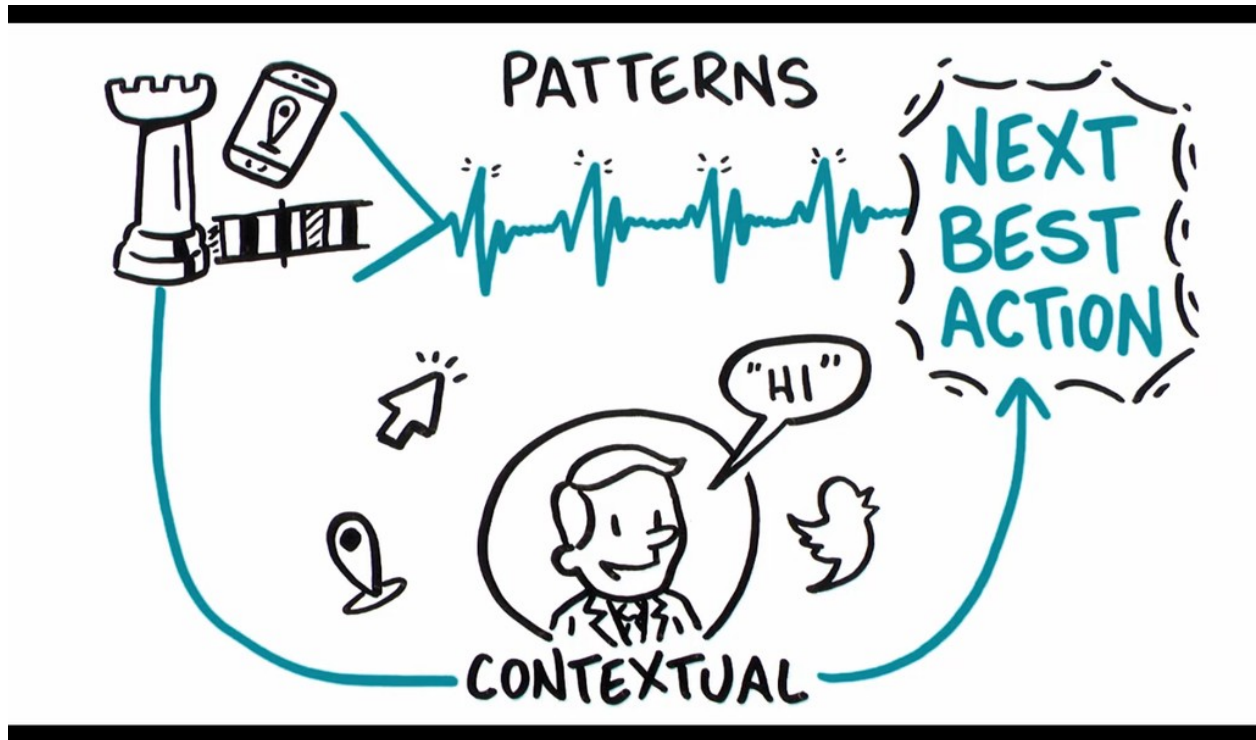
Pega's AI is built for business people, not scientists or developers. They design visual decision strategies that combine predictive analytics, algorithms developed through mining large sets of data, adaptive analytics, machine-learning algorithms that improve with each interaction, and traditional business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



1:1 Customer Engagement paradigm

The optimal outcome of every customer interaction is to provide a great experience while maximizing the value of the customer to the company. To achieve this outcome, you must perform the right action in the right channel at the right moment for each customer. In Pega Customer Decision Hub™, this feature is known as One-to-one Customer Engagement.

Transcript

The optimal outcome of every customer interaction is to provide a great experience while maximizing the value of the customer to the company.

In a traditional approach marketers search for potential customers from a database based on target demographics, geographies, or financial means to make a purchase. Then, marketers target this customer segment across all channels, and all these customers receive offers for a specific product.

The problem with this approach is that only a low percentage of customers respond or make a purchase. Marketers might hit their short-term goal, but in the long term, this approach affects the relationship with customers.

As a result, the traditional marketing approach fails because of a lack of relevance, context, timing, and empathy.

Why this fails

Lack of **RELEVANCE**

Lack of **CONTEXT**

Lack of **TIMING**

Lack of **EMPATHY**

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

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 must perform the right action in the right channel at the right moment for each customer.



Traditional mass-marketing techniques that use segments, batches, and campaigns do not move the needle anymore; they are antiquated and unsustainable. The market has recentered around real-time technologies and one-to-one customer interactions.



The Pega approach to these interactions is through One-to-one Customer Engagement.

Through One-to-one Customer Engagement, companies can 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 One-to-one Customer Engagement is one centralized brain.

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

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



In Pega Customer Decision Hub, this centralized brain is the core feature that uses AI to enable One-to-one Customer Engagement.

In Pega Infinity, 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.

The “brain” collects data from every customer engagement across the enterprise to create predictions and decisions about every interaction in every channel.

Pega Customer Decision Hub can directly integrate with third-party content management platforms such as Adobe Experience Manager and use the content that you develop in these platforms for personalized customer engagement.

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



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 actions.



Every next best action weighs customer needs against business needs to optimize decisions based on priorities set by the business manager.

In the milliseconds before interacting with a customer, Customer Decision Hub combines thousands of business rules and predictive and adaptive models that determine customer needs and interests to ensure the next best action is relevant by keeping it personal, timely, contextual, and empathetic.

Customer Decision Hub identifies the best moments to make a sale, provide a service, make a retention offer, inform about an offer, or do nothing at all (for example, if no offer is relevant enough to warrant the customer’s attention). The system distributes next-best-action decisions in real time to your channels, such as the web, mobile, and contact center. Pega Customer Decision Hub can also distribute next best actions to real-time paid channels such as Google, YouTube, Facebook, LinkedIn, and Instagram. Pega Customer Decision Hub also integrates with non-real-time outbound channels such as data management platforms (DMPs) and email.

After the system distributes the next best actions and the “brain” receives customer responses, the process begins again. Customer Decision Hub distributes new next best actions in milliseconds. It captures every customer interaction in every channel to ensure consistency and an optimized customer experience across channels.



For example, consider a customer, Miranda. With the centralized brain in place, instead of looking only at sales offers, the system begins with a list of all potential actions, such as service, retention, nurture, or a hardship message, everything that you can do for this customer now.

Although AI drives the next best actions, AI does not run rampant; it experiments on every person with every topic. Customer Decision Hub still allows marketers to maintain control and establish the criteria that AI must meet to consider beginning one of these conversations.

For example, you establish eligibility rules that state the business cannot sell a card to someone under the age of 18.

Then there are applicability rules to define if the action is appropriate at a given time. If Miranda already owns a competing or more valuable product, the business does not offer this product to her even though she is eligible.

Suitability rules determine whether an action is in the best interest of a customer. For example, Miranda might be eligible for a card, and her current card does not offer as high of a cash-back offer. But because Miranda cannot make her monthly payments and might end up in collections, the business does not offer the card to her even though it can.

So, if a customer fails to meet the conditions that you establish for an action, the AI does not consider that action.

Next-Best-Action Decisions



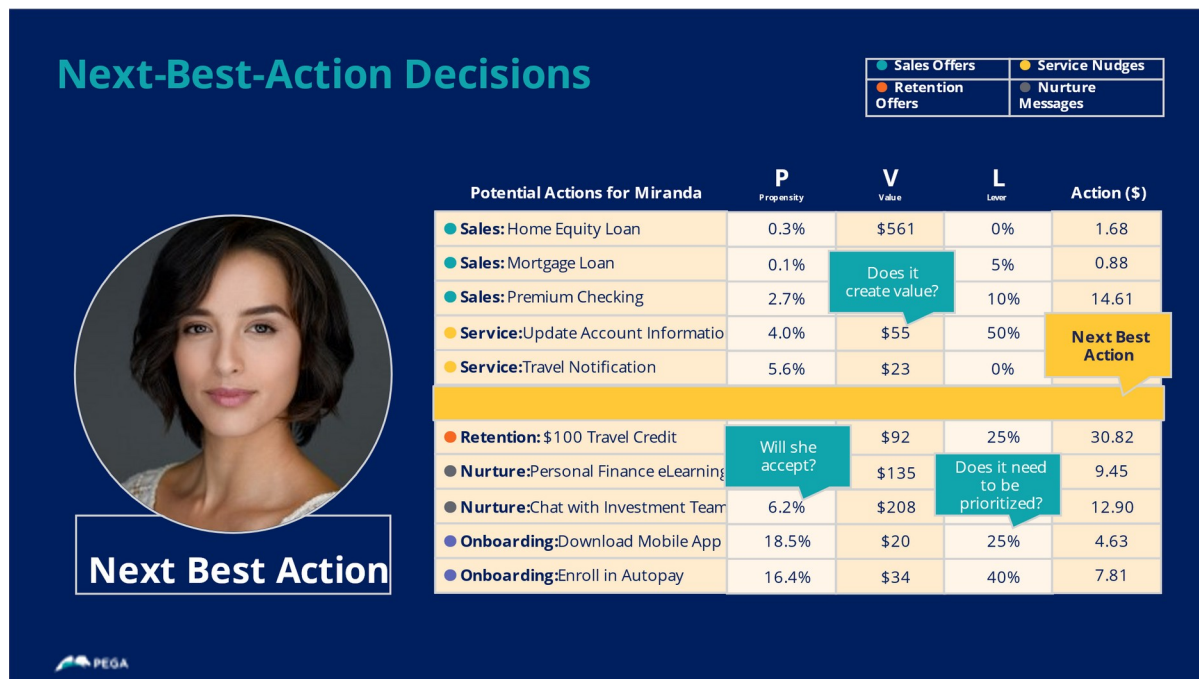
Should we arbitrate?

| Potential Actions for Miranda | Eligible? | Applicable? | Suitable? | Arbitrate? |
|----------------------------------------------------------------------------|-----------|-------------|-----------|------------|
| ● Sales: Rewards Card | ✓ | ✓ | ✗ | No |
| ● Sales: Home Equity Loan | ✓ | ✓ | ✓ | Yes |
| ● Sales: Mortgage Loan | ✓ | ✓ | ✓ | Yes |
| ● Sales: Premium Checking | ✓ | ✓ | ✓ | Yes |
| ● Service: Update Account Information | ✓ | ✓ | ✓ | Yes |
| ● Service: Fraud Alert | ✓ | ✗ | — | No |
| ● Service: Travel Notification | ✓ | ✓ | ✓ | Yes |
| ● Retention: Waive Annual Fee | ✓ | ✓ | ✓ | Yes |
| ● Retention: Double Rewards Points | ✗ | — | — | No |
| ● Retention: \$100 Travel Credit | ✓ | ✓ | ✓ | Yes |
| ● Nurture: Personal Finance eLearning | ✓ | ✓ | ✓ | Yes |
| ● Nurture: Chat with Investment Team | ✓ | ✓ | ✓ | Yes |
| ● Onboarding: Download Mobile App | ✓ | ✓ | ✓ | Yes |
| ● Onboarding: Enroll in Autopay | ✓ | ✓ | ✓ | Yes |

Once the system narrows down the list, AI takes over. AI first determines how likely each action is desirable to the customer. Next, it determines the value each option generates for the business. What is the impact if the customer reads the content or accepts an offer? Does it give you more revenue or reduce your costs?

You can add levers to make adjustments based on the current business situation. For example, the business can decide to nudge an offer if it needs to meet its financial goals or ramp down an offer if it runs low on inventory.

For Miranda, the action that the system selects as the next best action is the one with the highest P*V*L value.



In summary, Customer Decision Hub is the always-on brain that acts as a single, centralized decision authority.

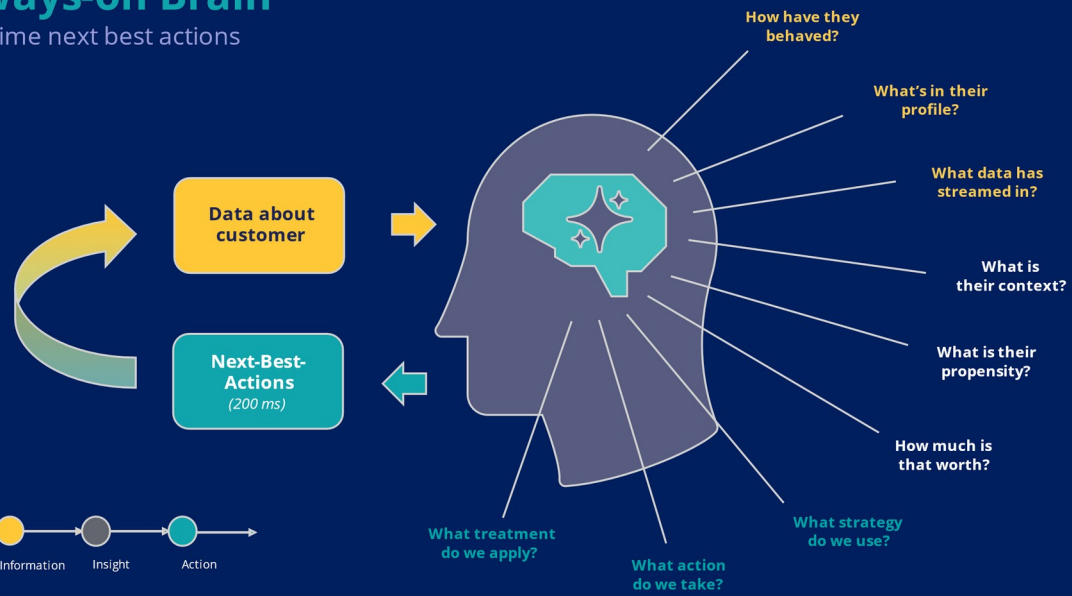
It uses data about the customer, including past interactions, as input.

It uses advanced AI techniques to make predictions.

Decision strategies (which combine traditional business rules with predictive, adaptive, and text analytics) deliver consistent and personalized next best actions across all channels.

Always-on Brain

Real-time next best actions



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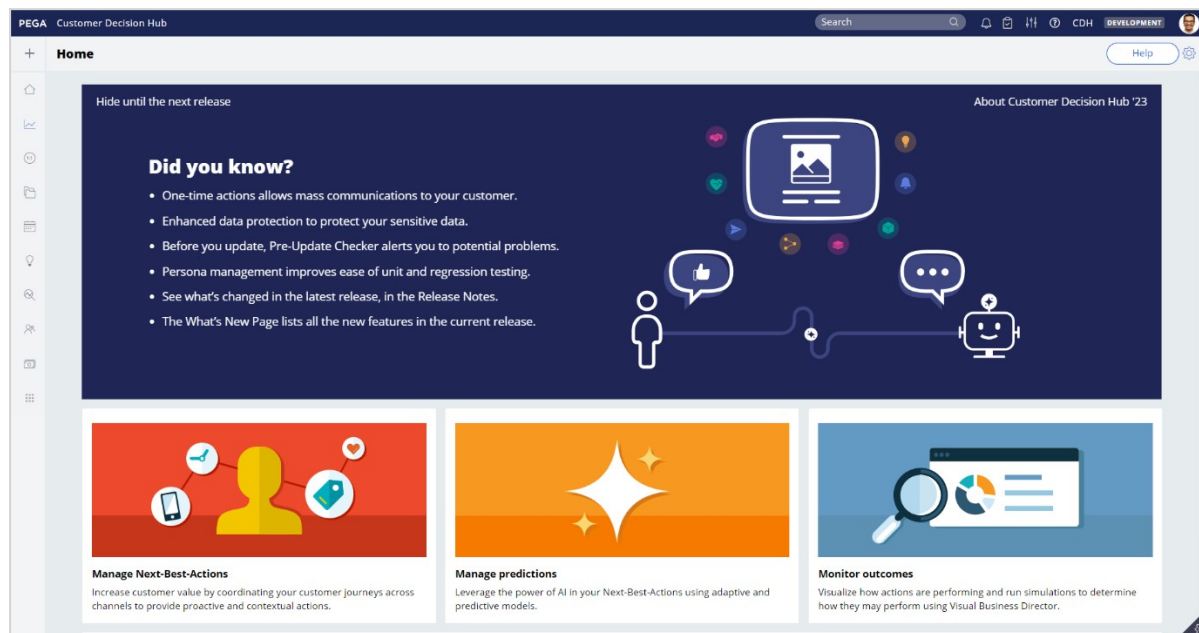
Pega Customer Decision Hub overview

Pega Customer Decision Hub™ optimizes customer lifetime value by providing an "always-on brain" for your business. With Customer Decision Hub, you can unify your data, analytics, and channels into a single, connected experience so that you can predict customer needs in real-time. You then deliver hyper-personalized next best actions that drive long-term loyalty across channels and at scale.

Transcript

Most marketing stacks use a combination of channel-based decisioning solutions, that do not work out-of-the-box together and cannot keep pace with today's customers. The design of these marketing stacks intends to push products rather than solve problems. Building real relationships with today's customers means engaging them one-to-one, anticipating their needs, and delivering relevant experiences across channels.

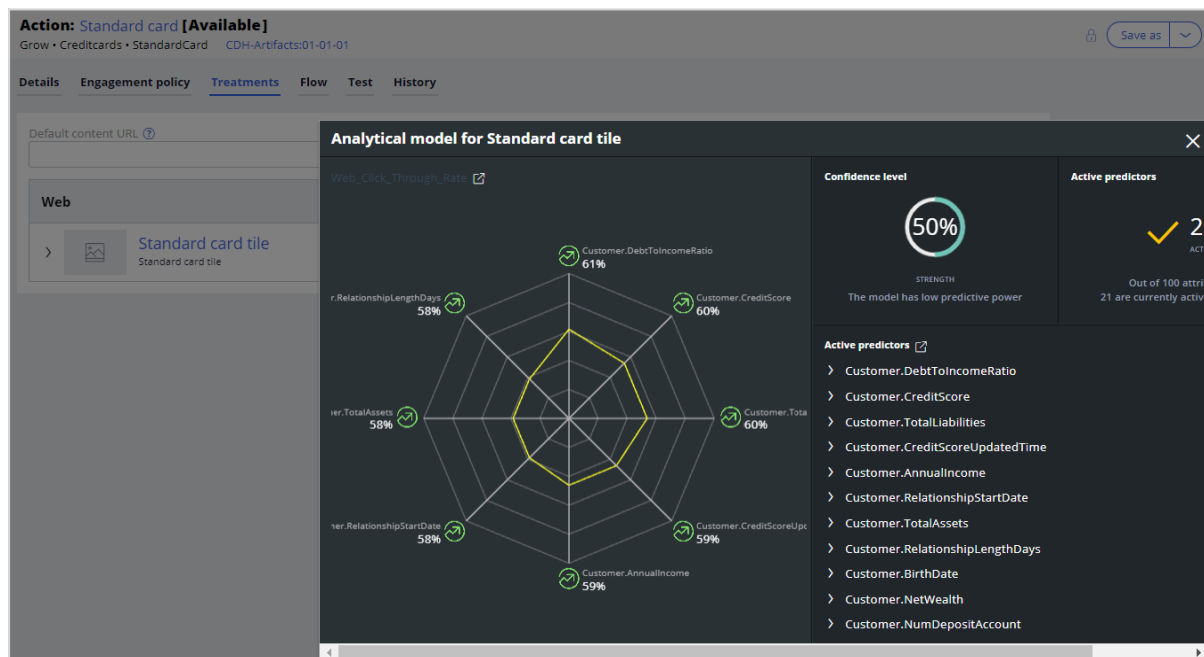
Pega Customer Decision Hub is the central decision engine of your marketing stack, constantly analyzing the context of the customer and recommending the most relevant, next best action to take, all in real time. Here is how it works.



You first identify the outcomes that you want to achieve, such as increasing sales, reducing churn, or preventing service issues. These outcomes are called business issues. A business issue is the purpose behind the actions that you offer to customers. The business issues contain business groups to organize actions into categories.

| Issues / Groups | Description | Action naming |
|--------------------|-----------------------------------------------------------------------------------------|---------------|
| Acquire | Drive conversion rate and generate sustainable growth | |
| ☰ Credit cards | Actions to improve customer's card acquisition journey experience | |
| ☰ Auto loans | Actions to improve customer's auto account acquisition journey experience | |
| ☰ Deposit accounts | Actions to improve customer's deposit account acquisition journey experience | |
| ☰ Mortgages | Actions to improve customer's Home loan acquisition journey experience | |
| Grow | Develop deeper and more profitable relationship with existing clients | |
| ☰ Credit cards | Credit card products for existing customers | |
| ☰ Deposit accounts | Deposit account products for existing customers | |
| ☰ Mortgages | Actions which help to build deeper relationships based on customers need for home loans | |
| Nurture | Nurture customer relationship to drive more engagement | |
| ☰ Webinars | Includes webinars for developing customer relationships | |
| ☰ Credit cards | Maximize the benefits card customers receive | |
| ☰ Articles | Fuel you content marketing using knowledge articles | |
| ☰ Mobile banking | Highlight the convenience & security of mobile banking | |
| Retain | Improve customer attrition | |

Next, you create actions, such as upsell or cross-sell offers, retention bundles, and nurture messages that Customer Decision Hub uses to engage your customers. You create treatments, variations of these actions, to tailor that engagement to multiple channels. Each action and treatment automatically receive a predictive model, so our AI can determine exactly what each customer needs.



With Customer Decision Hub, the next-best-action customer journey takes a transformational approach by using real-time AI to prioritize across all potential journeys and actions to deliver more relevant customer experiences.

Customer Decision Hub helps marketers leverage thousands of pieces of historical data and identify the actions and journeys that lead to positive engagement. Because Customer Decision Hub takes advantage of real-time machine learning, all the predictions are up to date, which ensures that customers receive personalized offers at each stage.

You define a journey once across all business objectives, channels, and lines of business. Then, you add the different stages and assign the corresponding actions to each one. As customers move through their journeys, the AI learns continuously and automatically to identify which actions work best at each stage and pivots between selling, serving, and retaining in real time as the needs of customers change.

Then, you define specific channel and action limits and limit overexposure to a specific action or group of actions. With outbound and inbound action limits, you restrict the number of actions that the system presents to customers in a given period of time.

The screenshot displays the 'Constraints' configuration page. At the top right, it shows 'CDH-Artifacts: 01-01-01' and 'Edited 6 days ago by Decisioning Architect', along with 'Edit' and 'Actions' buttons. The main content is organized into sections:

- Outbound channel limits**: A list of channel categories with their respective limits:
 - All outbound: 2 limits defined
 - Outbound Retail: 1 limit defined
 - Email: 1 limit defined
 - Direct Mail: 1 limit defined
 - SMS: 1 limit defined
 - Push: 1 limit defined
 - Outbound Call Center: 1 limit defined
- Outbound action limits**:
 - All issues / All groups (All categories): 1 limit defined
- Inbound action limits**:
 - Call center: 1 limit defined
 - Retail: 1 limit defined
 - Web: 1 limit defined
- Contact policy library**:
 - CP-IMPR-G-7D: Track Impressions for the action over the past 7 days
 - CP-ACPT-G-7D: Track Accepts for the action over the past 7 days

Next, you set rules of engagement so that Customer Decision Hub knows what customers are eligible for, when certain actions make sense, and what to prioritize in different situations. Engagement policies are a set of business rules and practices that the organization uses to determine which customers qualify for which next best actions. These policies allow you to specify the conditions under which an action or group of actions a customer is eligible for.

The screenshot displays the 'Business structure' sidebar on the left, with 'Credit cards' selected under the 'Grow' category. The main content area shows the configuration for the 'Credit cards' group. It includes sections for 'All actions', 'Customer actions', and 'Eligibility', 'Applicability', and 'Suitability' criteria. A table titled '4 Actions (4 with specialized policies)' lists the following actions and their specialized policies:

| Name | Specialized policies |
|----------------------|----------------------|
| Standard card | E |
| Rewards card | E |
| Rewards Plus card | S |
| Premier Rewards card | S |

You balance customer relevance with business priorities by using arbitration. Arbitration is how Customer Decision Hub prioritizes the remaining list of eligible, applicable, and suitable actions from each group. On the **Arbitration** tab of Next-Best-Action Designer, you can define the AI controls that the system uses to rank the next best action for each customer.

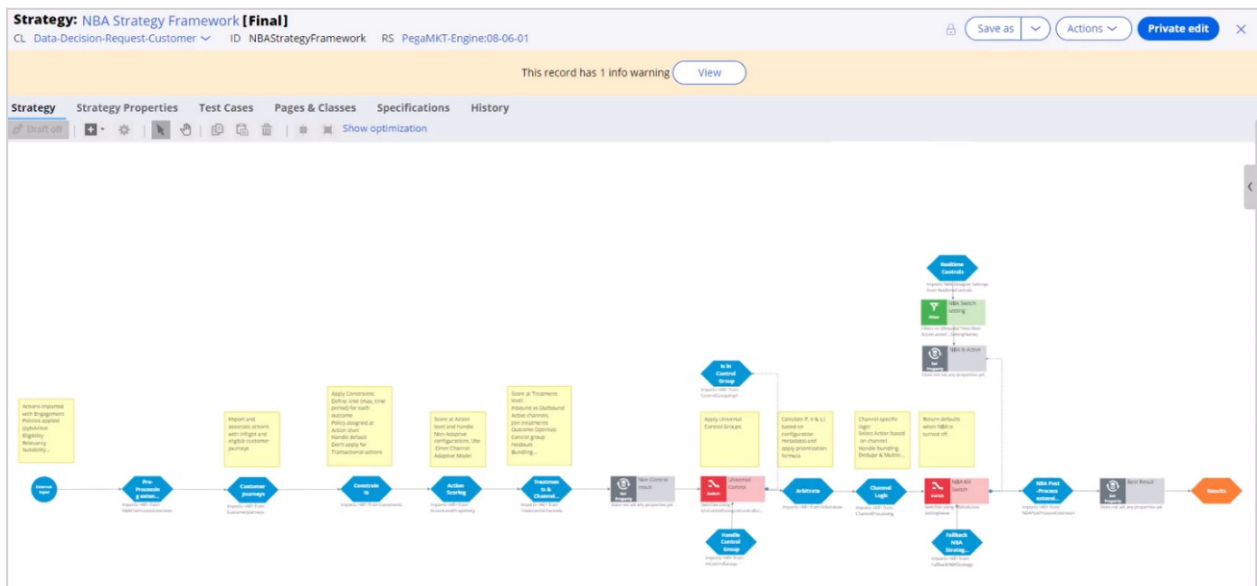
The 'Arbitration' configuration page features a visual equation: **Customer relevance** (Propensity × Context weighting) × **Business priority** (Business value × Business levers) = **Final priority** (Explore arbitration results). Below this, there are five sections for configuring thresholds:

- Propensity**: Ensure only relevant messages get communicated to customers and determine the source for propensities. 0 thresholds defined.
- Context weighting**: Upweight actions based on real-time contextual data passed by channel applications. 10 contexts defined.
- Business value**: Extend the way business value is calculated through the CalculateBusinessValue extension point. 0 thresholds defined.
- Business levers**: Upweight actions based on the business structure, and toggle all individual action levers ON/OFF. 0 levers defined.
- Priority**: Ensure that only the most important messages get delivered to customers. 0 thresholds defined.

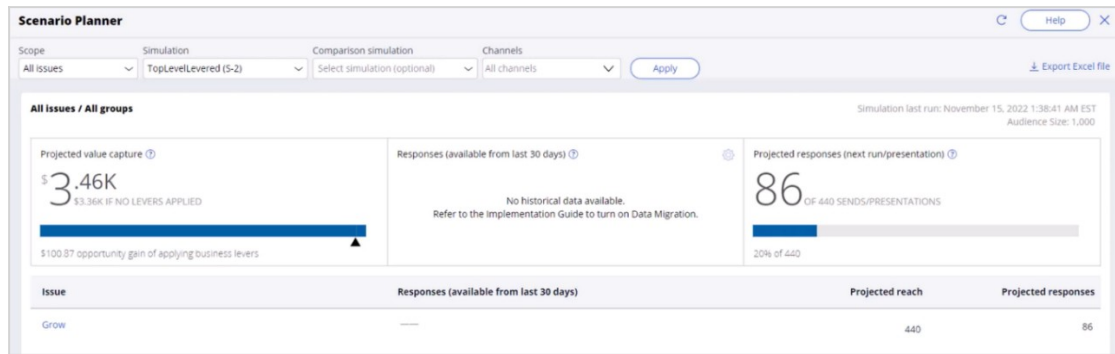
Finally, you activate your next best actions in the intended delivery channels, which creates a "brain" that powers your entire engagement program.

As you use the Next-Best-Action Designer user interface to define strategy criteria, the system uses these criteria to create the 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 Customer Decision Hub, which determines the personalized set of next best actions for each customer. There are several extension points in the framework. An extension point is an empty rule or activity that is intended to be overridden to meet the specific needs of the application.

In most cases, you do not need to configure the strategy directly. However, Customer Decision Hub includes extension points if you need to add your own business logic to the framework.



With Customer Decision Hub, you also have all the tools you need to test the AI, simulate different strategies, and find the right mix to optimize performance across your key performance indicators (KPIs). With Scenario Planner, you can compare different configurations, to see which one best impacts your business. With Value Finder, you can also identify underserved customers through simulation tests that allow you to investigate how an introduction of a new engagement policy might affect actions that are offered across a segment of customers.



Customer categories

Analysis of the current customer engagement. Click on a customer category to find out more details.

Category:

| | | |
|---|------------------------------|-------------------------------------------|
| > | 329 customers (32.9%) | No actions after suitability |
| > | 212 customers (21.2%) | Only irrelevant actions after eligibility |
| > | 207 customers (20.7%) | No actions after eligibility |
| > | 75 customers (7.5%) | No actions after applicability |
| > | 32 customers (3.2%) | Only irrelevant actions after suitability |
| > | 3 customers (0.3%) | Only irrelevant actions after arbitration |

Pega Customer Decision Hub is designed to address the needs of your customers. To fulfill this objective, the application is specifically configured to align with business requirements. You can access a summary of your application's configuration through the **Application Overview**. This landing page provides crucial details about enabled modules, environments, Rulesets, and metrics, and offers insights into the health of your next best action, suggesting areas for further review.

The information from the **Application Overview** helps you understand how the application is currently configured and how it performs against the current configuration. For example, it showcases the number of active issues, groups, and actions within the

system, as well as provides information on treatments and the performance of actions. Additionally, it highlights areas that can benefit from improvement.

Each time a customer engages with an offer, the channel calls Customer Decision Hub for a new next best action. Because Customer Decision Hub updates itself every time you receive a new piece of data, you constantly trigger new offers and messages as you learn more about each customer.

So, whether customers browse the web, read an email or mobile message, talk with a CSR, or see a digital ad, that experience is all about them every time. Pega Customer Decision Hub helps you embrace empathy at scale across your entire enterprise, helps customers get what they need, and helps you generate hundreds of millions in incremental value every year.

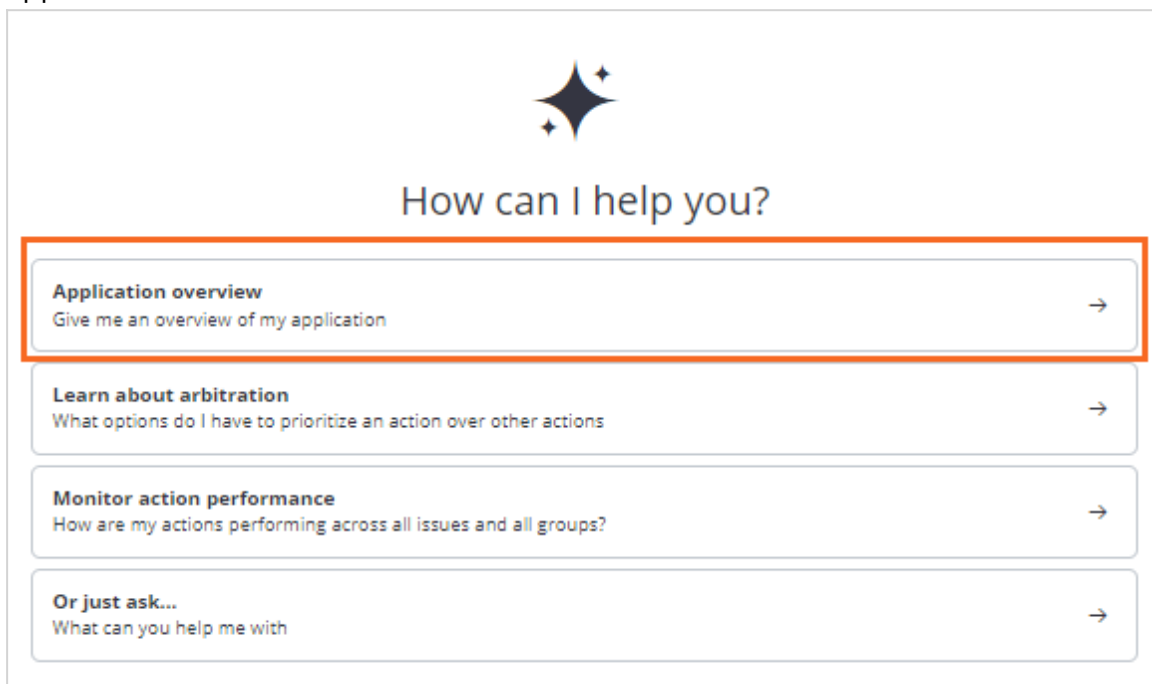
CDH Assistant overview

CDH Assistant is an AI-powered conversational feature that is seamlessly integrated with the Pega Customer Decision Hub™ and Pega 1:1 Operations Manager infrastructure. Its main purpose is to enhance your decision-making process, boost productivity, and unleash the full potential of your business by simplifying the search process and delivering personalized results.

This is Pega Customer Decision Hub. The Pega Infinity™ '24.1 software suite introduces a new feature to simplify knowledge searching in Pega Customer Decision Hub – CDH Assistant.

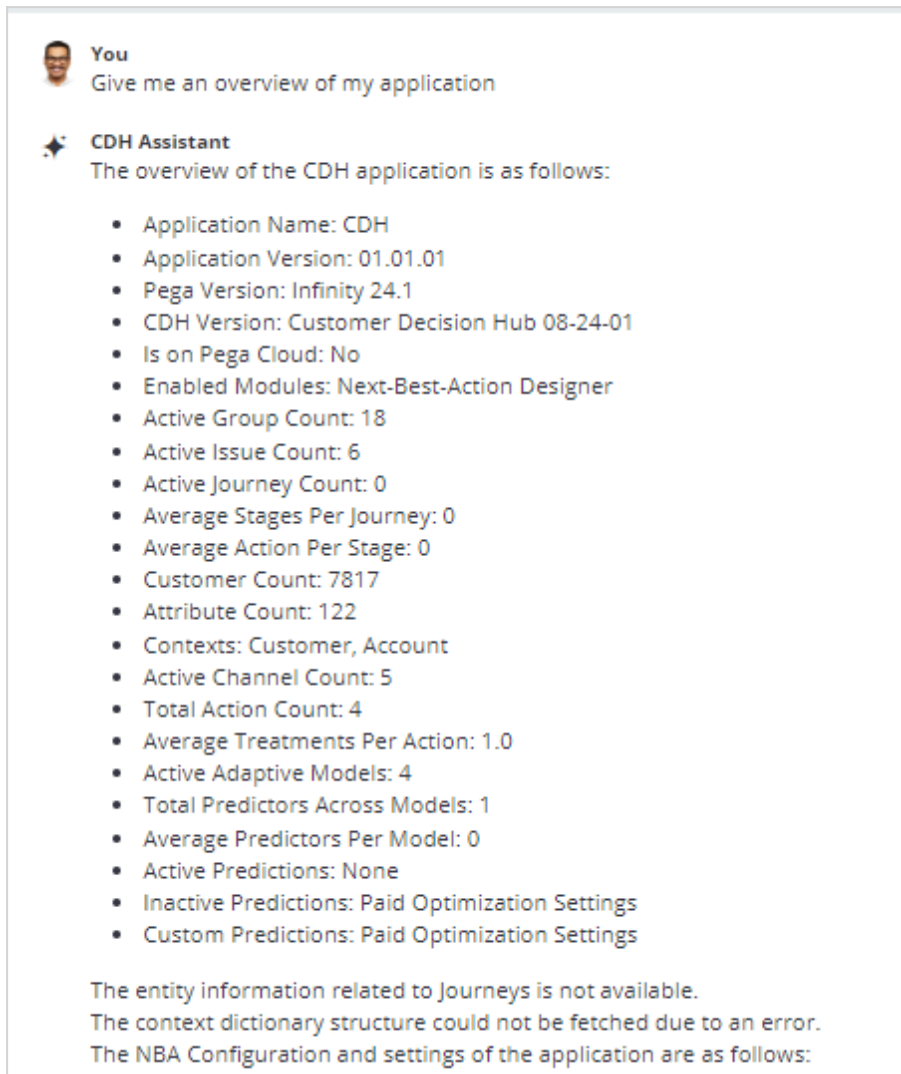
To access CDH Assistant, click the CDH Assistant tab, and you will be directed to the Assistant’s landing page. From there, you have two options to start your conversation. You can either choose a topic provided on the landing page, or enter your own questions to obtain the information that you need for your particular use case.

Click the **Application overview** tile to learn more about the Customer Decision Hub application.



By utilizing CDH Assistant, you gain a comprehensive overview of your application within Customer Decision Hub. This includes detailed insights into Containers, Channels, Context, Rulesets, and Actions. Additionally, you can access information about configurations and performance metrics, such as accepts, sends, clicks, and impressions for your actions,

issues, and groups.



The screenshot shows a chat interface. At the top, a user icon is followed by the text "You Give me an overview of my application". Below this, a star icon is followed by "CDH Assistant" and the text "The overview of the CDH application is as follows:". A bulleted list of application metrics follows, including application name, version, Pega version, CDH version, cloud status, enabled modules, and various counts for groups, issues, journeys, stages, actions, customers, attributes, contexts, channels, treatments, adaptive models, predictors, and predictions. At the bottom, three lines of error messages are displayed in a smaller font.

You
Give me an overview of my application

CDH Assistant
The overview of the CDH application is as follows:

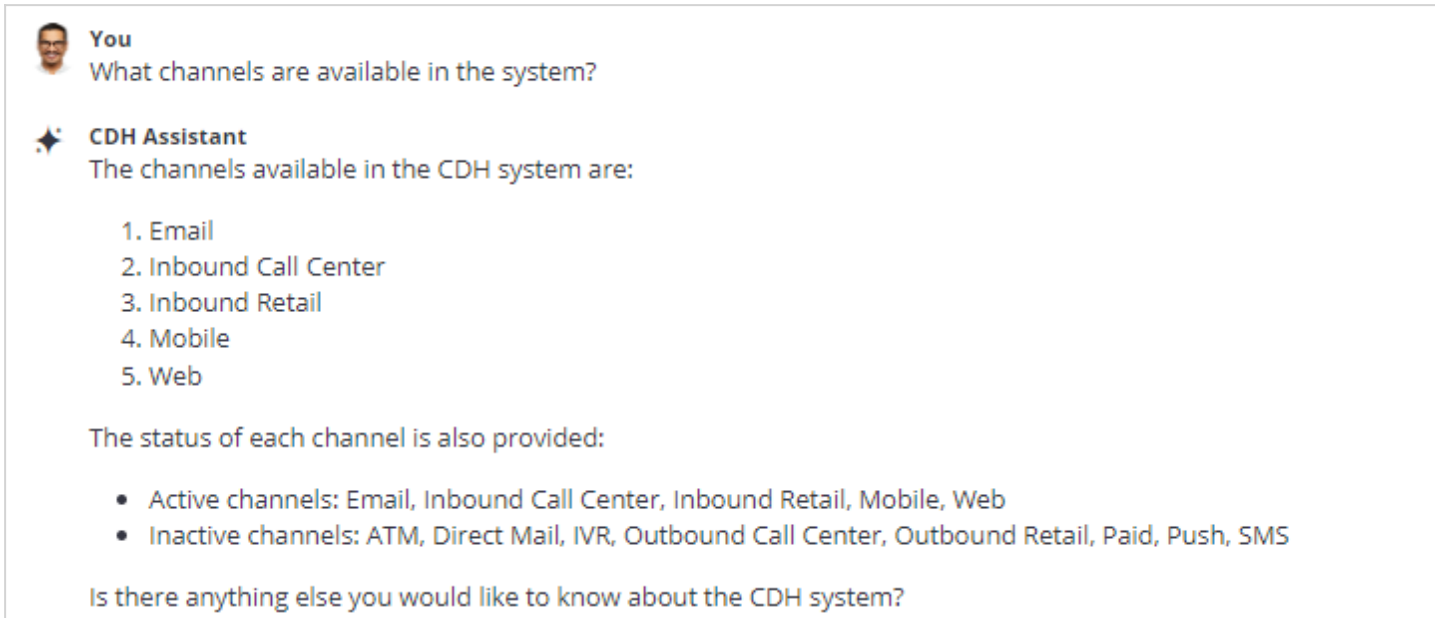
- Application Name: CDH
- Application Version: 01.01.01
- Pega Version: Infinity 24.1
- CDH Version: Customer Decision Hub 08-24-01
- Is on Pega Cloud: No
- Enabled Modules: Next-Best-Action Designer
- Active Group Count: 18
- Active Issue Count: 6
- Active Journey Count: 0
- Average Stages Per Journey: 0
- Average Action Per Stage: 0
- Customer Count: 7817
- Attribute Count: 122
- Contexts: Customer, Account
- Active Channel Count: 5
- Total Action Count: 4
- Average Treatments Per Action: 1.0
- Active Adaptive Models: 4
- Total Predictors Across Models: 1
- Average Predictors Per Model: 0
- Active Predictions: None
- Inactive Predictions: Paid Optimization Settings
- Custom Predictions: Paid Optimization Settings

The entity information related to Journeys is not available.
The context dictionary structure could not be fetched due to an error.
The NBA Configuration and settings of the application are as follows:

Furthermore, CDH Assistant not only provides application-related information but also enables you to inquire about other Pega products. You can seek guidance on installation, implementation, configuration, and troubleshooting.

The Assistant will search the extensive Pega documentation set and provide you with the most relevant response, tailored to your needs, together with a link to the source of the knowledge.

You can continue this conversation by asking additional questions, for example:



You
What channels are available in the system?

CDH Assistant
The channels available in the CDH system are:

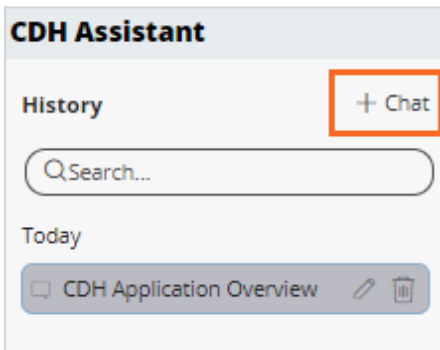
1. Email
2. Inbound Call Center
3. Inbound Retail
4. Mobile
5. Web

The status of each channel is also provided:

- Active channels: Email, Inbound Call Center, Inbound Retail, Mobile, Web
- Inactive channels: ATM, Direct Mail, IVR, Outbound Call Center, Outbound Retail, Paid, Push, SMS

Is there anything else you would like to know about the CDH system?

To keep your conversations in order, always start a new chat for a specific concept, feature, or product. This is a good practice because the context of the overall conversation can affect the Assistant's answers.



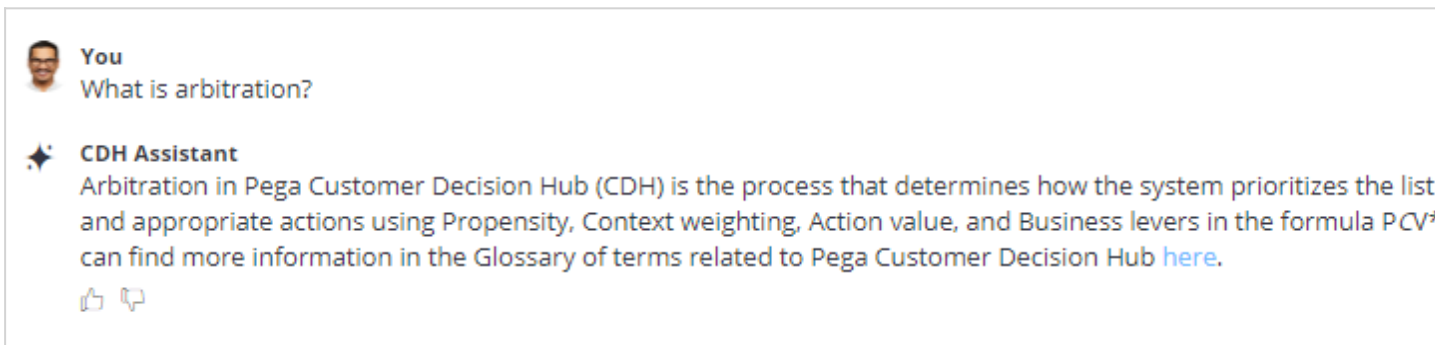
CDH Assistant

History + Chat

Q Search...

Today

CDH Application Overview ✎ 🗑



You
What is arbitration?

CDH Assistant
Arbitration in Pega Customer Decision Hub (CDH) is the process that determines how the system prioritizes the list of offers and appropriate actions using Propensity, Context weighting, Action value, and Business levers in the formula PCV^* . You can find more information in the Glossary of terms related to Pega Customer Decision Hub [here](#).

👍 👎

You can also rename your conversations so that the names reflect their main objective, and this can help you search past conversations to more easily find answers.

Lastly, all your past conversations are conveniently stored in the History section, ensuring that you can refer back to them whenever necessary.

CDH Assistant not only answers questions about the product but also allows you to interact with the documentation by providing links to the relevant sources of knowledge.

You have reached the end of this video. You have learned:

- What is CDH Assistant.
- How to use CDH Assistant.

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

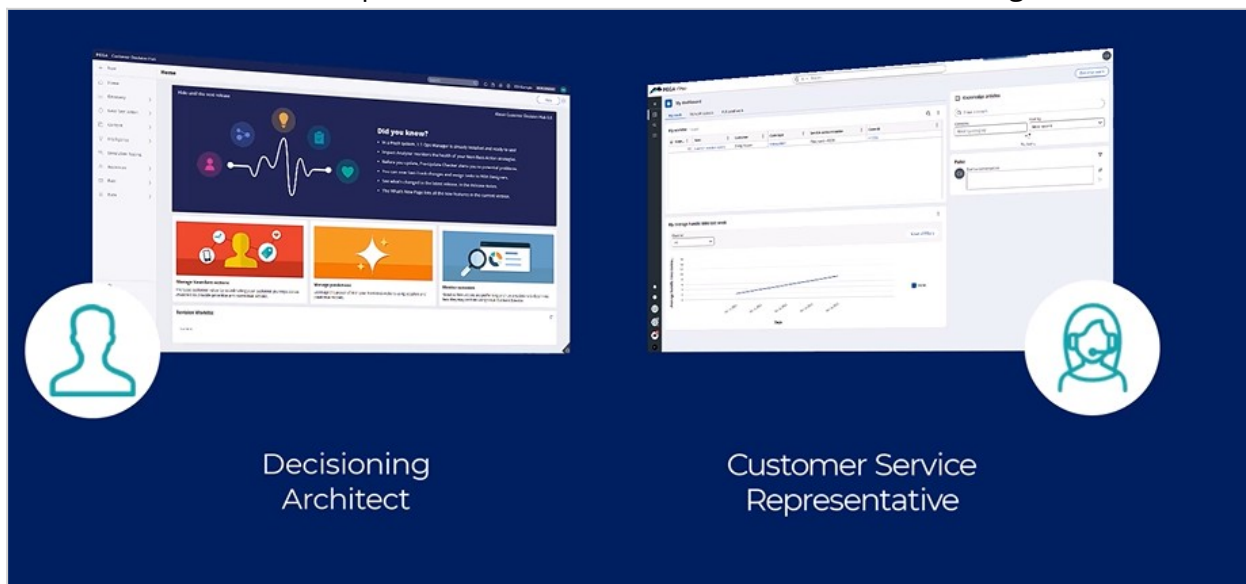
Next best action in a contact center

Pega Customer Decision Hub™ is an "always on" centralized decisioning "brain" that calculates a one-to-one business case for every Next-Best-Action recommendation. To create the business case, Customer Decision Hub combines the customer profile with previous interaction results, the current call context, and business rules, and then applies predictive analytics. Next-best-action recommendations occur across multiple channels, including the contact center.

Transcript

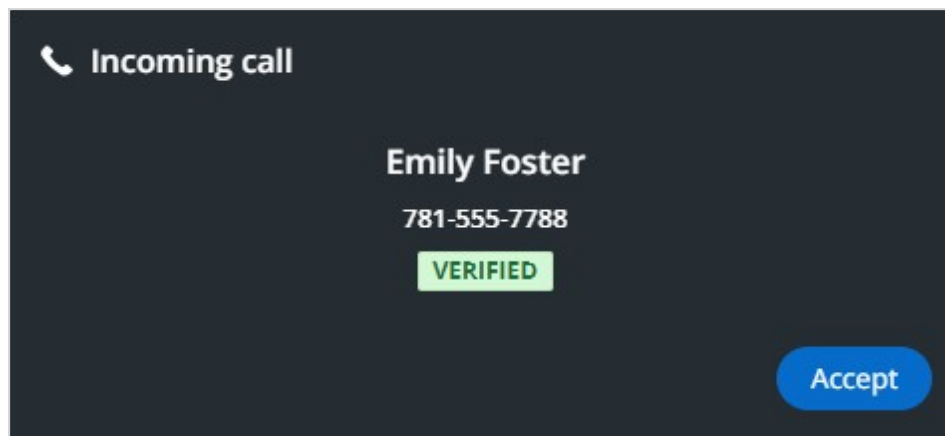
Next-best-action recommendations help to ensure that a Customer Service Representative (CSR) takes relevant actions at every step during a customer interaction.

In this scenario, U+ Bank is a retail bank that uses **Pega Customer Decision Hub (CDH)** and **Pega Customer Service** in its contact center. All the configurations implemented by the decisioning architect in Pega Customer Decision Hub are visible to the CSR in Pega Customer Service, and help them achieve the best results when interacting with customers.



Let's consider an example of a customer interaction:

A call comes into the U+ Bank service center from Emily Foster, a U+ customer. The system immediately routes the call to a CSR.



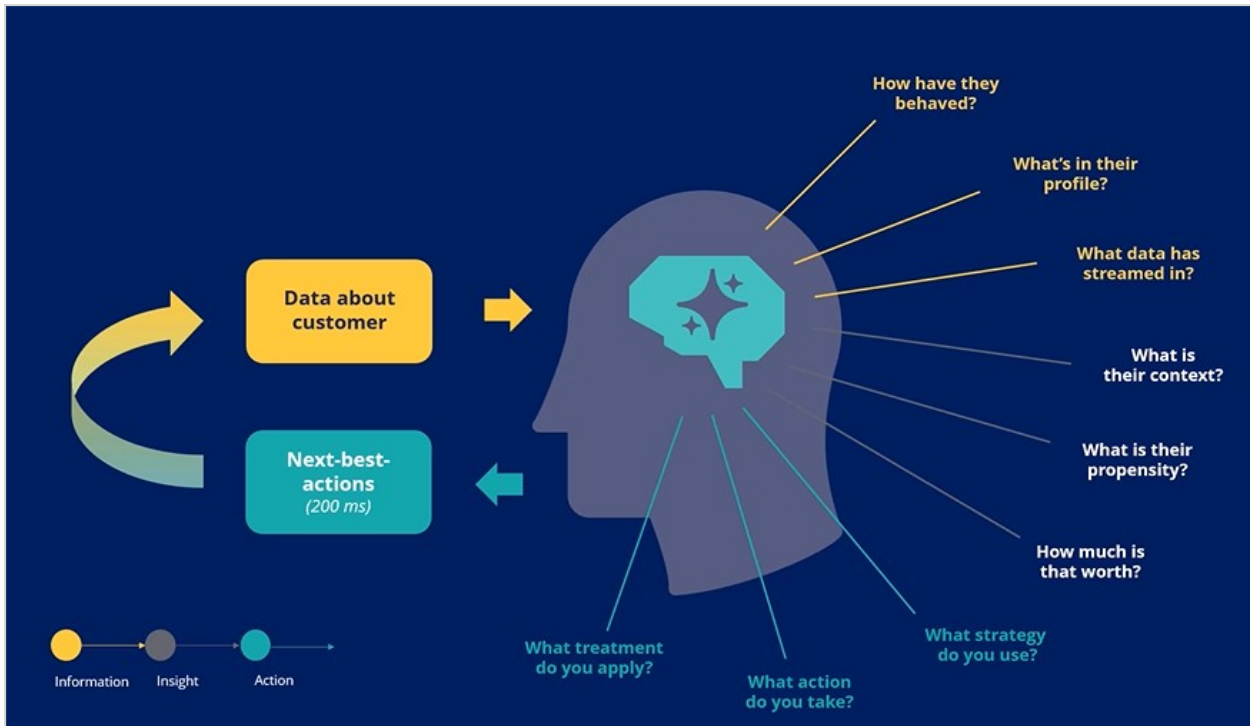
The call details from the interactive voice response (IVR) system indicate that Emily wants to discuss recent credit card transactions.

Once the CSR accepts the call, all relevant details about Emily are displayed on the main application window. The next-best-action recommendations then guide the CSR to take the next step with Emily.

In the lower-left corner of the screen, you can see the next best action that Customer Decision Hub recommends to the CSR.

Customer Decision Hub is an "always on" centralized decision management "brain" that calculates a one-to-one business case for every next-best-action recommendation. Customer Decision Hub combines the customer profile with previous interaction results, the current call context, and business rules to create the business case, and then applies predictive analytics.

Customer Decision Hub reevaluates 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 Emily's transaction dispute. So, the CSR carries out the task. However, the CSR is always in control and can select other service actions as appropriate during the conversation.

Dispute transactions

Capture dispute details S-2003 PENDING-INTAKE

Card * Dispute reason *

*****7340 - Emily Foster (Active) ▼

Duplicate charge ▼

Cancel

Once the CSR completes the task, the system refreshes the next best action to show the next recommended action, which is to present a credit card offer.

Customer Decision Hub analyzed Emily's credit score, which indicates that she is a customer with a high credit score.

So, the highest recommendation is for a Standard credit card, a top offer, which is relevant for customers with high credit scores.

The CSR can view more details about the recommended offer to discuss its benefits with Emily further.

Get 1% cash back on every purchase

Why this is relevant

Customer with high credit score

∨ **Benefits**

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

∨ **Pricing**

10% interest for 18 months when you transfer other card balances.

After learning about the benefits of the offer, Emily is not convinced that it is a good offer for her. Therefore, the CSR presents the other available offers recommended by Customer Decision Hub.

The CSR then presents the second top offer that is in the suggestions section. Now, Emily is interested in the offer, and she decides to accept it.

Other suggestions

Rewards card

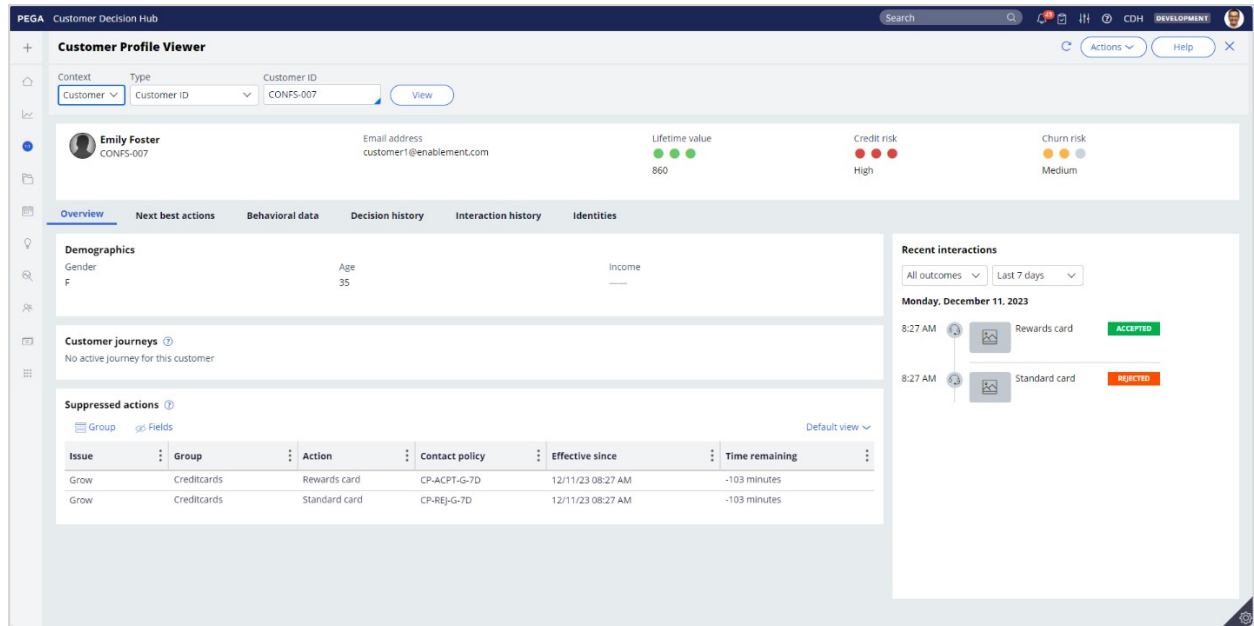
Get 1% cash back on every purchase

[More](#)

When the CSR accepts the offer, the offer fulfillment is complete, and the customer response is recorded in the Interaction History.

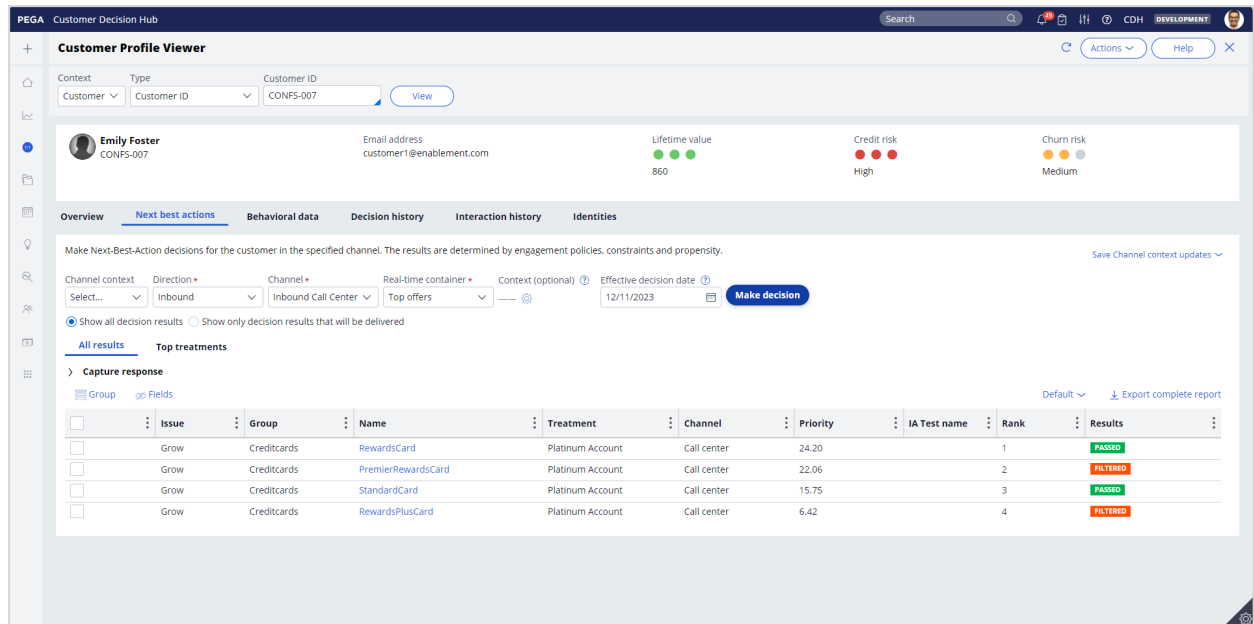
As a decisioning architect, you can use Pega Customer Decision Hub to input or configure data necessary to make the next best recommendations.

The recent interaction between the CSR and the customer, Emily Foster, was captured and is now visible on the overview tab of Customer Profile Viewer.



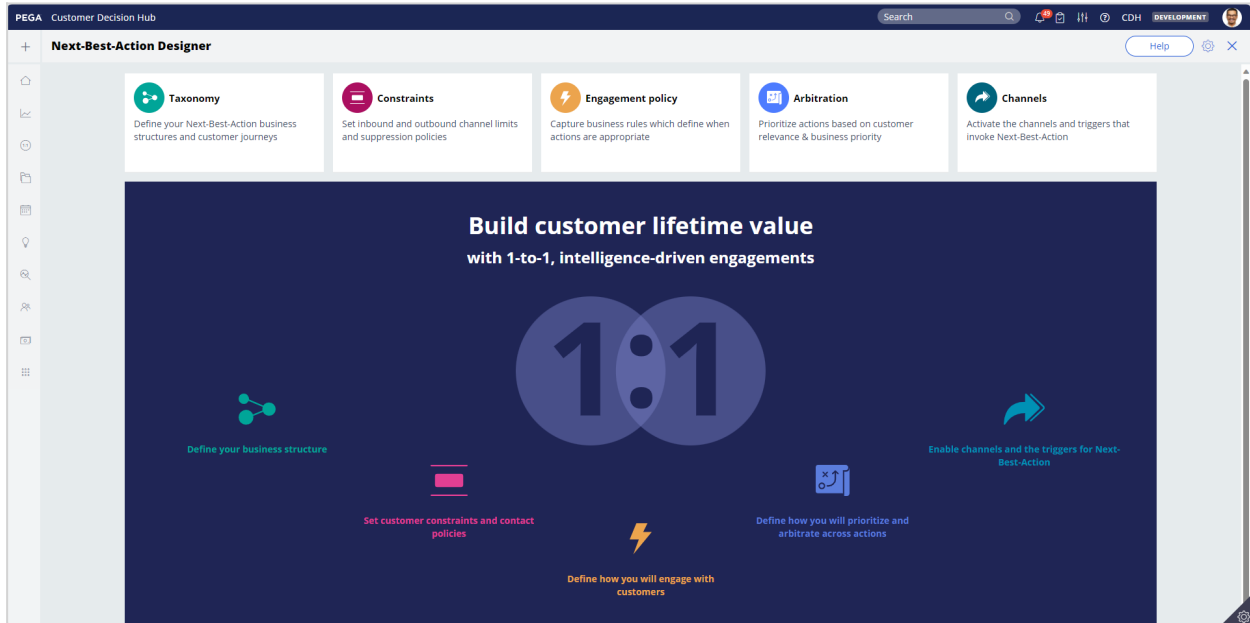
Customer Profile viewer allows you to explore customer profile details such as demographics, active customer journeys, suppressed actions, recent interactions behavioral data, decision history, and interaction history.

The Next best actions tab in Customer Profile Viewer shows what actions can be presented to the customer. You can provide some input parameters like direction, channel type, which real-time container to test, and what the next-best-action results would be.



Apart from the tailored offers, you can also examine the arbitration factors: prioritization, weighing, and propensity for the final result.

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



On the engagement policy tab of NBA designer, you can observe previously defined sets of actions belonging to specific issues and groups (in this case cross sell, credit cards).

You, as the decisioning architect, can also define group-level engagement policies and action-level engagement policies. All the applied eligibility, applicability, and suitability conditions are visible on the Customer offers tab.

Customer actions Policies: **E** **A** **C** Actions: 4

E Eligibility [?](#)
(Customer: Age is greater than or equal to 18)

A Applicability [?](#)
(Customer: Count of credit card accounts is equal to 0)

S Suitability [?](#)
No group criteria defined

C Contact policy [?](#)

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

Actions ⋮

4 Actions (4 with specialized policies)

| Name | Specialized policies |
|----------------------|----------------------|
| Standard card | E |
| Rewards card | E |
| Rewards Plus card | S |
| Premier Rewards card | S |

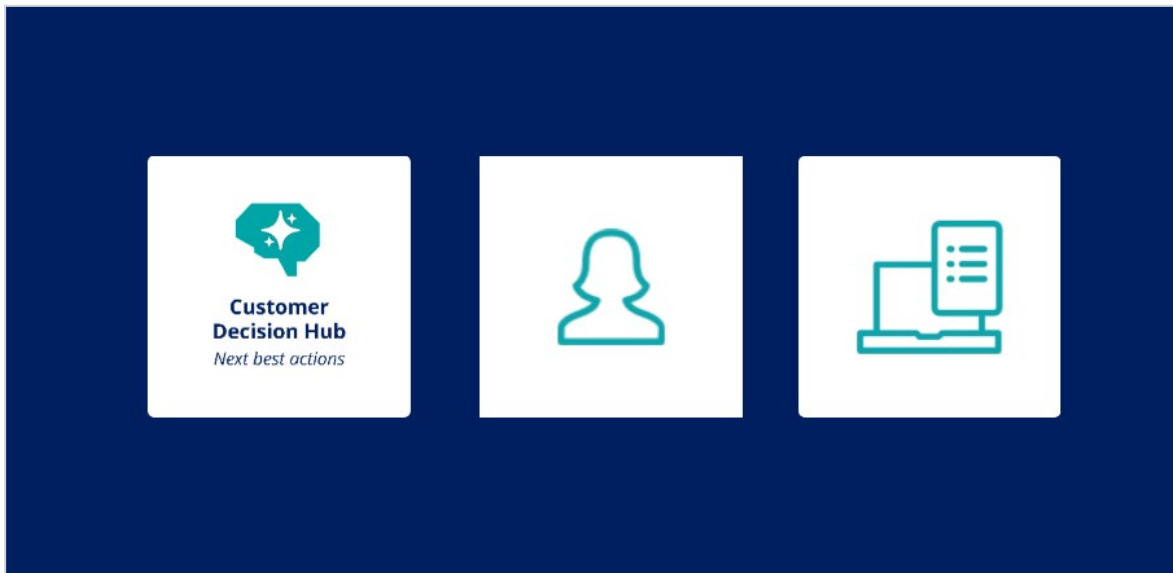
For an action, you can also define channel-specific treatments, which means that the action can be delivered to a customer by using a particular channel. The treatment contains all the data necessary for the CSR to offer the action to a customer.

To summarize, the Customer Sales Representative offered a customer a Next-Best-Action that was selected by the “always on” centralized decision management “brain” from a set of actions defined and configured by the Decisioning Architect.

Next best action on digital

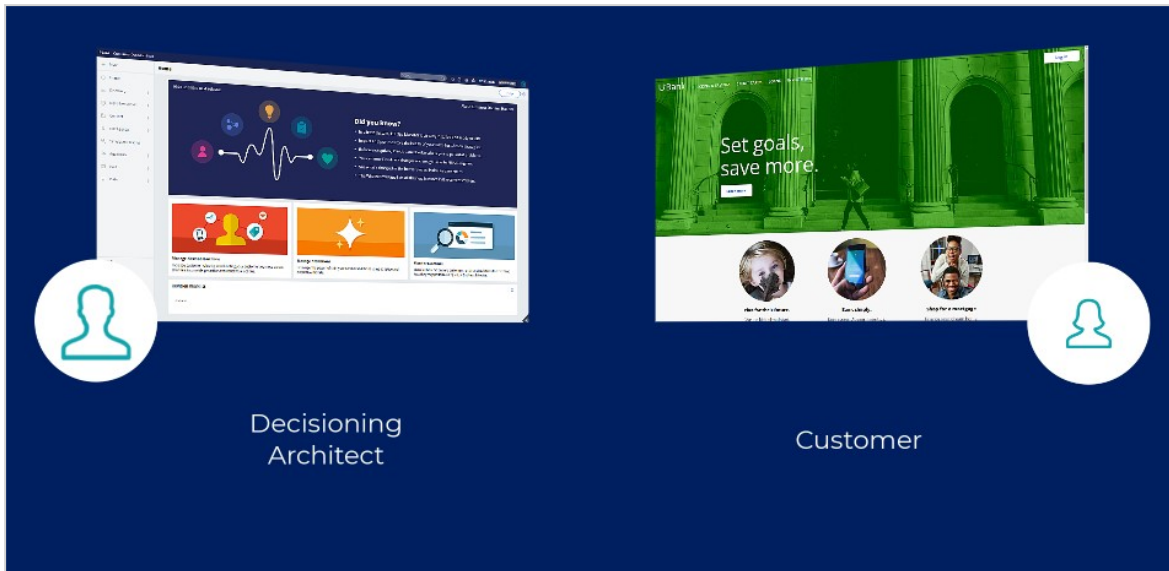
Transcript

Pega Customer Decision Hub can deliver the next-best-action recommendations through various inbound and outbound channels. Outbound messages involve proactively reaching out to customers, while inbound channels demand action from a customer. One such inbound channel is the web. For example, when a customer visits the website, they see the intended offers.



Consider the following web channel scenario, which is a typical cross-selling use case.

The next-best-action recommendations help to ensure that the customers of U+ Bank can see the tailor-made offer when visiting the website of the bank. The centralized decision management "brain" of Customer Decision Hub selects the next best action that is displayed for a customer based on configurations implemented by the Decisioning Architect.

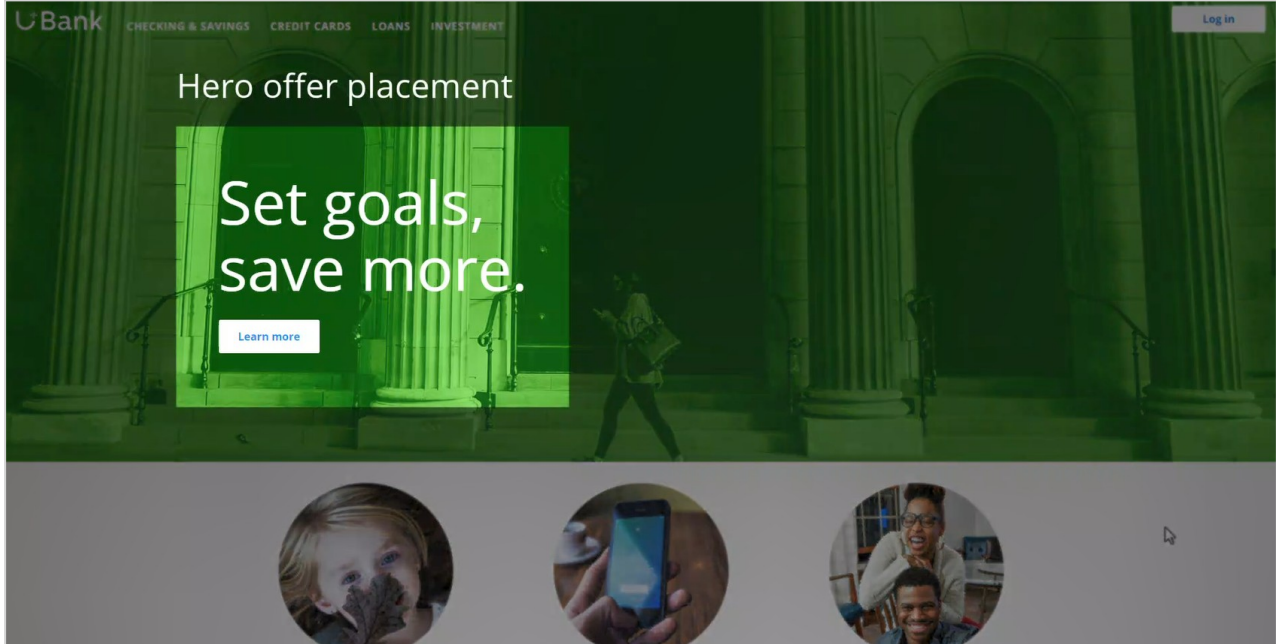


U+ is a retail bank that wants to use its website as a marketing channel to improve One-to-one Customer Engagement, drive sales, and deliver next best actions in real time.

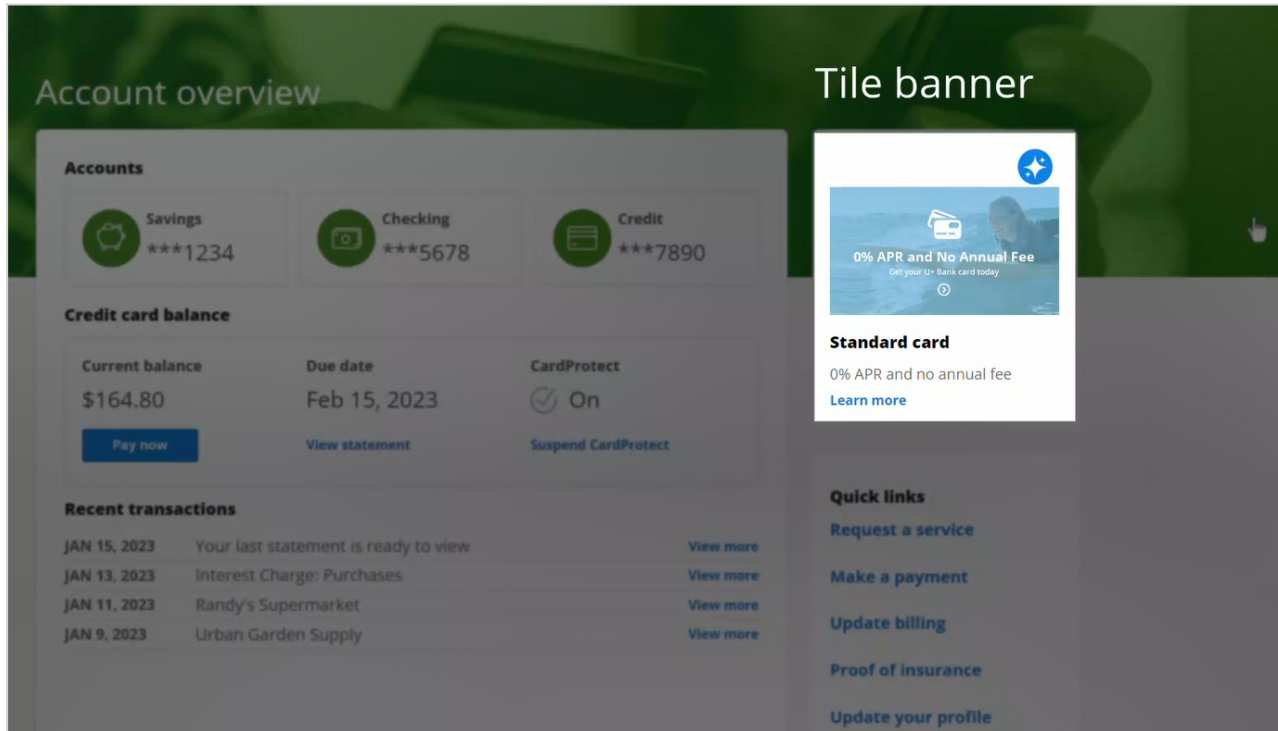
The bank has decided to use Pega Customer Decision Hub™ to recommend more relevant banner ads to its customers when they visit the website.

When visiting the U+ Bank website, Troy, a customer, can see banner ads on various pages. For example, on the home page, U+ displays a hero banner at the top of the page, which is typically a larger image with larger typeface.

Under that banner, there is space to display several tile banners, which are typically smaller.



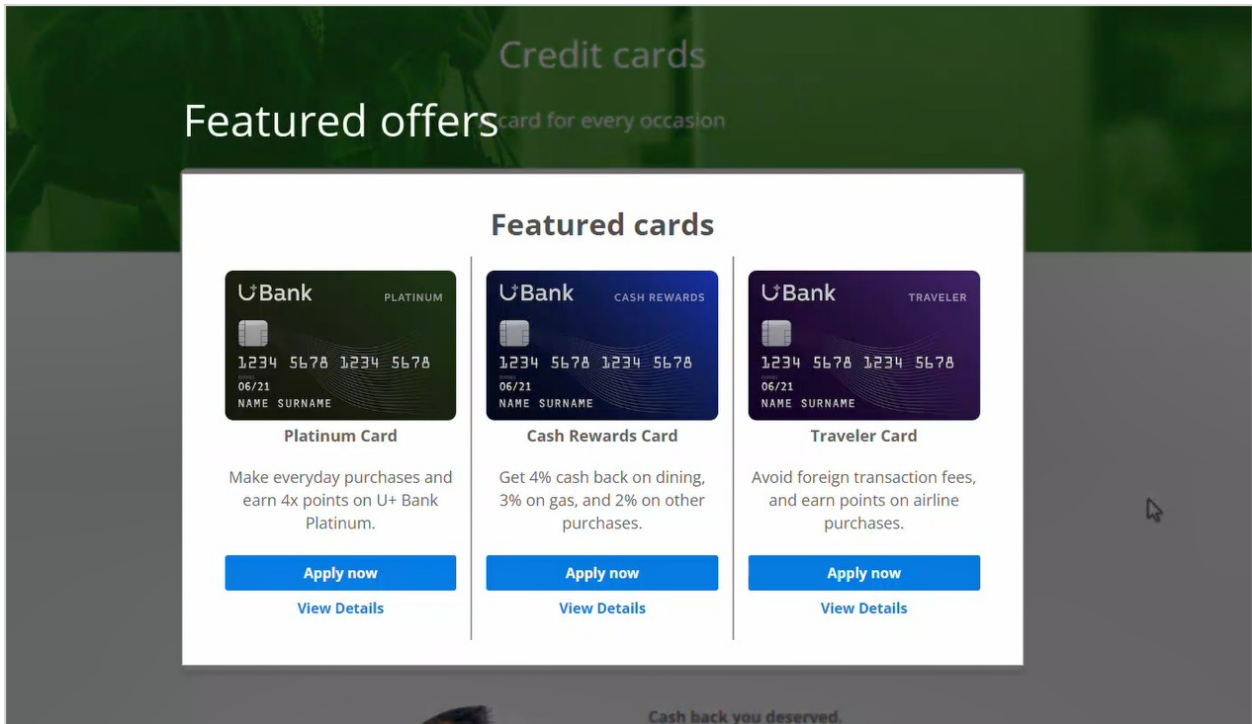
When Troy logs in to his personal portal, he also sees a tile banner on the **Account overview** page.



The main goal of U+ at this stage is to increase customer web engagement. When Troy clicks the **Learn more** link, the action shows his interest.

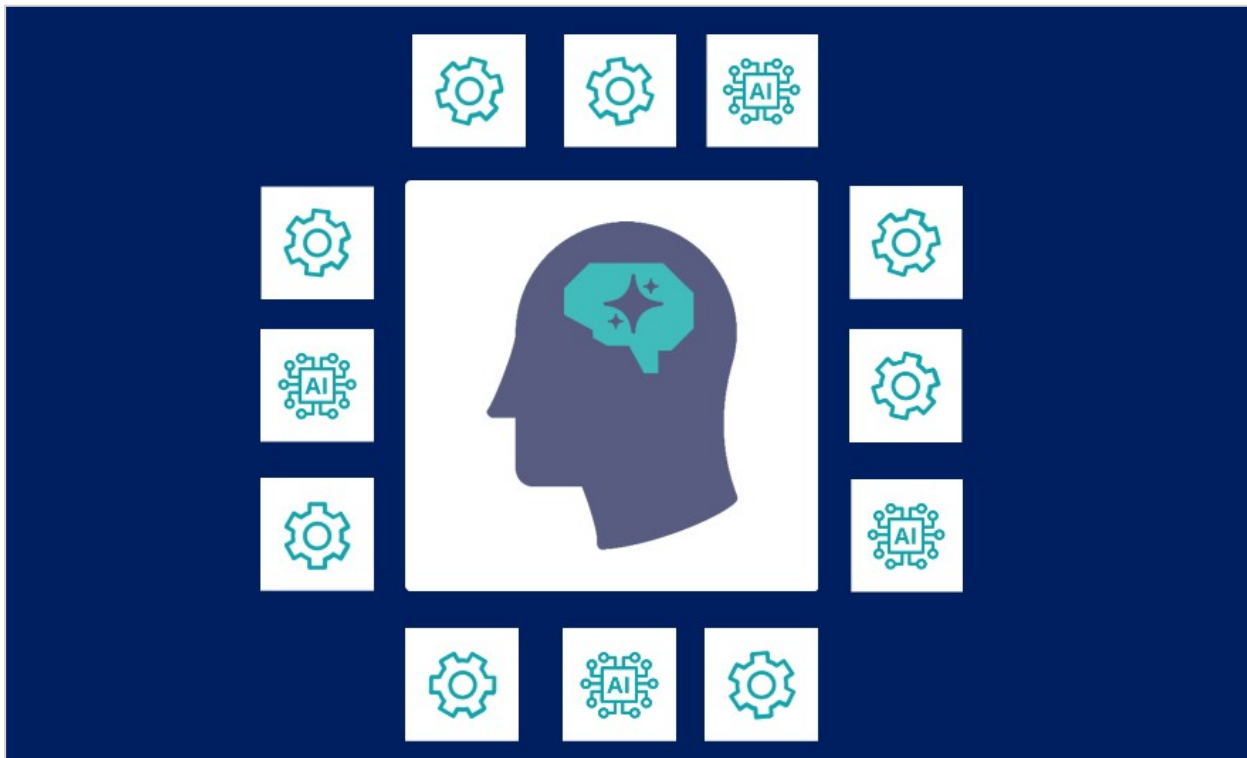
This interaction is recorded as a click-through and helps measure the web engagement of the customer.

After clicking **Learn more**, Troy can see featured credit card offers for which he can apply.

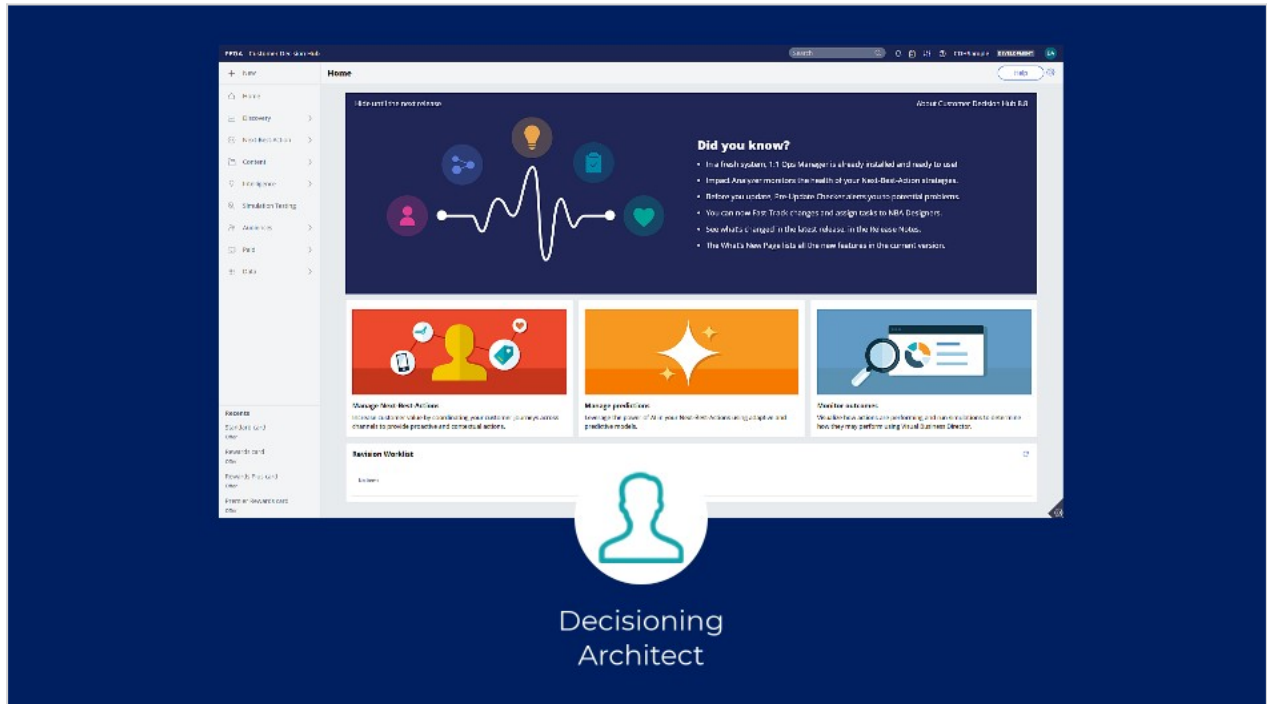


Behind the scenes of the next best actions, the complex decision engine is working to rank and select the best offer to display for each customer who visits the website.

A combination of artificial intelligence (AI) and other business rules determine the options.



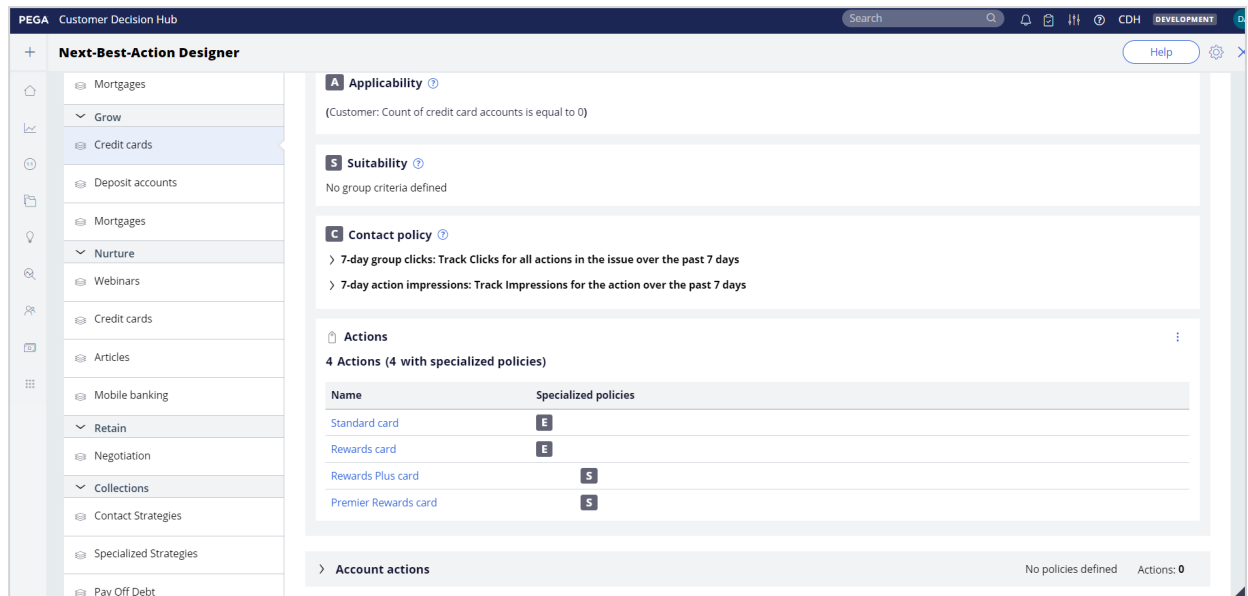
As a Decisioning Architect, you can define the business rules and other settings in Pega Customer Decision Hub by using **Next-Best-Action Designer**.



Next-Best-Action Designer allows you to configure how you want the always-on brain to select the best offer for a customer.

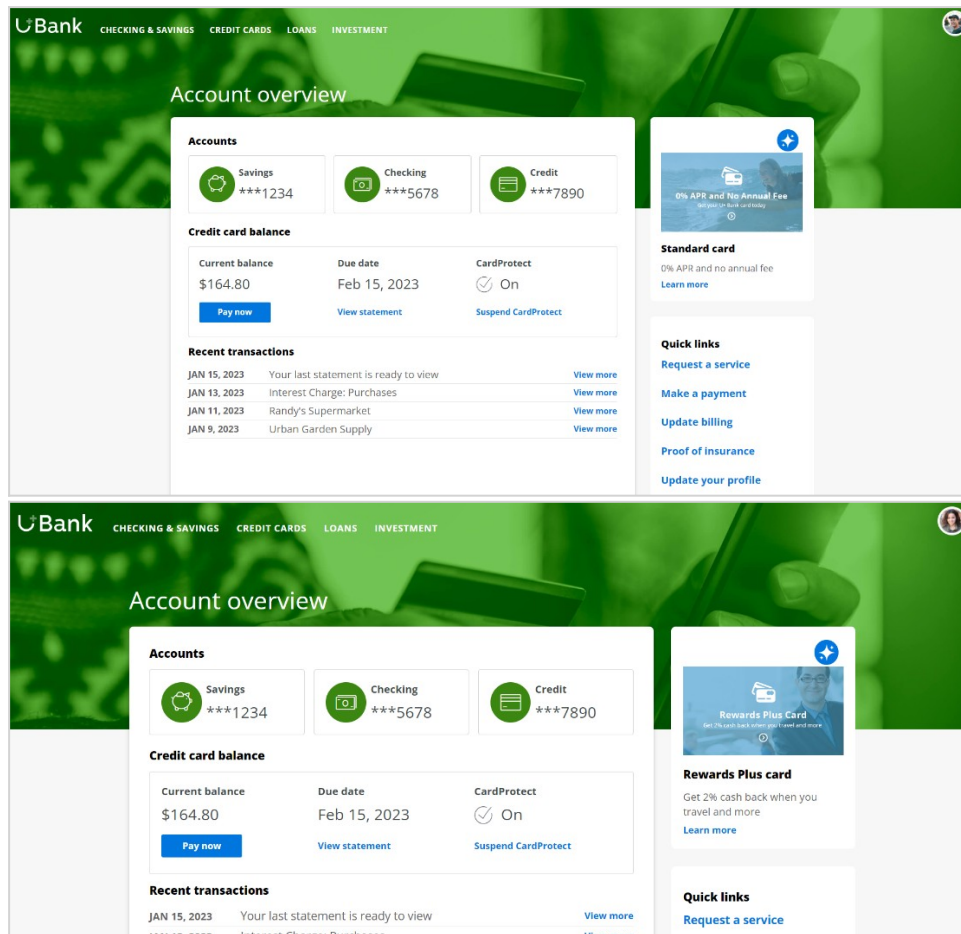
First, to ensure that the offer is displayed on the website, you need to verify that the business structure is in place and that the actions and treatments are defined. You can check that on the **Engagement policy** tab of Next-Best-Action Designer.

In the **Grow** issue and **Credit cards** group, four actions are defined.



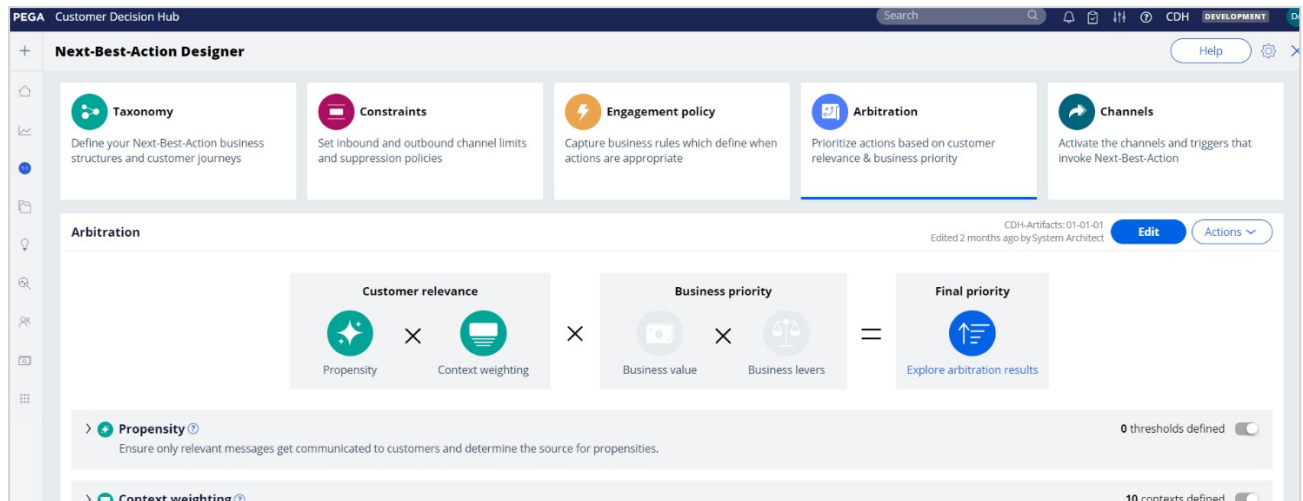
Each action has a set of conditions such as eligibility, applicability, and suitability specified. These conditions are engagement policies, and they qualify an offer or a group of offers for a customer. As a result, customers see only the offers which the organization believes they should receive.

For example, when Troy logs in, he sees the Standard Card, but this offer is not applicable for Barbara, so it is never displayed; instead, she sees the Rewards Plus Card.



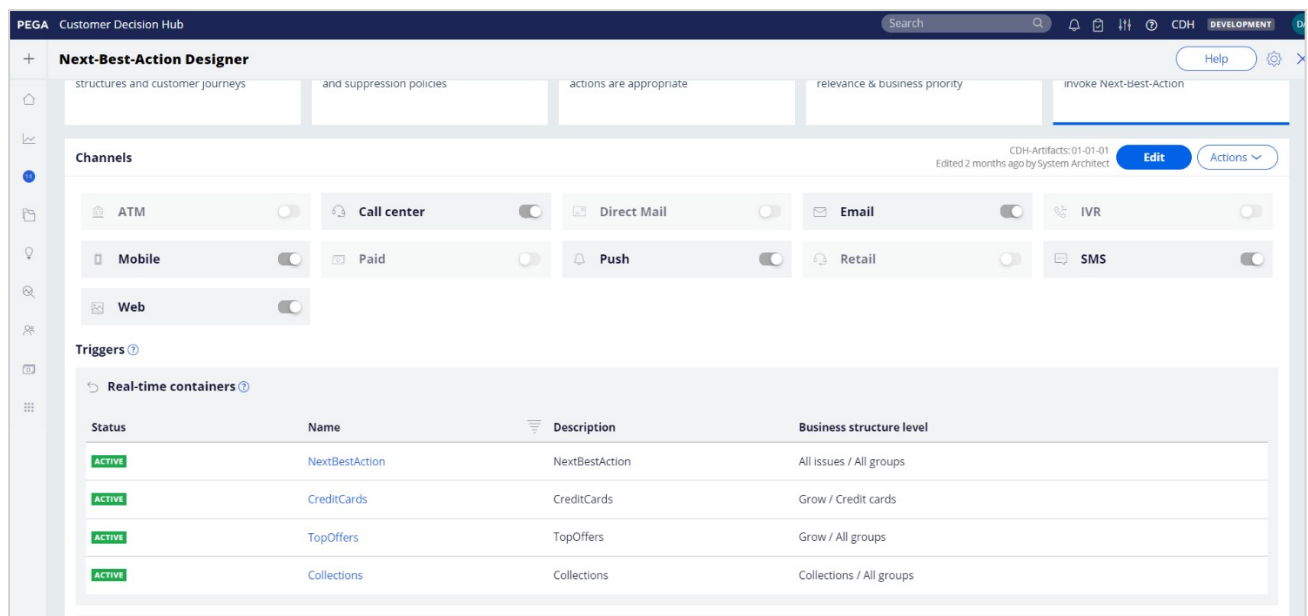
After the engagement policies have "whittled down" the total possible offers to a few, Customer Decision Hub uses arbitration to choose the top offer based on what is relevant for the customer right now.

Arbitration aims at balancing customer relevance with business priorities. Specifically, propensity, context weighting, business value, and business levers have numerical values. The system then uses a simple formula to arrive at a prioritization value, which determines the selection of the top offer.

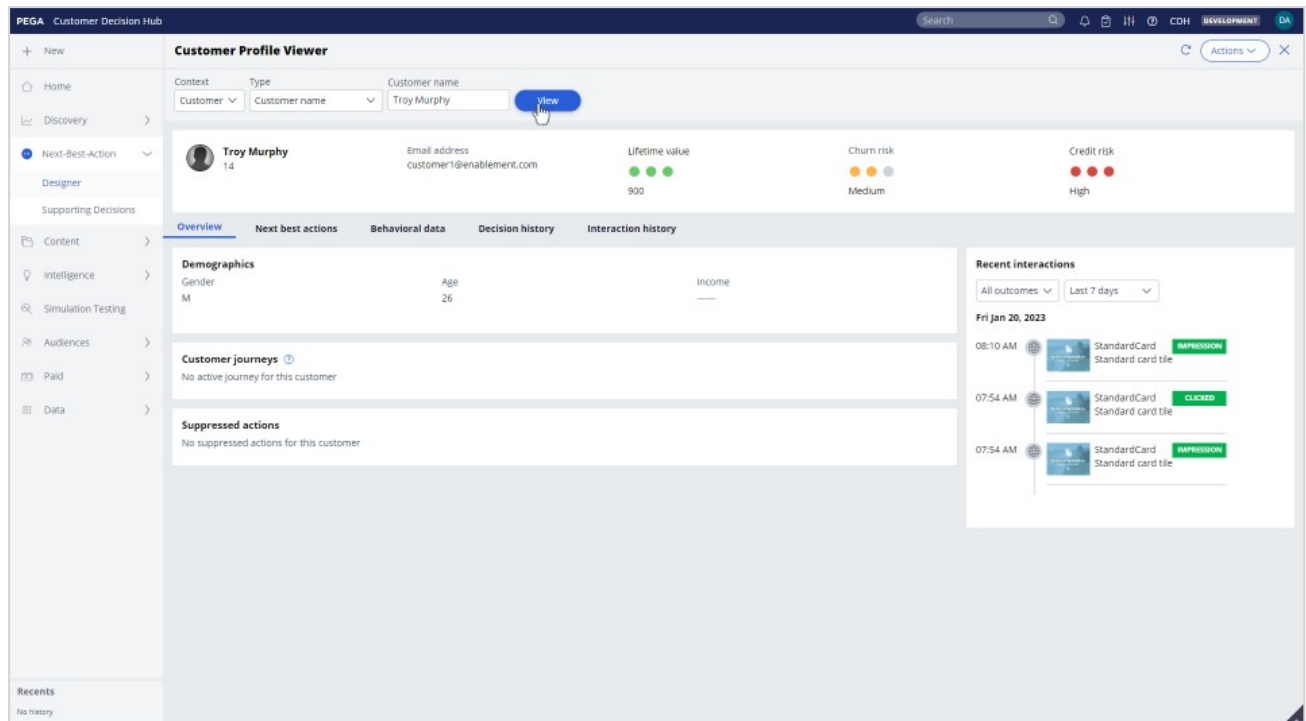


Additional configurations are required, such as enabling a web channel and adding a real-time container, to present the offer on the website. Both settings are configurable on the **Channels** tab of Next-Best-Action Designer.

A real-time container is a service that manages communication between Customer Decision Hub and external channels. It fetches the data configured in Customer Decision Hub and makes it possible to display it on a website.



The recent Troy interaction that Customer Decision Hub captured is now visible in Customer Profile Viewer. You can observe whether the interaction was an impression or a click.



On the **Next best actions** tab of the Customer Profile Viewer, you can see the next-best-action results based on the provided input parameters (for example, inbound direction and a web channel).

In the action results table, you can observe that two out of four credit cards were filtered out, which means that they will not be presented to Troy.

You have access to exclusive Pega GenAI™ capabilities if you are on Pega Cloud. After you view the next-best-action decisions for a customer, you can use the AI Insight feature, which uses Pega GenAI™ technology, to better explain the results that are displayed in the table.

Enabling Pega GenAI, results in changes to the UI of Customer Profile Viewer. The fields marked with the Polaris icon give you access to the AI Insight feature.

AI Insight



The Grow - Creditcards Issue Group has a total of 4 candidate Offers. Out of these, 2 actions passed and 2 actions were filtered out. The most occurring filter reason is "Excluded by suitability", which filtered out 2 actions.

Group Fields Default Export complete report

| | Issue | Group | Name | Treatment | Channel | Priority | IA Test name | Rank | Results |
|--|-------|-------------|--------------------|---------------------------|---------|----------|--------------|------|----------|
| | Grow | Creditcards | RewardsPlusCard | Rewards Plus card tile | Web | 26.36 | | 1 | FILTERED |
| | Grow | Creditcards | PremierRewardsCard | Premier Rewards card tile | Web | 17.27 | | 2 | FILTERED |
| | Grow | Creditcards | RewardsCard | Rewards card tile | Web | 4.06 | | 3 | PASSED |
| | Grow | Creditcards | StandardCard | Standard card tile | Web | 3.50 | | 4 | PASSED |

After processing the results, the AI Insight provides the summary for the tested configuration. In this example, you receive a clear explanation that there are four candidate offers for Troy. However, only 2 actions passed, and 2 actions were filtered out due to the Suitability conditions.

By clicking on the Polaris icon for each row in the Results column, you can access an explanation of the action results in the Action results explanation window, specific to the action.

| Name | Treatment | Channel | Priority | IA Test name | Rank | Results |
|--------------------|---------------------------|---------|----------|--------------|------|----------------------------------------------------------------------------------------------|
| RewardsPlusCard | Rewards Plus card tile | Web | 26.36 | | 1 | FILTERED  |
| PremierRewardsCard | Premier Rewards card tile | Web | 17.27 | | 2 | FILTERED  |
| RewardsCard | Rewards card tile | Web | 4.06 | | 3 | PASSED |
| StandardCard | Standard card tile | Web | 3.50 | | 4 | PASSED |

In this example, you will learn that the RewardsPlusCard is filtered out due to the suitability condition.

Action results explanation GENERATED USING AI ×

Grow / Creditcards / RewardsPlusCard / Rewards Plus card tile FILTERED

The offer you mentioned, **RewardsPlusCard**, is currently being filtered out due to the reason **"Excluded by suitability"**. This means that the offer does not meet the required criteria or properties to be delivered to the customers.

To make this offer pass and be delivered to the customers, you need to address the suitability issue. The specific reason for the exclusion is not provided in the information you provided, so it would be helpful to investigate further to determine the exact criteria that are not being met.

Once you have identified the specific criteria, you can take the following probable approach to make the offer pass:

1. Review the properties of the offer and compare them to the desired criteria.
2. Identify any gaps or discrepancies between the offer properties and the required criteria.
3. Make necessary adjustments to the offer properties to align them with the desired criteria.
4. Ensure that the adjusted offer properties meet the suitability requirements.
5. Test the modified offer to confirm that it now passes the suitability criteria.

By following this approach, you can increase the chances of the offer being delivered to the customers based on the desired properties.

Learn more about:
[Excluded by suitability](#)

You can explore the reasons behind this decision by utilizing the "Filtering by feature" option. The table displaying the decision results has been enhanced with multiple categories that might serve as the underlying cause for excluding certain actions.

You can for example, see how the engagement policies are used or why a customer does not receive an action.

To summarize, when visiting the bank's website, the customer can see the next best action that the "always on" centralized decision management "brain" of Customer Decision Hub selected from a set of actions defined and configured by the Decisioning Architect.

You have reached the end of this video.

Arbitration fundamentals

Description

Customers might still qualify for more than one action after you apply engagement policy rules. Learn how every next best action weighs customer needs against business objectives to optimize decisions based on the priorities that the business sets.

Learning Objectives

- Describe what action arbitration is and how it works.
- Explain how the system considers customer needs and business objectives during arbitration.
- Prioritize actions based on AI.

Action arbitration

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

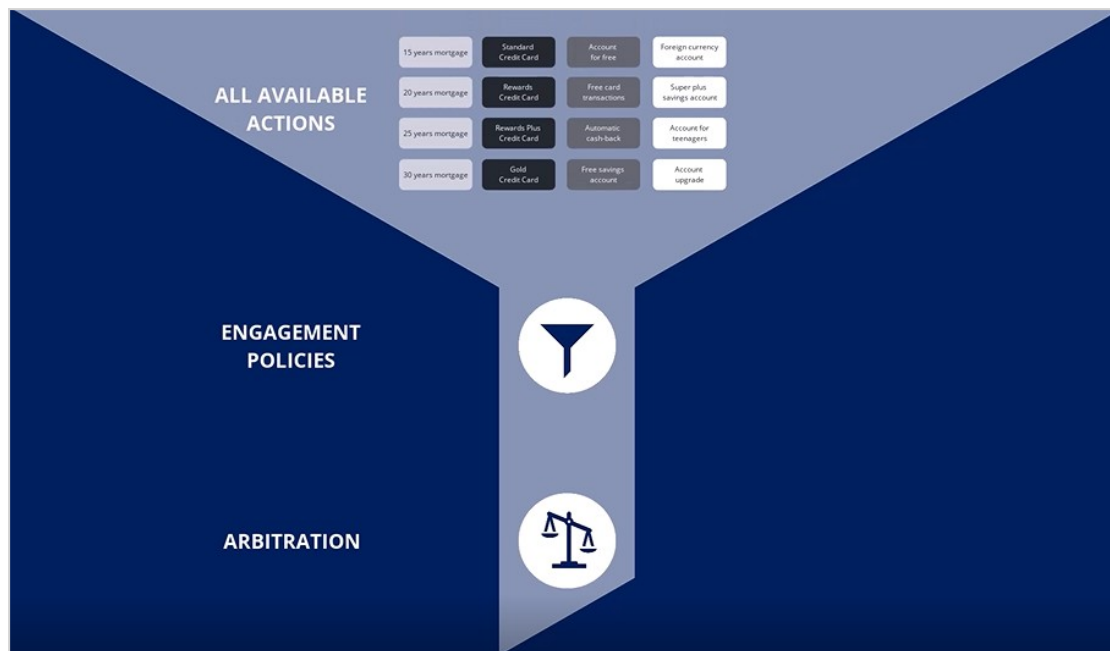
Transcript

This video explains the concept of action arbitration in Pega Customer Decision Hub.

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



U+, a retail bank, wants to avoid offering random actions to its customers, so it uses Pega CDH to rank and select the next best actions for every customer. All the actions from the Bank's offer move through several steps that whittle them down until the Next Best Action is selected.



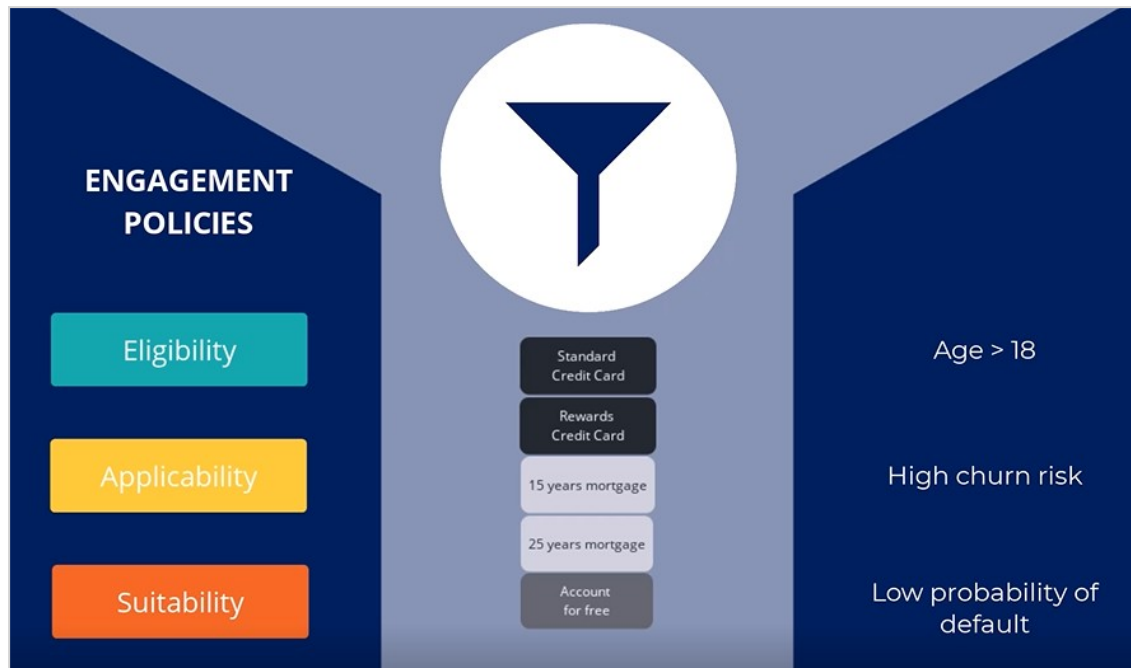
The process starts with the catalog full of actions that the organization can offer to its customers. These actions belong to various issues and groups.

The first step is to apply the Engagement Policies: Eligibility, Applicability, and Suitability conditions.

Eligibility rules are used to determine whether customers are eligible for an action. Users must meet the condition for CDH to consider the action eligible. An example of an eligibility condition is the customer's age. A customer can be offered a credit card only if they are 18 years old or older.

Applicability rules are used to limit what to offer, based on a customer's current situation. For example, the bank wants to show a retention offer, instead of a credit card offer, to customers who are likely to churn in the near future.

Suitability rules are used to define whether an offer is appropriate for a customer. For example, if a customer is in debt and has a lot to pay off, the bank does not want to offer them a 30-year mortgage as it would not be empathetic.



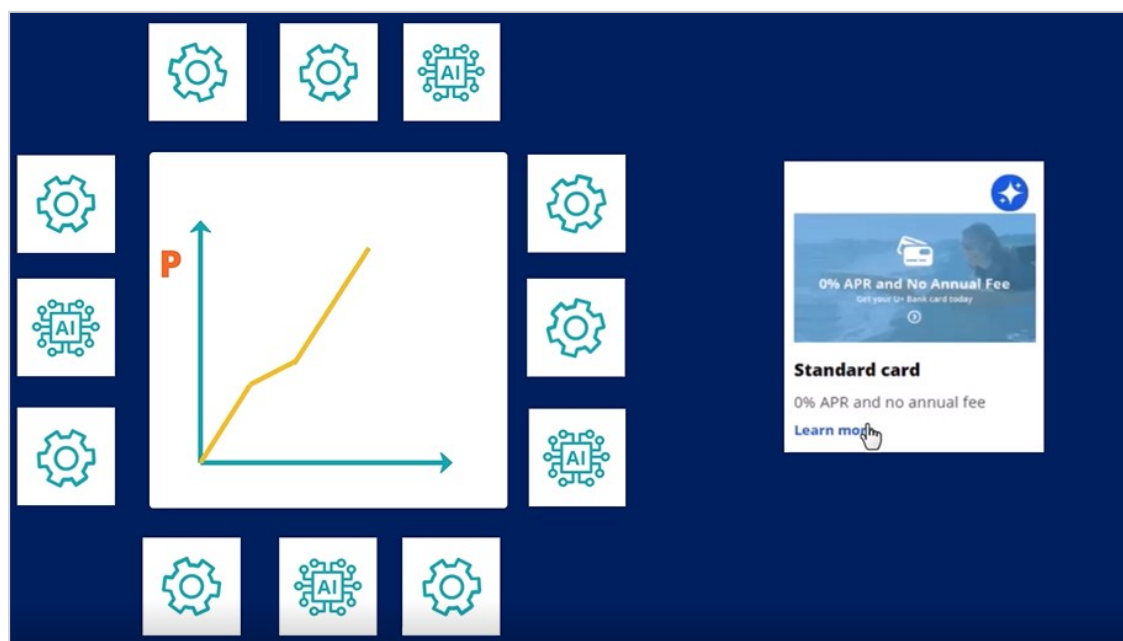
The initial catalog of actions has been narrowed down by engagement policies. These engagement policies are a combination of business rules, for example, certain age requirements for a loan or some product compatibility rules, and predictive models which help predict customer behavior as customer churn or probability of default. These predictive models are created by data scientists in Pega, or other tools familiar to data scientists like Python, R, and H2O.AI.

Before being presented to customers, the remaining actions go through a final stage known as the arbitration stage. This stage focuses on selecting and prioritizing the best actions that are most relevant for the customer at the present time. Arbitration balances customer relevance with business priorities using four components: **Propensity, Context Weighting, Business Value,** and **Business Levers**, each represented by numerical values.



Propensity is the predicted likelihood of positive behavior, such as the likelihood of a customer accepting an offer.

The propensity value is calculated by AI and it is the foundation of the arbitration process. The higher the likelihood of a customer accepting an offer, the higher the Propensity value for that offer. For Example, when a customer is eligible to receive a Standard Credit Card and clicks the Standard Credit card offer on the Bank's website the propensity of this action increases.



The AI is driven by adaptive models, self-learning mathematical models that use machine learning to make calculations. Adaptive models are a sub-group of predictive models that continuously adapt to new data as it becomes available. This means that the models are updated incrementally in real-time based on incoming data.

The Customer Decision Hub is configured to calculate the propensity for each treatment. For the web treatment, **Web_Click_Through_Rate** is the out-of-the-box adaptive model. It predicts the likelihood of a customer clicking on a banner, which is considered a positive behavior.

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, even if they are eligible for other offers.

Business 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, a 25-year mortgage is more profitable than a 15-year mortgage. So, in a situation where a customer is eligible for both plans, the 25-year mortgage will be ranked higher because of its higher business value.

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. However, 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.

Pega AI considers all four components to select the top offer for a customer. A simple formula $P * C * V * L$ is used to arrive at a prioritization value, which is used to select the top actions. The action with the highest priority will be presented to a customer.



In the current example, there are 5 actions that made it until the arbitration phase.

Assume the AI generates a propensity value for each of the actions which is a value between 0 and 1.

Each action has a context weight set, which is a percentage value between 0% and 100%, business value in dollars, and business lever value in a percentage between 0% and 100%.

Using the priority formula PCVL, with all of these values taken into account, we end up with a computed priority. Finally, the action with the highest priority is selected. In this case, it is a Standard Credit Card.

| | PROPENSITY | CONTEXT | BUSINESS VALUE | BUSINESS LEVERS | PRIORITY |
|----------------------|------------|---------|----------------|-----------------|----------|
| Standard Credit Card | 0.45 | 5% | \$186 | 25% | 5.23 |
| Rewards Credit Card | 0.3 | 5% | \$238 | 25% | 4.46 |
| 15 years mortgage | 0.25 | 2% | \$665 | 10% | 3.6 |
| 25 years mortgage | 0.2 | 2% | \$965 | 10% | 4,25 |
| Account for free | 0.4 | 10% | \$56 | 5% | 0.58 |

In summary, arbitration is used to select and prioritize the best actions that are most relevant for the customer at the present time. Arbitration balances customer relevance with business priorities using the formula $P * C * V * L$. The top actions are selected based on the result of this multiplication – the prioritization value.

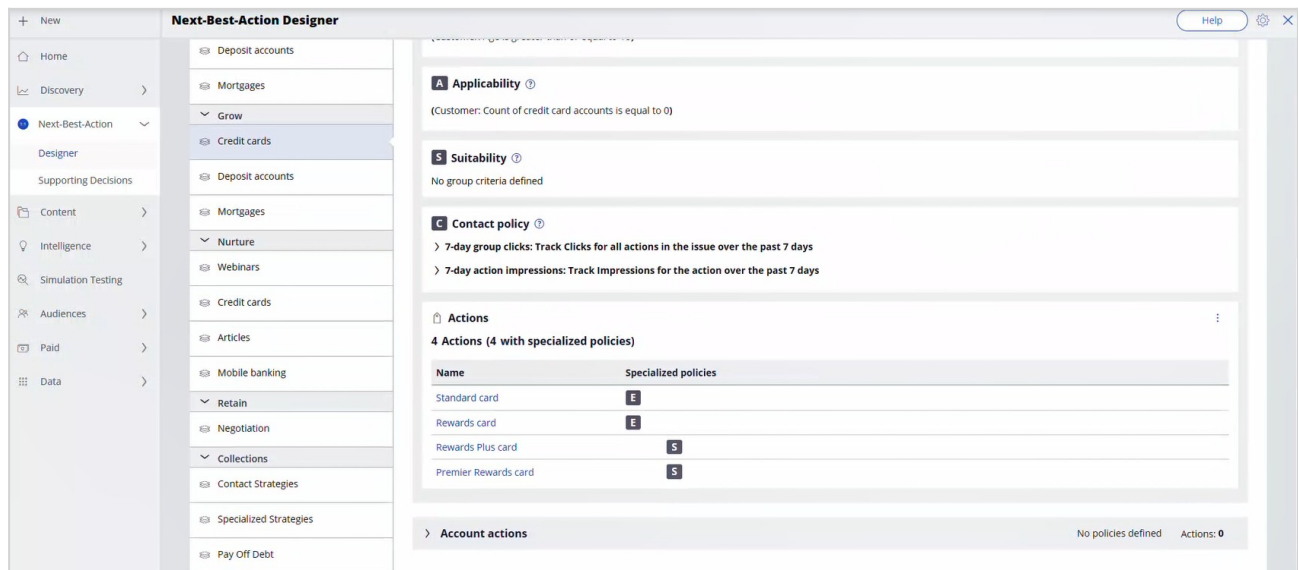
Action prioritization with AI

Explore how AI-based arbitration works and how AI predicts customer behavior. Arbitration aims to balance customer relevance with business priorities. Pega Customer Decision Hub™ uses a formula to arrive at a prioritization value and select the top actions. The formula uses the propensity value that AI calculates. Propensity is the predicted likelihood of positive behavior, such as the likelihood of a customer accepting an offer.

Transcript

This demo shows you how AI-based arbitration works and explains how AI predicts customer behavior.

U+ Bank, a retail bank, uses Pega Customer Decision Hub to display marketing offers to customers on its website. The bank wants to display more relevant offers to customers based on their behavior. There is an initial set of actions that belong to **Grow** Issue and **Credit Cards** Group created in Customer Decision Hub.



After filtering by Engagement Policies, customer Troy is eligible for two credit card offers – Standard Card and Rewards Card. When he logs into the bank’s website, he sees the **Standard Card** offer. When you click the **Polaris** icon next to the card offer, you can examine the arbitration details, such as propensity value and priority value.

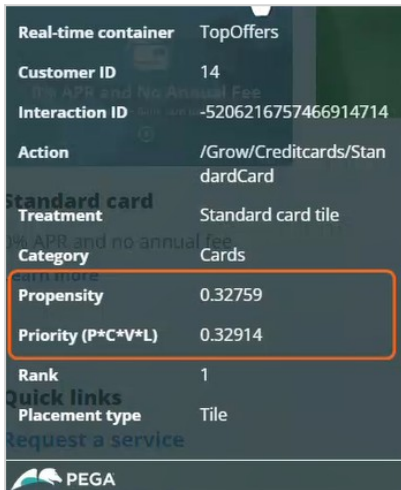
The screenshot shows a bank's account overview page. At the top, there are navigation links for 'CHECKING & SAVINGS', 'CREDIT CARDS', 'LOANS', and 'INVESTMENT'. The main heading is 'Account overview'. Below this, there are three account cards: 'Savings' with a balance of ***1234, 'Checking' with a balance of ***5678, and 'Credit' with a balance of ***7890. A 'Credit card balance' section shows a current balance of \$164.80, a due date of Mar 15, 2023, and CardProtect status 'On'. Below this is a 'Recent transactions' table with four entries from February 2023. On the right, a dropdown menu is open, showing details for a 'Standard card' offer, including 'Propensity' (0.32759) and 'Priority (P*C*V*L)' (0.32914), which is highlighted with a red box.

The offer presented to the customer is the one with the highest priority that the Pega Customer Decision Hub selects based on the arbitration settings. You define the Arbitration settings in the Next-Best-Action Designer of Customer Decision Hub. The purpose of arbitration aims is to balance customer relevance with business priorities. The system uses four components of arbitration, **Propensity (P)**, **Context weighting (C)**, **Business value (V)**, and **Business levers (L)**, represented by numerical values, to achieve this balance. With the $P \times C \times V \times L$ formula, Customer Decision Hub arrives at a prioritization value, which the system uses to select the top offers.

The screenshot shows the 'Next-Best-Action Designer' interface. At the top, there are five main sections: 'Taxonomy', 'Constraints', 'Engagement policy', 'Arbitration', and 'Channels'. The 'Arbitration' section is selected and expanded, showing a formula for calculating 'Final priority'. The formula is: $\text{Propensity} \times \text{Context weighting} \times \text{Business value} \times \text{Business levers} = \text{Final priority}$. Below the formula, there are four sections: 'Propensity' (0 thresholds defined), 'Context weighting' (10 contexts defined), 'Business value' (0 thresholds defined), and 'Business levers' (0 levers defined).

Typically, the propensity for every action starts at 0.5 or 50 percent, the same as the flip of a coin. This value is the default because the AI has no past customer behavior on which to base its predictions. After every interaction, the propensity increases or decreases accordingly.

The **Standard Card** that is displayed for the customer Troy shows the propensity and priority equal 0.32, and it means that the system captured several interactions before.



Consider the following interaction as an example: Troy logs in multiple times and sees the same Standard Card offer. On the first three visits, Troy ignores the offer. When he visits the website the fourth time, he clicks the offer to learn more.

In Customer Profile Viewer, you can examine Troy's interactions, the decision history, and the next best actions. First, load the decision history for the current use case to view the interactions recorded. In the table, the propensity changes after the system records each interaction. You can examine that the propensity decreases because Troy ignored the offer three times. Then, after he clicked **Learn more**, the propensity increased.

Customer Profile Viewer

Context: Customer ID 14

Troy Murphy (14) | Email: customer1@enablement.com | Lifetime value: 900 | Churn risk: Medium | Credit risk: High

Decision history

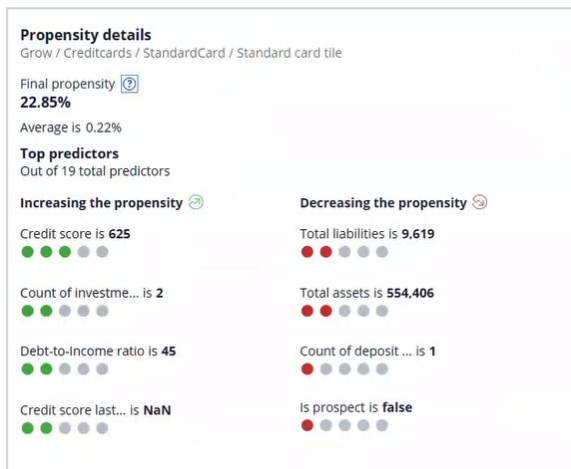
Explore the decisions that were made for this customer by Customer Decision Hub. Loading all decisions may take some time because they are stored externally.

Load all decisions last loaded on 2/22/23 10:01 AM

| Decision time | Name | Treatment | Group | Issue | Direction | Channel | Journey | Journey stage | Final propensity | Context weight | Value | Total lever weight | Priority | Rank |
|------------------|--------------|--------------------|-------------|-------|-----------|---------|---------|---------------|------------------|----------------|-------|--------------------|----------|------|
| 2/22/23 9:57 ... | StandardC... | Standard card tile | Creditcards | Grow | Inbound | Web | | | 0.3400 | 1.00 | 35.00 | 1.00 | 0.34 | 1 |
| 2/22/23 9:57 ... | StandardC... | Standard card tile | Creditcards | Grow | Inbound | Web | | | 0.3158 | 1.00 | 35.00 | 1.00 | 0.32 | 1 |
| 2/22/23 9:56 ... | StandardC... | Standard card tile | Creditcards | Grow | Inbound | Web | | | 0.3342 | 1.00 | 35.00 | 1.00 | 0.33 | 1 |
| 2/22/23 9:56 ... | StandardC... | Standard card tile | Creditcards | Grow | Inbound | Web | | | 0.3442 | 1.00 | 35.00 | 1.00 | 0.34 | 1 |

The configuration of the AI model behind these offers treats impressions that do not result in a click as a negative outcome. As a result, the propensity, and therefore the priority of that offer, decreases. The propensity and priority of the not-clicked offer keep decreasing until the model records a click (positive outcome). However, if Troy clicks the offer, the propensity and priority increase. Next, view the next-best-action recommendations to learn more about the action for which Troy qualifies. For the current use case, the direction is **Inbound**, and the channel is the **Web**. TopOffers is the real-time container service that manages communication between the Customer Decision Hub and the website of the bank.

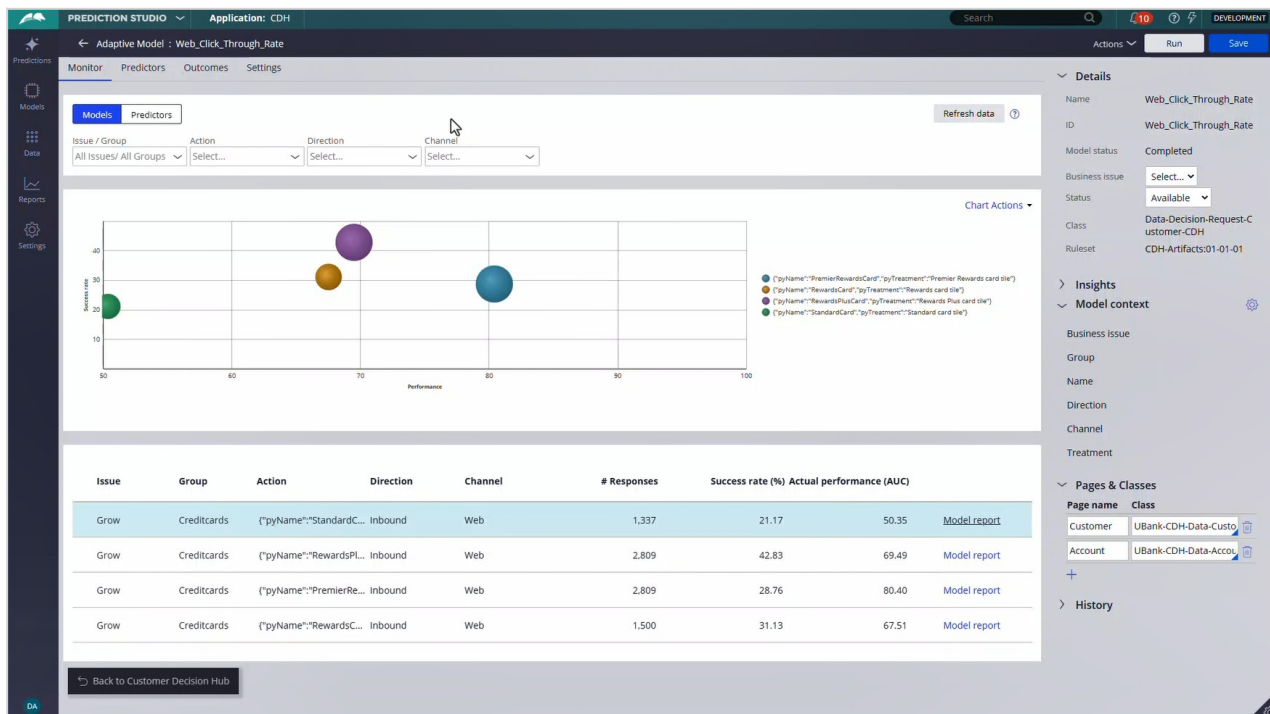
Based on the engagement policy rules, Troy is eligible for two credit card offers: the **Standard card** and the **Rewards card**. In Customer Profile Viewer, you can examine the arbitration factors using one of the following options: **Explain prioritization, Explain weighting, or Explain propensity**. In the **Explain propensity** view, you can check the influencing factors of a specific action for which Troy qualifies. The factors are the best-performing predictors that contribute positively to the propensity of the offer and the predictors that contribute negatively to the propensity of the offer.



Customer Decision Hub calculates the propensity for each treatment. To understand how this works, study the **Analytical model** behind a treatment. This pop-up window provides a summary of the AI behind the treatment. In Customer Decision Hub, the AI that determines the propensity for positive behavior towards an action or treatment is an adaptive model.

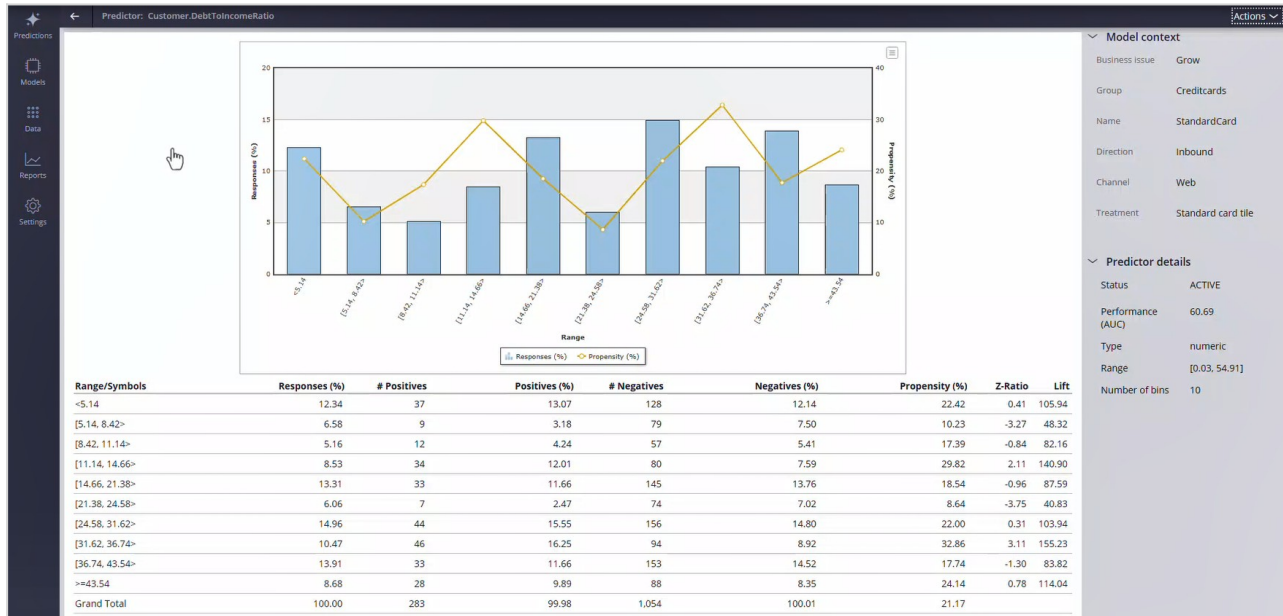


From here, you can navigate to the adaptive model in Prediction Studio, a workspace used to manage AI models. On the landing page of the Prediction Studio, every action is represented as a separate bubble on the bubble chart. Under the chart, separate **Model reports** for every action are available.



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. In the **Predictor** report, you can examine the

performance of individual predictors. For example, you can see how the system automatically groups the values of a numeric predictor into bins and how the propensity to accept varies across the bins.



The behavior of one customer influences the propensity calculation for other customers with a similar profile.

- You have reached the end of this video. You have learned:
- How customer behavior influences the Propensity value.
- Where in CDH you can update the Arbitration settings.
- How customer behavior and next best actions are displayed in Customer Profile Viewer.
- What are the adaptive models, and how to manage them.

Optimizing your next-best-action strategy

Description

Learn how to check the health of Pega Customer Decision Hub™ and improve the effectiveness of your next best actions. Impact Analyzer, Scenario Planner, and Value Finder are optimization tools that provide insight into the performance of your next best actions, identify opportunities for improvement, and help you adjust settings to create higher customer engagement and value capture.

Learning objectives

- Use Impact Analyzer to monitor the performance of your next best actions.
- Use Scenario Planner to simulate “what-if” scenarios to forecast results.
- Use Value Finder to identify underserved customers and take action to improve their experience
- Explain the connection between Impact Analyzer and Scenario Planner.
- Explain the connection between Impact Analyzer and Value Finder.

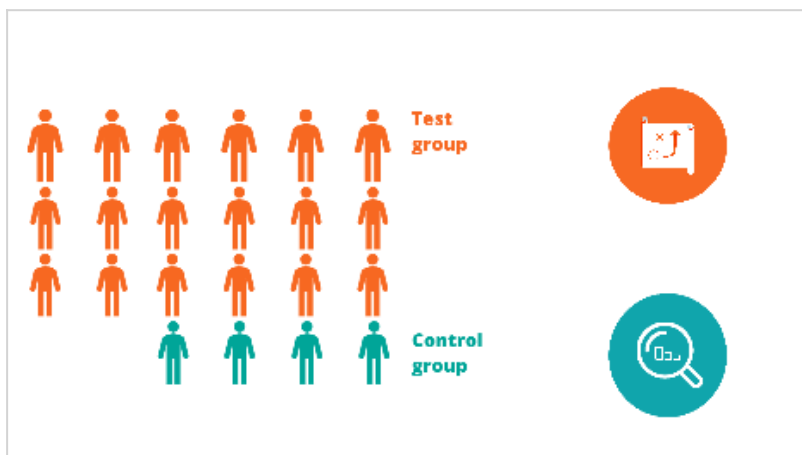
Monitoring the health of the system using Impact Analyzer

Impact Analyzer is a proactive monitoring tool that shows the overall health of your actions and highlights opportunities for improvement. The tool provides insight into the performance of your next best actions through the results of experiments that tell you what actions and configurations are working as expected, and where you can still improve.

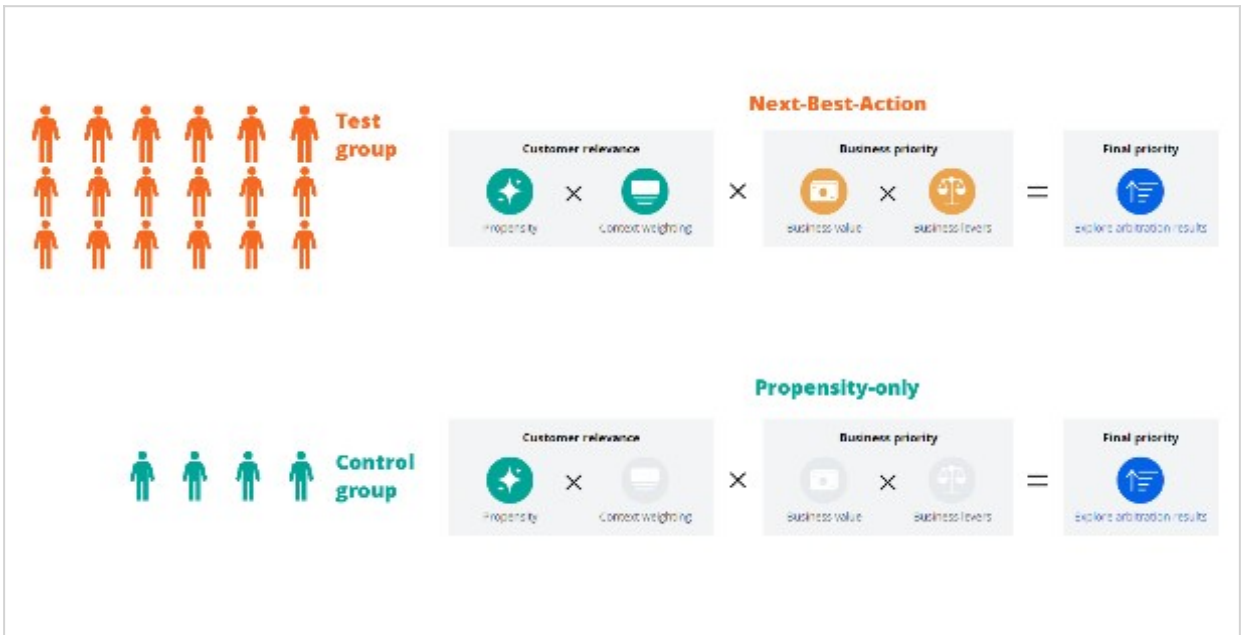
Transcript

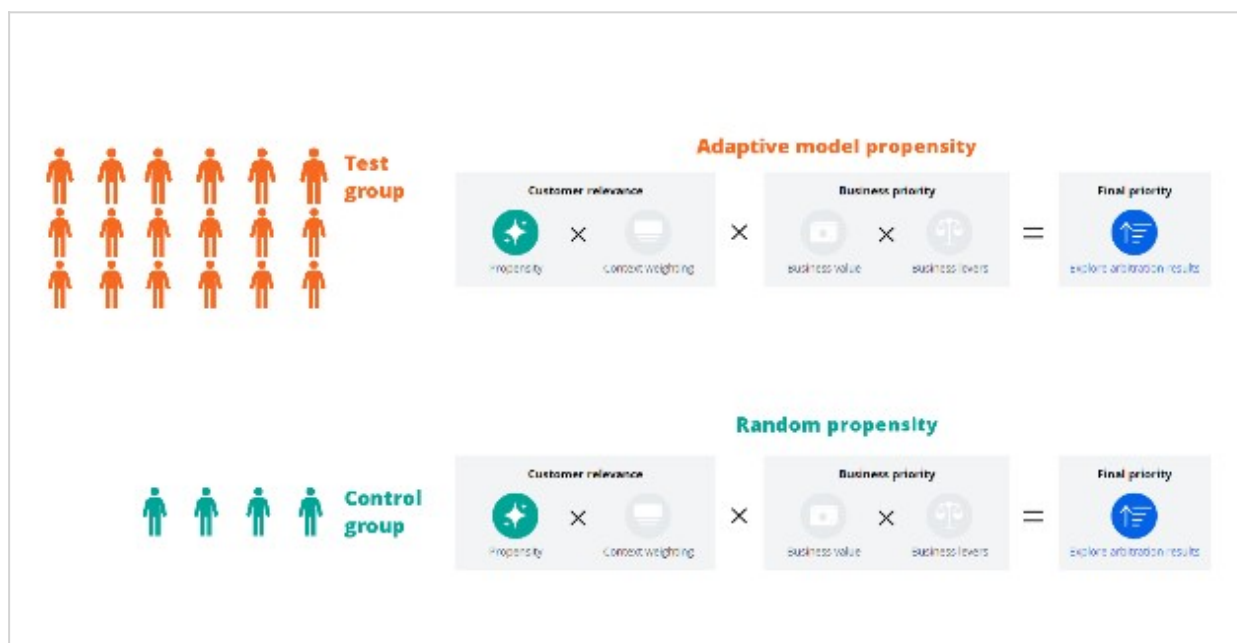
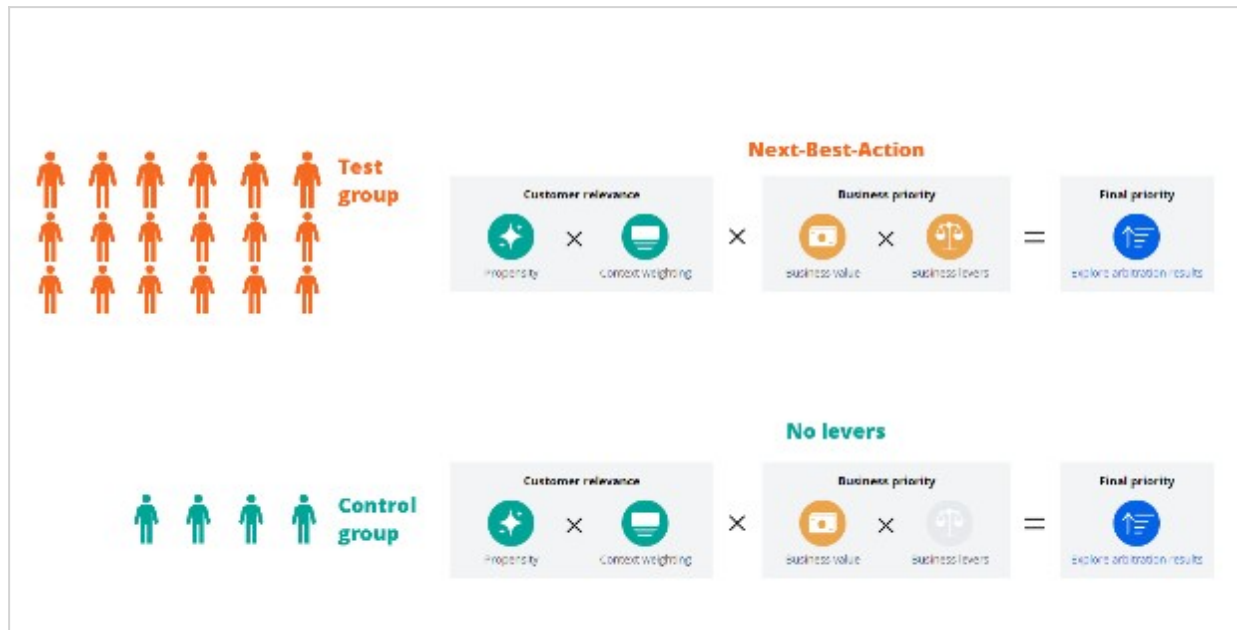
Impact Analyzer is a feature of Pega Customer Decision Hub™ that uses experimentation to track the effectiveness and overall health of next best actions. By utilizing this tool, you can gain insights into the effects of arbitration. Impact Analyzer conducts experiments with alternative prioritization and engagement policy filters on a small control group of customers. This enables you to assess whether or not the next best action is producing a positive effect. In addition to monitoring for basic lift, these control group experiments can also reveal opportunities to optimize and align the next best actions with your business goals.

An experiment is a test with two sets of participants, the test group and the control group, in which the test group receives the originally arbitrated action and the control group receives an alternate action based on the type of experiment.



You can use Impact Analyzer to carry out a variety of tests. For example, you can assess the effectiveness of the next best action against a random relevant action or actions, chosen based on propensity alone. Additionally, you can measure the performance of the next best action when arbitrating with no levers. You can also evaluate the performance of the adaptive model propensity against a random propensity.

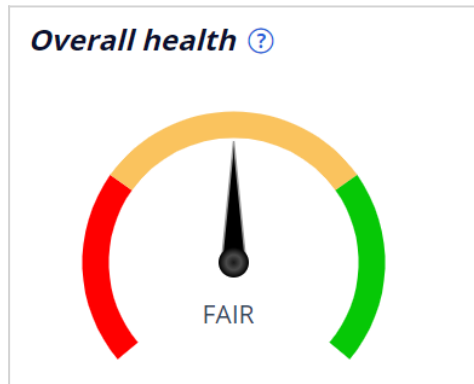




Impact analyzer continuously monitors the health of the next best actions in the experiment, and presents the results in the form of two key performance indicators (KPIs): value lift, and engagement lift. Value lift measures how much a business can make from suggesting certain next best actions to customers, compared to a random relevant action. Engagement lift measures how much more likely customers are to click or accept a suggested next best action, compared to the random relevant action.

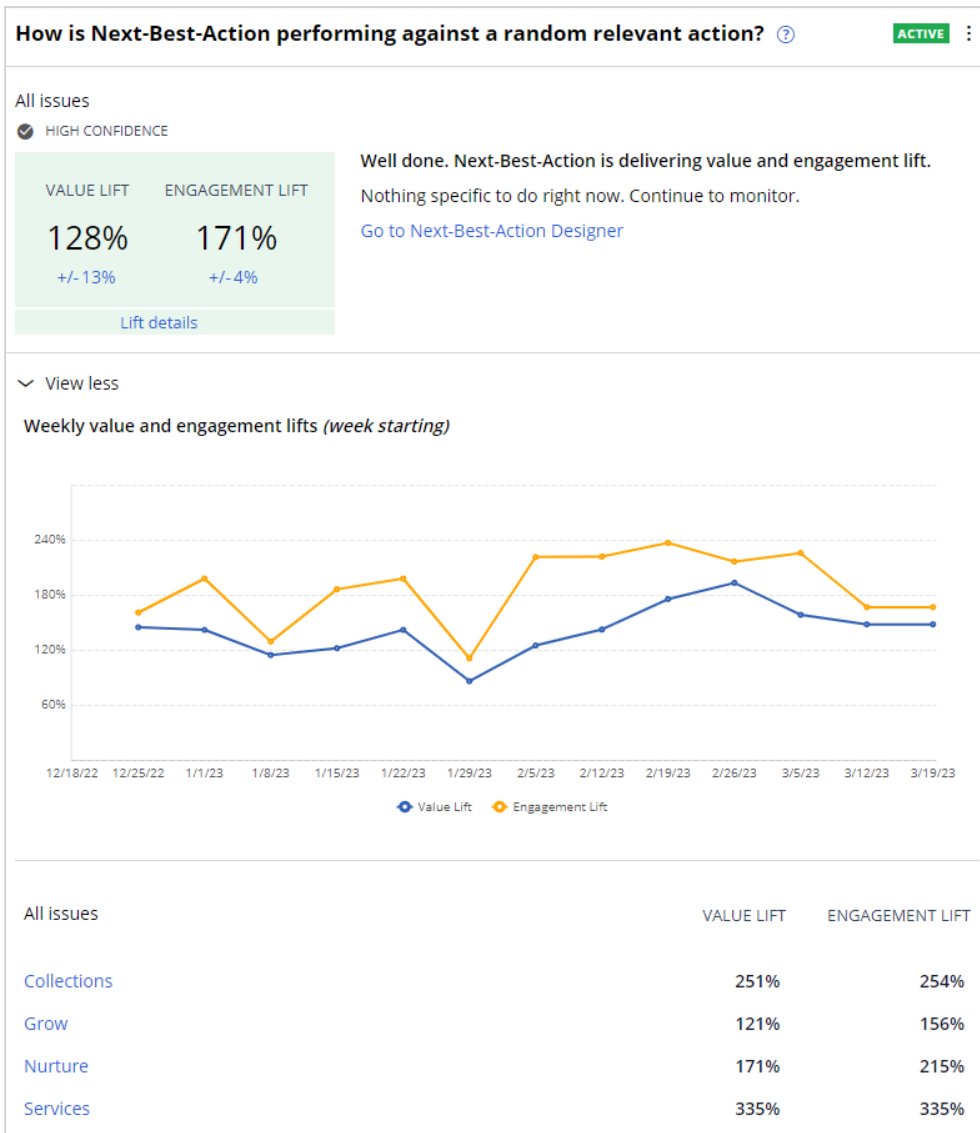
When a next best action is delivering lift, the overall health indicator highlights in green. The middle position of the indicator shows that there is room for improvement to better align

actions to the business. The red highlight [the section on the left] means that something is wrong and needs your attention. The indicator is colored gray when the general health is not available due to insufficient data in one or more active tests.



Impact Analyzer is available under **Discovery** tab in the left menu of Customer Decision Hub.

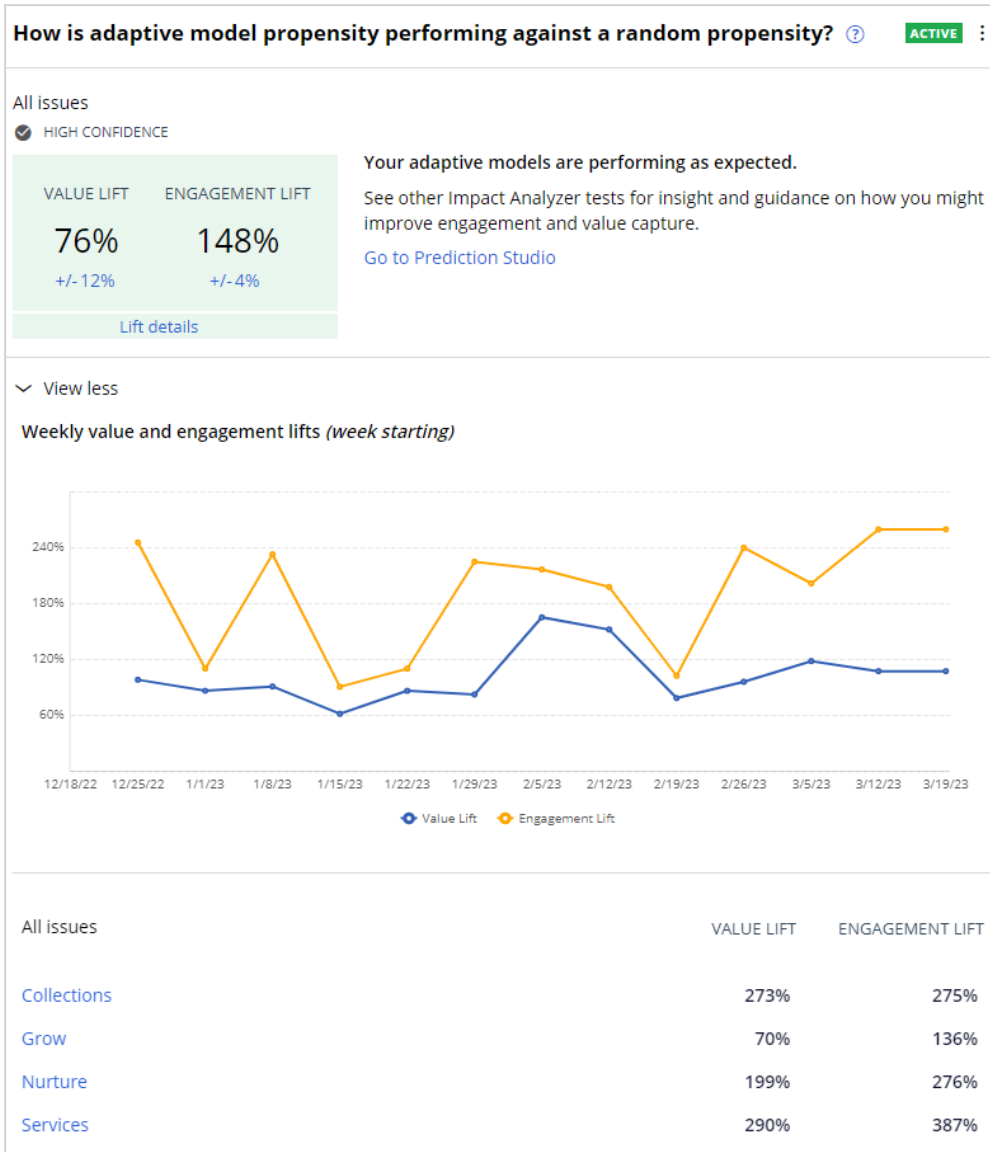
One of the experiments that you can run is called *How is Next-Best-Action performing against a random relevant action?*



This test serves as a baseline check to ensure that the next best action is beating the random relevant action. At the very least, we expect the value lift - and ideally, both the value and engagement lift - to be positive, at the highest level across all issues and groups aggregated. If both value and engagement lifts are negative, there is an issue. This could mean that there is a problem with the underlying adaptive models, or that your engagement policies are too targeted. Another reason might be that your levers are excessively biased, and the next best action lacks the aptitude to optimize engagement or to capture value.

The test widget presents a value lift of 128 percent and an engagement lift of 171 percent. Both values are positive, and the test is highlighted in green.

Another experiment is called *How is adaptive model propensity performing against a random propensity?*



This experiment compares only Pega AI-driven model propensity with no context weight, no business value, and no business levers, against only randomly generated propensity. The experiment is another baseline check to ensure that the adaptive models that a next best action uses are delivering lift over random propensity.

To monitor for basic lift, both presented experiments should be on at all times.

Impact Analyzer offers a range of benefits to its users. One of the most significant benefits is the ability to collect data in real-time, allowing for real-time monitoring and testing of KPIs. Impact Analyzer also enables users to look for opportunities that they may have otherwise missed.

The primary user of Impact Analyzer is the Next Best Actions operations team, who are responsible for ensuring that the system runs optimally. However, the tool brings value to various lines of business, sales, marketing, and Data Scientists.

You have reached the end of this video. You have learned:

- How Impact Analyzer continuously monitors the performance and health of the system.
- How Impact Analyzer conducts experiments by implementing alternative prioritization and engagement policy filters on a small control group of customers, to assess the effectiveness of next best actions.
- How the experiments reveal opportunities to optimize and align next best actions with business goals.

Investigating the effect of business levers in action arbitration

Impact Analyzer is a tool that uses experimentation to monitor the health and effectiveness of next best actions. Through various experiments, Impact Analyzer checks if the next best actions are delivering lift, and identifies opportunities to better optimize and align next-best-action optimization with your business goals. To further analyze such cases, you can use Scenario Planner, which allows you to easily simulate 'what-if' scenarios to accurately forecast results, optimize strategies to hit specific goals, and explore the potential trade-offs of each option. Both Impact Analyzer and Scenario Planner are optimization tools that help you adjust Pega Customer Decision Hub™ settings so that the actions bring higher customer engagement and value capture.

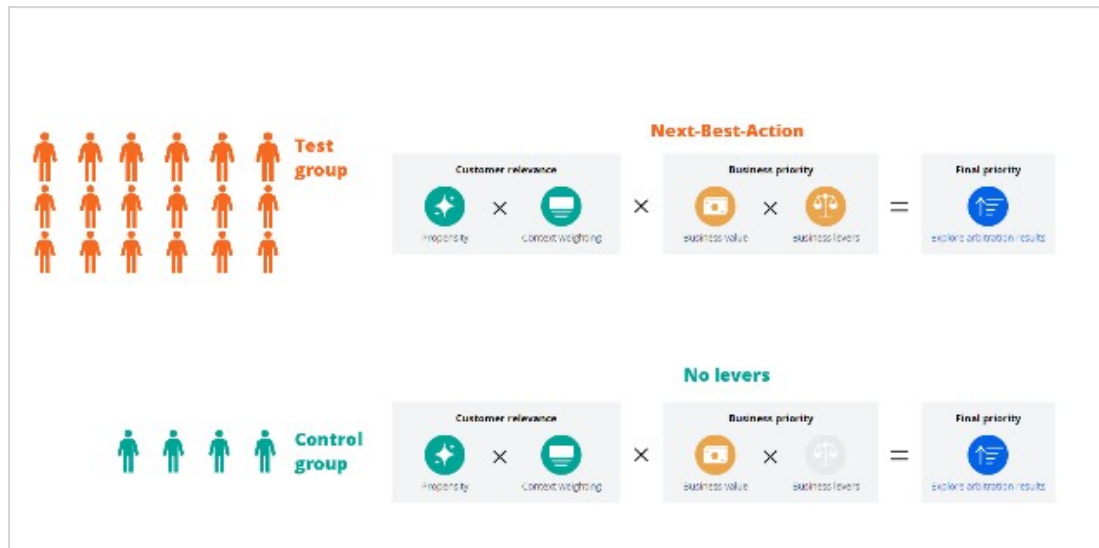
Transcript

Business levers are one of the arbitration factors that allow the business to assert some level of control over the prioritization of actions defined within the system. One of the experiments in Impact Analyzer is the business levers experiment, which highlights opportunities that are missed because of the use of business levers. Using Scenario Planner, you can simulate different business levers settings, and assess which one has the right balance between missed opportunities and alignment with your business goals.

Business 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.

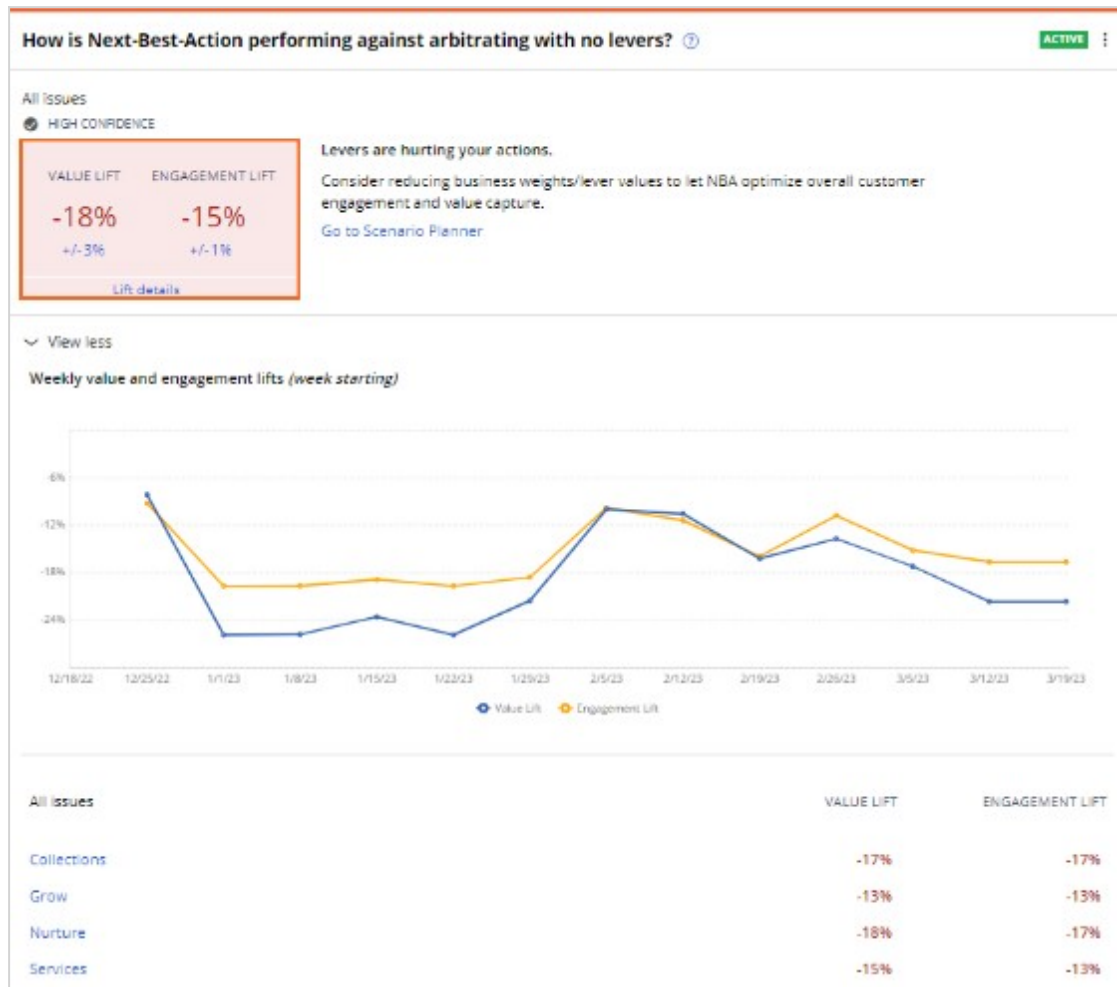
One of the experiments you can perform using Impact Analyzer is "How is next best action performing against arbitrating with no business levers?".

The business levers experiment highlights opportunities that are missed because of the use of business levers. This experiment evaluates the effectiveness of the full PCVL priority formula, which includes Propensity, Context, Business Value, and Business Levers, compared to arbitration with no business levers.



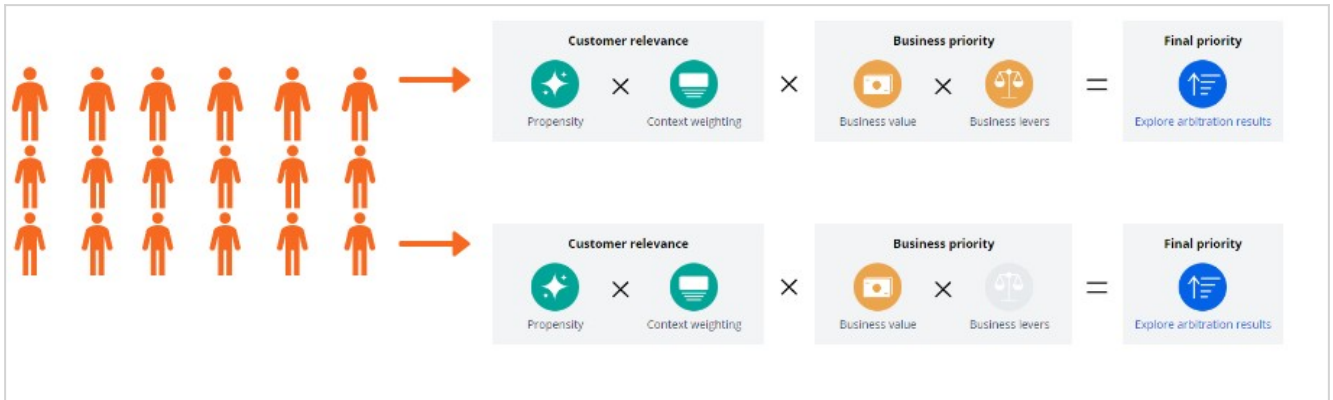
We expect that the next best actions should not outperform the control group with no levers in terms of value capture during this experiment. This is because the action that wins the impression using the full PCVL formula may not have the highest expected value capture. When next best actions arbitrate without any business levers, actions with the highest expected value capture will be presented. However, when business levers are applied, actions with lower expected value capture may be boosted and win the impression. Therefore, for this experiment, the value lift KPI is expected to be negative. This experiment can identify missed opportunities due to the use of business levers. When engagement or value lift is negative in this test, reducing lever values at the issue, group, and action levels can improve performance by giving next best actions the space to optimize. To ensure that the next best action is optimizing lift, the test widget provides recommendations to follow.

In the following example, the experiment indicates an -18 percent value lift and -15 percent engagement lift, with an overall red status, which is in line with expectations.

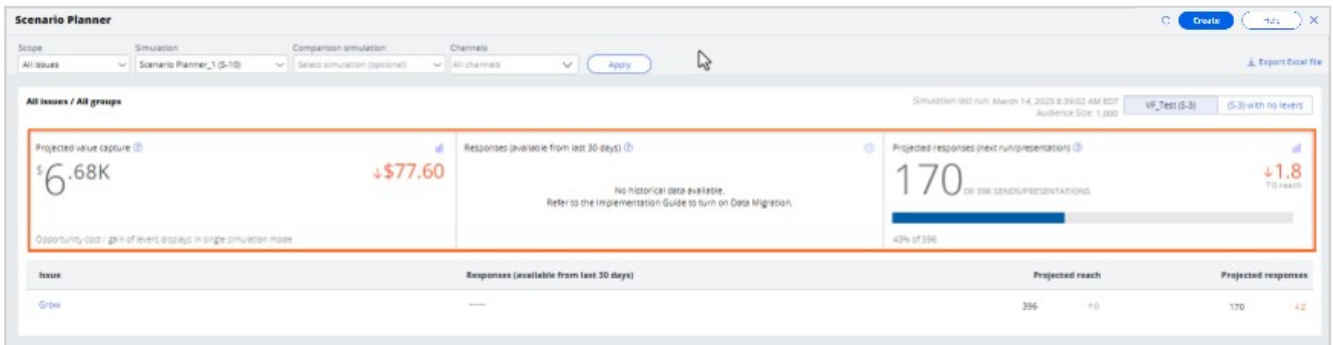


To examine the impact of changing lever values, use Pega Scenario Planner. Scenario Planner allows you to easily simulate 'what-if' scenarios to accurately forecast results, optimize strategies to hit specific goals, and explore the potential trade-offs of each option. Scenario Planner also estimates the value that the subsequent next-best-action run creates using its current configuration. For example, you can observe whether prioritizing a specific action by increasing its business weight will likely result in an opportunity gain or an opportunity cost.

Consider running a comparison simulation using a Scenario Planner to examine the difference between applying the full PCVL formula and the PCV formula without levers. Customer Decision Hub has various subsets of customer data available to run comparison simulations. The subsets of customers represent a sample of real customer data. For a Scenario Planner simulation, you use the same customer data sample for both simulations – one sample with full PCVL, and the comparison sample with the PCV formula.



The Scenario Planner landing page shows a number of useful key performance indicators (KPIs) including projected reach and projected acceptances, projected value capture, as well as historical acceptances, sends, and impressions.



In this example, the value capture is shown as \$6.68k, which represents the estimated value that will be generated by the upcoming next best action using the currently selected configurations. The delta is displayed in red and indicates that actions arbitrated without business levers result in a higher value. Based on the results obtained from the Scenario Planner, and taking into account your business goals, you can determine whether or not to update the business levers.

If you choose to update the business levers settings in an attempt to increase the value lift and engagement lift, you can use Scenario Planner to compare the current simulation with the adjusted simulation. This time, Scenario Planner will compare two simulations with full PCVL formulas, to determine whether the newly adjusted settings are aligned with the business objectives and bring value.

You have reached the end of this video. You have learned:

- How Impact Analyzer identifies the value and engagement loss caused by applied business levers.

- How Scenario Planner enables users to simulate different scenarios and explore potential trade-offs, to optimize their business strategies.
- How updating your business levers influences the Scenario Planner results.

Investigating the effect of applying engagement policies

Impact Analyzer is a tool that uses experimentation to monitor the efficiency and health of next best actions. Through various experiments, it checks whether the next best actions deliver lift and identifies opportunities to better optimize and align next-best-action optimization with your business goals. With the help of Impact Analyzer, you can identify the value and engagement loss caused by excessively restrictive engagement policies. To further analyze such cases, you can use Pega Value Finder to identify underserved customers and take action to improve their experience.

Transcript

Engagement policies are a set of business rules and practices used by the organization to determine which customers are eligible for which next best actions. There is an experiment in Impact Analyzer, which measures the value and engagement loss caused by possibly too strict engagement policies. Pega Customer Decision Hub™ provides an additional optimization tool, Value Finder, which enables users to further explore this issue. The Value Finder helps users identify underserved customers and optimize their next best actions to deliver higher value.

You can use the engagement policies to specify the conditions under which an action or group of actions a customer is eligible. There are three engagement policy conditions: **Eligibility, Applicability, and Suitability**.

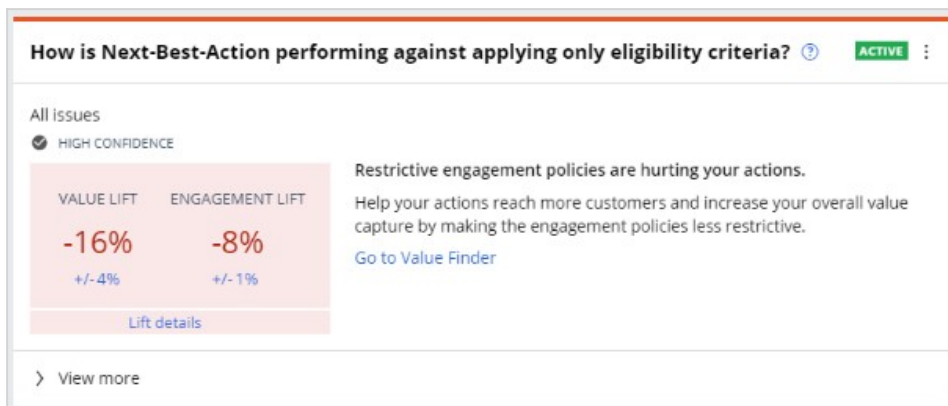
One of the experiments you can perform with Impact Analyzer is "How is Next-Best-Action performing against applying only eligibility criteria?". This experiment compares the next best action configured with full engagement policies and arbitration against the action configured with only Eligibility (without the Applicability and Suitability rules) followed by arbitration. The engagement policies need to be appropriately categorized for the "How is Next-Best-Action performing against applying only eligibility criteria?" experiment to work. Specifically, all the 'required' engagement policies need to be categorized as Eligibility criteria, while discretionary policies need to be categorized as Applicability and Suitability criteria.

You can use this experiment to identify potential opportunity gains by making your engagement policies less restrictive. Sometimes, when engagement policies are too restrictive, actions with a high potential for engagement and value capture are filtered out and do not have a chance to compete for the impression. By eliminating non-essential engagement policies, you can put these offers back in place and increase customer engagement and value capture. In this experiment, the test group receives the fully-

configured next best action, while the control group receives an action with only the eligibility criteria applied.



In this example, Impact Analyzer indicates a -16 percent of value lift and -8 percent of engagement lift, and the overall status of the experiment is negative. The widget displays the recommendation that you can make your engagement policies less restrictive to increase the overall value capture.

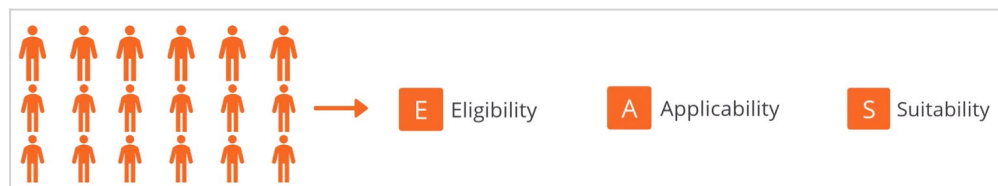


Pega Customer Decision Hub provides opportunities to engage empathetically by identifying "under-served" customers. By using the simulation tool Pega Value Finder, you can identify areas for improvement and monitor scenarios where customers receive no or only low-propensity actions. Value Finder also suggests actions you can take to increase the value capture, such as adjusting engagement policies or creating new actions and treatments.

Consider running a Value Finder simulation to indicate missed opportunities and underserved customers.



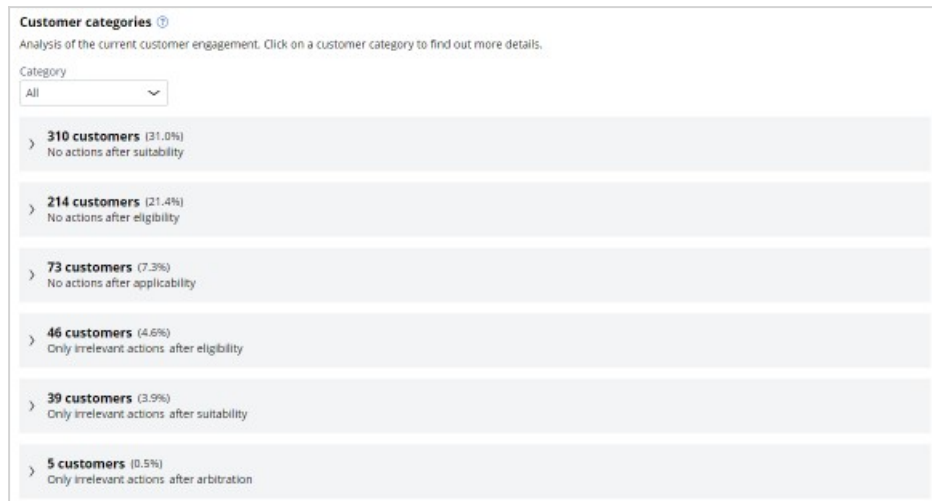
Customer Decision Hub has various subsets of customer data available to run simulations, and the subsets of customers represent a sample of real customer data. For a Value Finder simulation, you use a subset of the customer data and apply all three engagement policy conditions.



Once the simulation run is complete, the Value Finder landing page displays a pie chart with numbers of customers in different categories:

- **Receiving no actions** represents the number of customers who received no actions.
- **Receiving only irrelevant actions** represents the number of customers who received low-propensity actions.
- **Receiving at least 1 relevant action** represents the customers who received high-propensity actions.
- **Receiving only new actions** represents the customers who received only new actions.

Value Finder also displays customer categories tabs, with the number of customers filtered out because of the given engagement policy. In this case, the first customer category shows the number of customers who receive irrelevant actions because of eligibility conditions. In this case, it is 370 customers. Analysis of the first customer category suggests that the eligibility conditions might be too strict and exclude many customers.



When you click a particular category, you can run a simulation to see which conditions influence the actions negatively. Considering the business objectives and current conditions that you want to maintain, you can decide whether to loosen your eligibility rules or not.

If you decide to update the engagement policies to increase lift and engagement values, you can perform an additional Value Finder simulation to determine the number of underserved customers that remain after you apply the new settings.

You have reached the end of this video. You have learned:

- How Impact Analyzer identifies the value and engagement loss caused by engagement policies.
- How Value Finder identifies underserved customers and provides valuable insights.
- How Impact Analyzer and Value Finder help businesses improve the optimization of next best actions and align them more effectively with their overall business goals.