Credit Cards Prospect Affinity
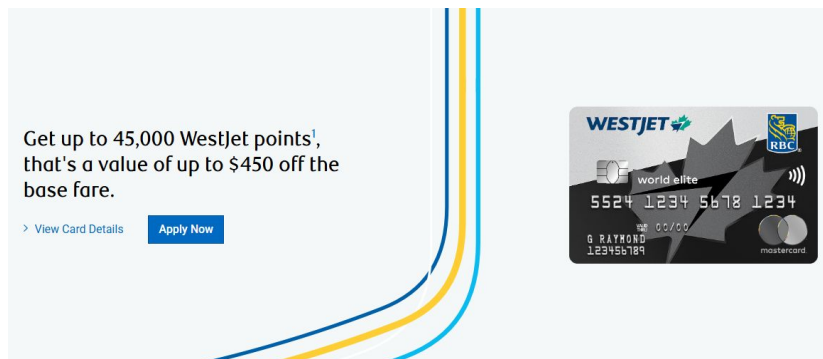
Public Site Personalization

RBC®

Business Context

The RBC public site serves as the front door for potential clients, offering a space for product exploration and an opportunity to make a strong first impression to drive conversion. Therefore, ensuring an exceptional user experience at this stage is crucial.

Personalizing the content on the Credit Cards public site for visitors can significantly enhance the process of driving online credit card applications. In fact, existing RBC clients on the public site already receive personalized credit card recommendations from the NBA Product Recommender Model, which recommends the top 5 credit cards, resulting in a 16% increase in online credit card applications.

Get up to 45,000 WestJet points[1], that's a value of up to $450 off the base fare.

> View Card Details   Apply Now

Building off this success, we aim to expand credit card recommendations to prospects (non-RBC clients).

Currently, all prospects receive the same generic experience regardless of their needs and behavior, but only ~4% of prospect visitors apply for a card, presenting a major opportunity for growth. By integrating a recommendation system for prospects, we can highlight credit card options they are more likely to consider, increase engagement, and drive them further down the funnel.

Drive $1+ million in incremental 5-year NIBT through prospect product recommendations – with a path to scale impact to $3.6+ million

OBJECTIVE	Increase credit card digital sales on the cards site for 3.8 million prospect visitors by improving user engagement and conversion through product recommendations with the Cards Prospect Affinity Model.

STRATEGIC ALIGNMENT	• Optimizes public site channel effectiveness to accelerate new client acquisition growth • Enables data-driven personalized experiences higher up in the funnel to prospects

KEY ACTIVITIES	• Q2: A/B test with the rules-based version of Cards Prospect Affinity on 2 pages on the cards site • Q3: Launch of the model version and upgraded release • Q4 and Beyond: Rollout across the public site pages

IMPACT		5% Uplift		8% Uplift	
		Cards	5-Year NIBT	Cards	5-Year NIBT
	Targeted rollout select cards pages	1,637	$1,070,705	2,619	$1,713,128
	Full rollout across the cards site	3,453	$2,258,077	5,524	$3,612,924

"Model" V0: Prospective Client Customization – March 2025

The ADS team has already developed a V0 solution (rules-based approach) for prospective clients using only postal code information to make inferences about this user's credit card preferences, which is described in the diagram below.

The V0 solution and subsequent enhancements will predict the **top 5 credit cards** that a prospective client would be most interested in applying for in their current digital session.

The V0 experiment was launched in April and represents the first level of customization for prospective clients.

**Step 1.** When a prospective client visits the RBC public site, Google tells us what their **IP address** is

precisely

Step 2. Precisely maps the user's **IP address** to their **postal code**

ENVIRONICS
ANALYTICS

Step 3. Environics maps the user's **postal code** to one of their 67 **lifestyle archetypes** using their proprietary tool called **PRIZM***

Step 4. RBC compares the user's **lifestyle archetype** to a dataset of RBC clients that identifies the most common first acquired card by clients in that given archetype
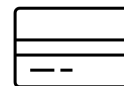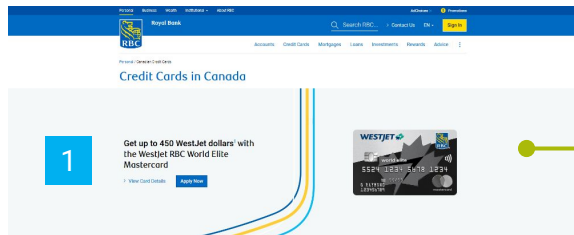
Step 5. RBC shows the user the card that RBC clients in their lifestyle archetype were most likely to purchase

*PRIZM® is a customer segmentation tool that features 67 lifestyle archetype segments which capture current demographics, lifestyles, consumer behaviors, and settlement patterns in neighborhoods across Canada.
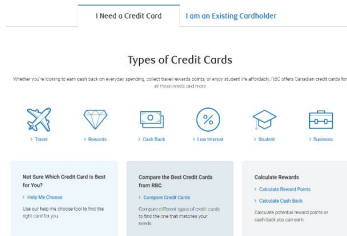
Cards Overview Page – Existing Design

Hero Banner
- Display the number one ranked recommendation.

Product Tiles
- Display the top 3 card recommendations, with additional business rules.

Product Tiles:

Additional business rules will ensure that MC4 / MC2 are shown on the page whenever IAV / GCP are displayed – and vice versa:

- Whenever we show IAV, we will show MC4.
- Whenever we show MC4, we will show IAV.

- Whenever we show GCP, we will show MC2
- Whenever we show MC2, we will show GCP.

All Cards Page – Existing Design
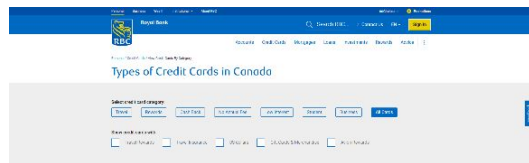
All Cards View / Featured Cards
- The top five recommended products will be shown at the beginning of the product list. The default order will then be applied for the remaining cards.
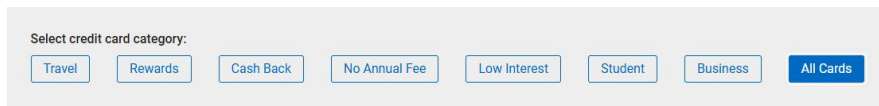
Credit Card Category Filter
- If a credit card category filter is applied, the recommended products belonging to the selected category filter will be shown at the beginning of the product list. The default order is then used to display the remaining cards (excluding the cards that are part of the recommendation)

*Since MC4 / MC2 are displayed on the page when IAV / GCP are presented, additional business rules will not be required.
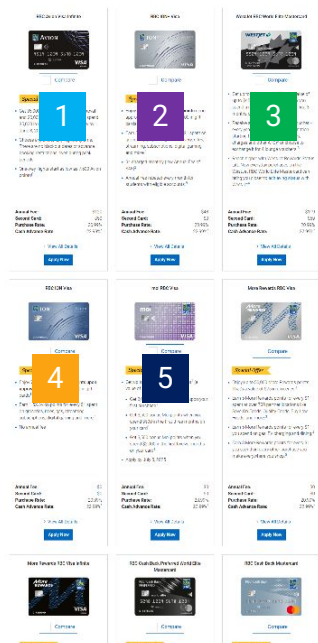
Objective

Increase online card applications for prospects by providing credit card product recommendations on the public site.

Test Setup

1. Default (Control) – existing experience without product recommendations (Westjet [MC4])
2. Cards Affinity – credit cards are recommended based on Cards Affinity V0 with additional business rules to meet contractual obligations
3. Random – credit card recommendations are selected randomly

Key Takeaways

- For this test, recommendations from cards affinity V0 were rules-based that resulted in IAV or MC4 being recommended to ~81% of visitors. This restricted the potential for personalization on the hero banner. It became more of a test between IAV vs MC4 in cards affinity, MC4 banner in the default, and the random card (served 10% of the time)

- The random performing the best out of the all variants provides positive trends to monitor as cards affinity V1 is built, which will provide more differentiated personalized recommendations

- The results are not significant with a p-value of 0.14979. We will continue to run the test and move to V1 as current trends suggest V0 on its own isn't enough to provide a baseline lift

Results from March 18 – April 2, 2025. Source: GA4.

Initial Test Results: V0

P-Value 0.14979	Significant? NO

DEFAULT (Control)
Traffic Weight 45%

Users	App Start Rate	App Submit Rate to Starts	App Submit Rate to Users
27,182	11.45%	36.26%	4.15%

CARDS AFFINITY V0
Traffic Weight 45%

Users	App Start Rate	App Submit Rate to Starts	App Submit Rate to Users
23,289	11.85% **+3.55%**	37.21%	4.41% **+6.27%**

RANDOM
Traffic Weight 10%

Users	App Start Rate	App Submit Rate to Starts	App Submit Rate to Users
4,221	12.46%	36.12%	4.50%

Model V1: Prospective Client Customization – July 2025

Model V1 represents an enhancement from Model V0 in two important ways:

- Using **richer data** to inform prospective client preferences, including user-specific information, RBC client information aggregated at the postal code level which is used to infer details about the prospective client*, and credit card offers

- Using a machine learning model (**XGBoost**) with the features listed above to predict which card a prospective client is most likely to apply for

User-specific Information
- Session details (e.g., device type/brand, language, traffic source)
- Engagement on previous visits to the public site (e.g., user clicked on 'View Details' for ION)

RBC Client Postal Code Lookup
- Demographics (e.g., age, income, lifetime profit value, life stage segment, sex)
- Environics PRIZM lifestyle segment
- Financial profile (e.g., first acquired credit card, credit score)
- User behavior (e.g., yearly credit card transactions on gas, groceries, or travel)

Credit Card Offers
- Dollar value of credit card offers at the time of application

XGBoost

Machine learning model

Credit card recommendation

*We know very little about prospective clients because they are not yet part of the RBC ecosystem. We overcome this data challenge by using a "people like you" approach where we aggregate information about RBC clients in the prospective client's neighborhood and use these aggregated values (i.e., average/proportion) to *infer* details about the prospective client. For example, we use the average income of RBC clients in the prospective client's postal code as a proxy for the prospective client's income.

Model V1: Prospective Client Customization – July 2025

The model was trained on 141,389 prospective clients who applied for a credit card via the public site between August 2024 and June 2025. *Only ~10% of prospective clients were repeat visitors (i.e., had a previous session in the last 30 days)*

Credit Card	Precision	Recall	F1-Score	Support (Actual Counts)	Predicted Counts	Difference
MC4	0.70	0.85	0.77	7,876	9,519	21%
CLO	0.57	0.68	0.62	5,493	6,567	20%
MC1	0.43	0.51	0.47	4,086	4,851	19%
IAV	0.58	0.52	0.55	3,304	2,920	-12%
ION	0.56	0.36	0.44	2,536	1,658	-35%
IOP	0.57	0.29	0.38	1,376	692	-50%
MC2	0.65	0.33	0.44	1,318	679	-48%
MV1	0.65	0.65	0.65	808	810	0%
GCP	0.57	0.23	0.31	651	260	-60%
AVP	0.64	0.25	0.36	288	86	-71%
MCP	0.65	0.19	0.30	293	112	-61%
PLT	0.48	0.26	0.34	107	58	-46%
BAP	0.50	0.33	0.40	58	38	-34%
GUS	0.46	0.23	0.31	57	28	-51%
Accuracy	-	-	0.60	28,278		
Macro Average	0.57	0.41	0.45	28,278		
Weighted Average	0.59	0.60	0.58	28,278		

Top 10 most important features: yearly spend and number of transactions on groceries, gaming, travel, gas & EV charging, dining, USD, and airlines.

Key Takeaways:

- Overall accuracy of 60%

- Weighted (micro) average precision, recall, and F1-score between 0.58 – 0.59 but macro average recall is lower at 0.41 with an F1-score of 0.45

  - Model is doing much better at predicting certain cards (MC4, MV1, CLO) than others

- Difference in performance between classes is driven by class imbalance

  - Large imbalances across classes: almost a third of all applications in our training set are for MC4 while <1% of all applications are for BAP

  - Model is predicting more instances of MC4, CLO, and MC1 since these are the most common cards

  - The model is particularly good at predicting MV1 as it is the only card that is available in Quebec and so has a clear signal (i.e., province) that likely makes it easy to predict

Next Steps and Opportunities

Next Steps:

- Model V2 will leverage a transformer architecture to capture more nuanced temporal user behaviour in previous sessions

  - For users with previous sessions on the site, instead of using 'total number of student account clicks' as a feature for each event, we will capture a sequence of events ['clicked on ION', 'viewed ION details', 'clicked on student accounts'] to gain a clearer understanding of user intention

- Randomization insights - isolating the treatment effect

  - Our training data covers the period when customers were shown Westjet on the hero banner only (default experience). As a result, Westjet is the card that customers apply to most! However, is this because they saw Westjet on the hero banner or would they still have selected Westjet had they not been shown it?

  - With the current data, we cannot distinguish between these two effects: true prospect preferences and the recommendation effect

  - By collecting data where we randomize which of the credit cards a prospect is shown, we can begin to isolate for prospect preferences, allowing us to train a more accurate model in the long-term with randomized data

Opportunities:

- This credit card recommendation system could be incorporated across a variety of digital flows:

  - At the end of the shopping experience when users are opening an account (e.g., "Would you like to add one of the following credit cards with that?")

  - Product suggestions when users are chatting with RBC Assist (e.g., "Here are some credit cards we think would be a good fit.")

- Similar recommendation systems could also be developed for other products such as investments or accounts

Appendix

Credit Card Options

To understand what variables are most important in driving credit card preferences, it is important to understand how the credit cards differ from each other – what specific benefits and offers does each credit card have that would make it attractive to a specific customer?

Rank*	%**	ID	Credit Card Name	Type
1	28%	MC4	WestJet RBC World Elite Mastercard	Travel
2	20%	CLO	RBC Visa Classic Low Rate Option	Low Interest
3	15%	MC1	RBC Cash Back Mastercard	Cash Back, No Annual Fee
4	13%	IAV	RBC Avion Visa Infinite	Travel
5	8%	ION	RBC ION Visa	No Annual Fee, Rewards
6	4%	IOP	RBC ION+ Visa	Rewards
7	4%	MC2	WestJet RBC Mastercard	Travel
8	3%	MV1	moi RBC Visa	No Annual Fee, Rewards
9	3%	GCP	RBC Avion Visa Platinum	Travel
10	1%	AVP	RBC Avion Visa Infinite Privilege	Travel
11	1%	MCP	RBC Cash Back Preferred World Elite Mastercard	Cash Back
12	<1%	PLT	RBC Visa Platinum	No Annual Fee
13	<1%	GUS	RBC U.S. Dollar Visa Gold	Travel
14	<1%	BAP	RBC British Airways Visa Infinite	Travel

*Rank based on 38,484 prospective client applications from Oct – Dec 2024.
**% proportion of all prospective client applications from Oct – Dec 2024.

Credit Card Options: Rank 1-4

WestJet RBC World Elite Mastercard (MC4)
Annual Fee: $119
Type: Travel

- 1.5% and 2% back in WestJet dollars on everyday purchases and WestJet flights/vacation packages, respectively
- Annual World Elite round-trip companion voucher to anywhere WestJet flies (full fare and companion fare at a reduced rate)
- First checked bag is free for primary cardholder on WestJet flights and up to 8 guests on the same reservation

RBC Visa Classic Low Rate Option (CLO)
Annual Fee: $20
Type: Low Interest Rate

- Low, fixed annual interest rate of 12.99% on purchases, cash advances including balance transfers
- Purchase security and extended warranty insurance coverage

RBC Cash Back Mastercard (MC1)
Annual Fee: $0
Type: Cash Back

- Up to 2% and 1% (unlimited) cash back on grocery store purchases and all other qualifying purchases and pre-authorized payments, respectively
- Personalized offers for great brands before you shop to get cash savings or to earn bonus Avion points faster
- Purchase security and extended warranty protection

RBC Avion Visa Infinite (IAV)
Annual Fee: $20
Type: Travel

- Earn 1.25 and 1 Avion points on travel related purchases and eligible purchases, respectively
- Book any airline (choose from 130+ participating airlines), any flight, at any time
- Convert Avion points to other loyalty programs including WestJet Rewards, British Airways, American Airlines, and Cathay Pacific

Credit Card Options: Rank 5-8

RBC ION Visa (ION)
Annual Fee: $0
Type: Rewards

- Earn 1.5X and 1X Avion points for every $1 spent on [groceries, gas, rideshare, streaming] and [all other qualifying purchases], respectively
- Purchase security and extended warranty insurance coverage
- Avion points can be redeemed for gift cards, merchandise, and more

RBC ION+ VISA (IOP)
Annual Fee: $48
Type: Rewards

- Earn 3X and 1X Avion points for every $1 spent on [groceries, gas, rideshare, streaming] and [all other qualifying purchases], respectively
- Purchase security and extended warranty insurance coverage
- Avion points can be redeemed for gift cards, merchandise, and more

WestJet RBC Mastercard (MC2)
Annual Fee: $39
Type: Travel

- 1% and 1.5% back in WestJet dollars for qualifying purchases and WestJet flights/vacation packages, respectively
- Personalized offers for great brands before you shop to get cash savings or to earn bonus Avion points faster
- Purchase security and extended warranty protection

moi RBC Visa (MV1)
Annual Fee: $0
Type: Rewards

- Earn 2 and 1 Moi point(s) for every $1 in purchases in [participating Metro, Brunet and Première Moisson stores in Quebec, and participating Jean Coutu stores, gas and EV charging, dining] and [all other purchases], respectively
- 2 years of mobile device coverage (up to $1,000) when you purchase your mobile device with this card
- Purchase security and extended warranty protection

Credit Card Options: Rank 9-12

RBC Avion Visa Platinum (GCP)
Annual Fee: $120
Type: Travel

- Earn 1 Avion points on all eligible purchases
- Book any airline (choose from 130+ participating airlines), any flight, at any time
- Travel insurance
- Convert Avion points to other travel loyalty programs
- 2 for 1 Friday lift pass at participating resorts (ski hills) across Canada

RBC Avion Visa Infinite Privilege (AVP)
Annual Fee: $399
Type: Travel

- Earn 1.25 Avion points for every $1
- Book any airline, vacation package, hotel, cruise, or tour
- Global airport lounge access, airport security fast track lanes, and dedicated airport parking at select Canadian airports
- 2 for 1 Friday lift pass at participating resorts (ski hills) across Canada

RBC Cash Back Preferred World Elite Mastercard (MCP)
Annual Fee: $99
Type: Cash Back

- 1.5% cash back (unlimited) on all purchases

RBC Visa Platinum (PLT)
Annual Fee: $0
Type: No Annual Fee

- No annual fee
- Insurance coverage for your car rental, travel accident, and purchase security and extended warranty on eligible purchases

Credit Card Options: Rank 13-14

RBC U.S. Dollar Visa Gold (GUS)
Annual Fee: $65USD
Type: Travel

- Pay in USD to avoid daily currency fluctuations
- 1 Avion point for every $1 spent on qualifying purchases; redeem for gift cards, merchandise, travel rewards, and RBC financial rewards vouchers
- Enhanced coverage like travel accident, trip cancellation and interruption, flight delay, car rental coverage, etc.

RBC British Airways Visa Infinite (BAP)
Annual Fee: $165
Type: Travel

- 3, 2, and 1 Avios for every dollar spent on British Airways, dining/food delivery, and all other qualifying purchases, respectively
- Avios points can be used on British Airways and oneworld partner flights (and seat upgrades, hotel stays)
- 10% British Airways flight discounts
- Flight delay and emergency medical insurance

Merchant	MCC	Points	Rewards	Relevant Cards
Westjet	3180	✓	✓	MC2, MC4
British Airways	3005	✓	✓	BAP
Grocery	5411	✓		ION, IOP, MC1, MV1
Travel	Varied	✓	✓	AVP, IAV
Airlines	Varied	✓	✓	AVP, GCP, IAV
Gas & EV Charging	5541, 5542, 5552	✓		ION, IOP, MV1
Rides	4121, 4111	✓		ION, IOP
Streaming, Digital Gaming & Subscriptions Purchases	5815, 5816, 5817, 5818, 4899	✓		ION, IOP
Dining and Food Delivery	5812, 5813, 5814	✓		BAP, IOP, MV1
Metro, Brunet, & Premiere Moisson in Quebec and Jean Coutu	Specific	✓		MV1