



# The Simple, Affordable Way to Apply Predictive Data Science for Extraordinary Results in Retail Marketing

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A technical overview of Loyalty Builders' Predictive Data-as-a-Service

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A simple, automated, affordable, predictive analytics service delivering unique loyalty scores and product recommendations for every customer of retail, e-commerce, CPG, travel, B2B wholesale, and other companies – and used for smarter, personalized direct marketing that measurably lifts revenue.

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## PDS Overview

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Loyalty Builders' Predictive Data-as-a-Service (PDS) is used by marketers at retailers, consumer products and services companies, B2B suppliers, and others to lift revenue from direct marketing campaigns. The PDS delivers scores and metrics that predict when each of their customers will be ready to buy, loyalty, likely spending, lifecycle stage, risk of churn, and what specific products they are most likely to buy next. This information is used to improve targeting of direct marketing campaigns and make individual product recommendations on any marketing channel.

The cloud-based, Predictive Data Service is distinguished by simplicity and effectiveness in boosting revenue and response from marketing campaigns:

- Scores all customers at once, including probability to purchase every product (in time horizons of 7 to 90 days), no matter how many customers or products.
- No platform, application, or database to install or maintain.
- No data integration required. Uses data already available and easily accessible.
- No personal customer information, behavior monitoring, or customer profiling required.
- No data modeling or analytics skills required.
- The Service returns data files formatted for automated execution of campaigns and targeted communications using client's marketing platform. Alternatively, marketers can generate their own campaign lists from the raw scores.
- Supports any direct marketing channel: email campaigns, direct mail, catalog mailings, digital ads, mobile apps, text messages, e-commerce banners and pop-ups, retention warnings and cross-sell leads for CRM systems, etc.
- The best customers for any product, or the best products for any customer are immediately and always available for any marketing campaign or activity.
- Dovetails into campaign schedules and automation technologies already in place.
- Proven highly accurate and effective at increasing revenue from marketing activities and reducing wasteful marketing spend.

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## Using PDS Predictive Metrics

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The metrics and scores provided on each customer by the PDS are used for segmentation and to plan, target, and personalize marketing campaigns. These metrics help answer questions like these:

- Which customers are likely to make a purchase this week, month, quarter?
- Which customers are lapsing and worth investment to save? Which ones are not?
- What are the top N product recommendations for each customer, by probability to buy?
- Which customers are most likely to be interested in a given product promotion?
- Which products should be promoted this period based on strength of customer interest?
- Which customers need larger incentives to get them to buy? Which need none?
- Which customers have the best potential to become loyal, high lifetime value customers?
- Which customers have the highest risk of churning or becoming inactive?
- Who should be extended special benefits or enhanced customer services?
- What is the most profitable list for the next direct mailing or catalog?
- What personalized product offer is most likely to get each customer to buy now?
- Are we overlooking important marketing opportunities?

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## Summary of PDS Process

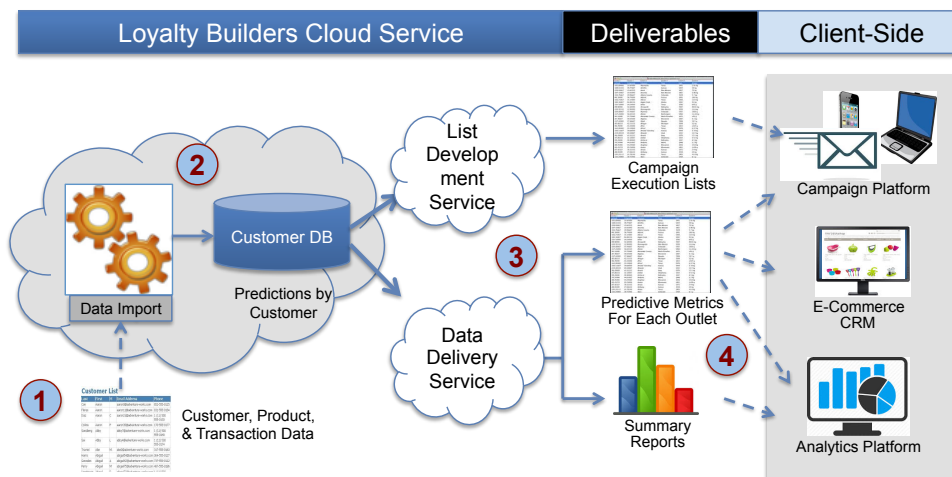
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### 1. Data Input

Loyalty Builders' standard suite of predictions can be derived from a few simple fields of customer transaction history. While additional data can be utilized and tested for model improvement, the core transaction data elements needed to obtain accurate buying predictions are basic:

- Customer ID,
- Transaction Date,
- Transaction Amount, and
- Items Purchased
- Quantity per Item (optional)

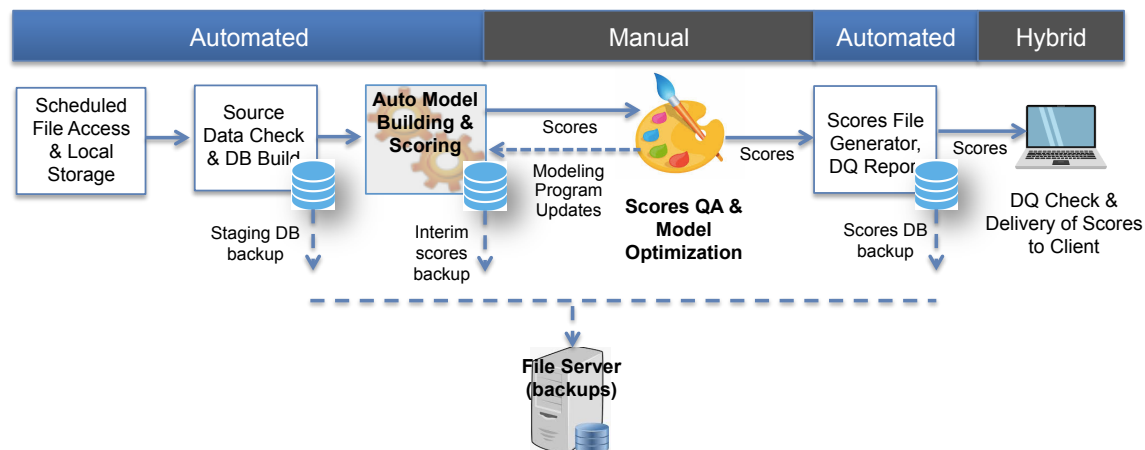
Typically, all transactions over the past 3-5 years will be sufficient for an analysis, depending on frequency of customer purchases. This data is usually easy to extract from an order management system or data warehouse. **No Personal Identifiable Information (PII) is needed.** An item table specifying how products are categorized by marketing will be helpful if products are promoted at a category level, rather than specific SKUs. Delimited text files containing the data are usually uploaded to the cloud service via FTP. The content and format of source data files are agreed between the client and Loyalty Builders during the on-boarding process.



Loyalty Builders PDS Data Flow

### 2. Customer Analysis

The Customer Analysis is a configurable, mostly automated process that generates a range of predictive and statistical metrics (see Data Dictionary at the end of this paper) for every customer in one pass, whether it's scoring thousands or millions of customers. Loyalty Builders' Probabilistic State Learning Machine is a modular ensemble of proprietary algorithms that automatically build new models each time data analyzed. All customers and products are analyzed and scored individually and compared to patterns observed across the entire customer base. The scores may be augmented further by other conventional statistical and learning techniques to increase accuracy. Unlike Big Data analytics that try to discover useful insight from lakes of data, just a few easily accessed data inputs are needed for accurate predictions. Additional customer and product data can be added incrementally, if available, to test for model improvements. This approach dramatically simplifies the process while maintaining accuracy. The resulting scores and metrics are deposited in a database maintained in the cloud by Loyalty Builders for each client, and data extracts from that database may be delivered to clients via SFTP or an API into a client-side system.



Loyalty Builders' Managed Model Building & Scoring Process

Although mostly automated to drive down costs, the model building process is highly configurable and adaptable to specific client needs. Data and database instances are maintained independently for each client, and nothing is shared. The entire process was developed and proven by over twenty years of real-world experience helping retailers, brands, and suppliers of all kinds.

### Refresh Frequency

A refresh of the Customer Analysis can be performed at any interval. Most often, only new transaction data since the last analysis is needed. The recommended refresh interval depends on average customer inter-order frequency. A monthly refresh is common, but weekly and quarterly refresh schedules are possible. Since the predictions are derived from years of history, they tend to be durable, meaning they can be used for targeting campaigns over multiple weeks or months. Unlike the quick response campaigns needed to retarget web activity, PDS predictions can be used plan and target campaigns weeks in advance of execution. In addition, all active customers are scored, so they all can be considered for campaigns, whether or not they've recently engaged with your brand on web, email, social, or for a long time in any way whatsoever.

### 3. Data Output & Delivery

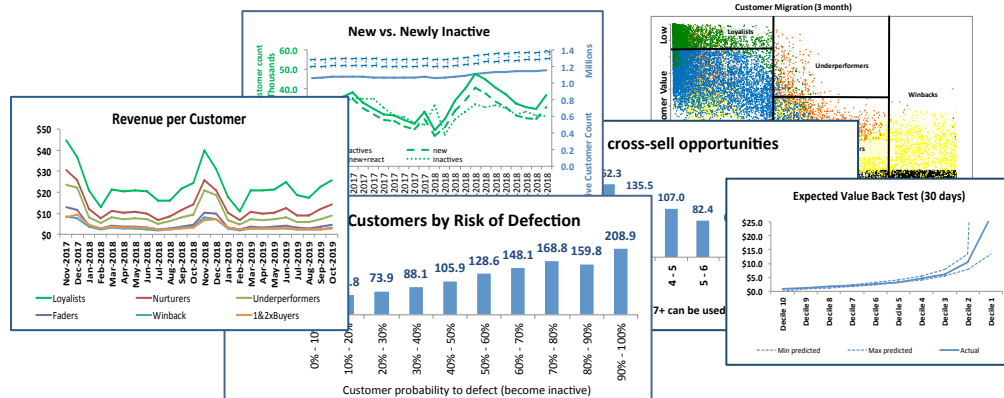
Following the Customer Analysis, the PDS metrics are available in a cloud-based database maintained by Loyalty Builders. Any number of data sets can be extracted and delivered for loading into CDP, CRM, warehouse, or marketing automation platforms. Compilations for further analysis or targeted lists for executing marketing campaigns also can be provided. Loyalty Builders integrates with all popular platforms. Data can be delivered in files for automated upload or via APIs. Campaign lists typically contain customers to be targeted based on criteria selected by clients, and may contain instructions for versioning or personalizing the communication if appropriate, such as with personalized product recommendations. Customers selected for control groups (either holdouts or alternatively targeted customers) can be included for measurement purposes.

There are three ways to access the metrics and obtain lists for marketing campaigns:

1. Lists can be created by the Loyalty Builders' support team and delivered to clients upon request. Files will be formatted as specified by the client for upload to marketing systems.
2. Clients can get a download the raw customer metrics to build lists themselves. This facilitates flexibility and may enable quicker turnaround.
3. Clients may also request custom metrics and data compilations from Loyalty Builders if not part of the Standard PDS Deliverables to meet special or unique requirements.

### ***Deliverables to Client Subscribers:***

- Data files containing a variety of loyalty metrics, plus product re-sell and cross-sell scores and probabilities, by individual customer. See Data Dictionary at the end of this paper.
- Reports with charts and tables summarizing customer metrics and trends.
- Output files formatted to simplify specific marketing purposes (e.g., to execute campaigns, deliver recommendations, support further analysis).



Examples from analysis Summary Report exposing segment profiles, loyalty trends, product opportunities, and more

## **4. Marketing Campaign Execution**

Clients execute marketing campaigns using their existing marketing automation platforms and processes. The PDS data makes these campaigns more effective via better targeting, more relevant product content, and the insights needed for more appropriate messaging. No new platforms, databases, or software is required to be installed or maintained by clients. The predictive data provided by Loyalty Builders is not channel-specific, it's useful on any marketing channel. The PDS provides the predictions (loyalty, spending, product interests, etc.) need to target the most receptive audiences for:

- Catalog and print campaigns
- Dynamic-content email campaigns
- Retention campaigns and journeys
- Personalized social media campaigns
- AdWords and programmatic audiences
- Loyalty intervention campaigns
- Appropriate SMS usage
- Personalized product recommendations
- Variable print campaigns
- Sales call priorities and recommendations
- VIP benefits and enhanced services programs

With over 20 years of retail marketing experience, Loyalty Builders' has developed the tools and best practices to help your team realize its science-driven marketing goals. Contact us for details.

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## Loyalty Builders Data Dictionary of Predictive Metrics

*Predictive scores calculated and provided individually for each and every customer:*

Metric	Values	Explanation	Example Uses
<b>Loyalty Segment*</b>	Loyalist, Nurturer, Underperformer, Fader, Winback, 1&2xBuyer, Inactive	A segmentation of the B2B customer population based on “loyalty,” which is defined as a combination of predicted long-term value potential (Loyalty Score) and Churn Risk Score. See Segment definitions below.	Messaging appropriate to loyalty status. Intervention when loyalty deteriorates.
<b>Loyalty Movement</b>	Loyalist, Nurturer, Underperformer, Fader, Winback, 1&2xBuyer	The Loyalty Segment that the customer belonged to at the time of the previous analysis, compared to the current analysis.	Recent changes in loyalty, particularly to lower loyalty cohorts, can be trigger conditions for markets to intervene and restore loyal purchasing behaviors and prevent further slide before it’s too late.
<b>Loyalty Score</b>	Numeric, unbounded. Typically 0-1000	A proprietary measure of future lifetime value potential of each customer based on timing of purchases, spending trends, items purchased, population patterns, and several other factors.	Loyalty Score is used to target marketing based on each customer’s relative long-term value within the customer base.
<b>Loyalty Rank</b>	0-100	Each customer’s relative loyalty to one another by force-ranking them 0-100 based on the Loyalty Score.	Simplifies targeting to top percentiles, deciles, quintiles, etc. based on expected long-term loyalty.
<b>Churn Risk Score</b>	0% to 100%	The probability, at time of analysis, that the customer will not make another purchase from the time of their last purchase to the end of the “active period.” The Active Period is configurable and represents the length of purchase inactivity required for a customer to be considered churned or inactive. Churn Risk is one of two measures (along with Loyalty Score) used to assign customers to Loyalty Segments.	Risk Score is an early warning of possible churn. It is used to target fading or loyal customers, or customers on the fence. The higher the Churn Risk, usually the more difficult and costly to save the customer. Customers in middle ranges should be addressed to prevent Churn Risk from increasing.
<b>Likely Buyer Score</b>	0% to 100% for a given future time period ranging from next 14 days to next 90 days	The probability that a customer will make a purchase within a specific future time period, the time period being configurable. Unlike Churn Risk, which predicts longer-term risk of not purchasing, Likely Buyer Score predicts probability to buy in the near term for short-term campaign planning and targeting.	Customers with higher Likely Buyer probability are more likely to buy, but may be enticed to spend more or buy a wider assortment of products via cross-sells. Customers with low Likely Buyer probability may need extra incentives to buy.
<b>Expected Value</b>	Currency: \$0 to unlimited, for a given future time period ranging from next 14 days to next 90 days	The customer’s expected spending, weighted by likelihood to buy, within a specific future time period, the time period being configurable. <b>Expected Value (EV) is not expected order value.</b> It is predicted 30-day revenue potential adjusted by the probability to purchase. For example, if the customer buys they might spend \$100, but if they also have a 20% chance of buying, their Expected Value = \$20.	The total or average EV of any group of customers in the next period can be determined. The fact that many in the group will not order is already factored in. This helps determine the type and amount of marketing and sales investment that is justified for a given group of customers. Customers also can be ranked by EV. It usually is best to target customers with highest EV to assure the highest returns from a campaign budget.

<b>Purchase Delay</b>	0 to N	Number of expected purchases missed by a customer, based on the average inter-order pattern between purchases. The delay period is unique to each customer. Example: A PD of 2 indicates 2 expected purchases missed based on prior established pattern.	Used as an early warning to address customers who are starting to fall off prior purchasing patterns.
<b>Previous Loyalty Segment*</b>	Loyalist, Nurturer, Underperformer, Fader, Win Back, 1&2 Buyer	The Loyalty Segment the customer was assigned to in a (configurable) prior period.	Used to monitor recent changes in loyalty and intervene to reverse a negative trend.
<b>Product Re-Sell Probability</b>	0% to 100% for each product or service, for up to 3 future time periods (next 30-, 60-, or 90-days)	The probability that a given customer will again purchase a specific product or in a specific category where they have purchased in the past within a specific future time period, the time period being configurable. Every customer is scored for every previously purchased product or category.	Re-sell probabilities can be ranked to find the top product recommendations for each customer, regardless of any recent engagement activity. Re-sell recommendations can be used to entice higher risk customers to keep purchasing, since re-sell scores tend to be higher than cross-sells. High re-sell scores also can be checked against actuals to see if a highly anticipated product purchase was missed. Product promotions can be planned and targeted by ranking the customers by their scores (whether re-sell or cross-sell) for that product in the campaign period.
<b>Product Cross-Sell Probability</b>	0% to 100% for each product or service, for up to 3 future time periods (next 30-, 60-, or 90-days)	The probability that a given customer will purchase a specific product they have never purchased or within a specific category where they have never purchased within a specific future time period, the time period being configurable. Every customer is scored for every previously purchased product or category.	Cross-sells can be used to increase basket size, order value, and overall assortment of products purchased. They are best used with customers who are already loyal, (low Churn Risk). Re-sell and Cross-Sell scores can be combined (they are both probabilities) for ranking customer interest in any specific product or group of products to be promoted or featured in a campaign.
<b>Overall and Type Rank</b>	Integer	A rank ordering of re-sell and cross-sell probabilities for each customer, both independently and overall (together).	A simple way to identify the top recommendation or top X product recommendations for any customer.

\*Segment descriptions provided below.

### ***Aggregated Historic Statistics:***

Other metrics and statistics about past purchase behavior may be included in the customer scores file provided by Loyalty Builders. Examples include: Recency (days since last purchase), Retention (days since first purchase), number of orders, total lifetime spend, number of products or number of product categories purchased from, etc.

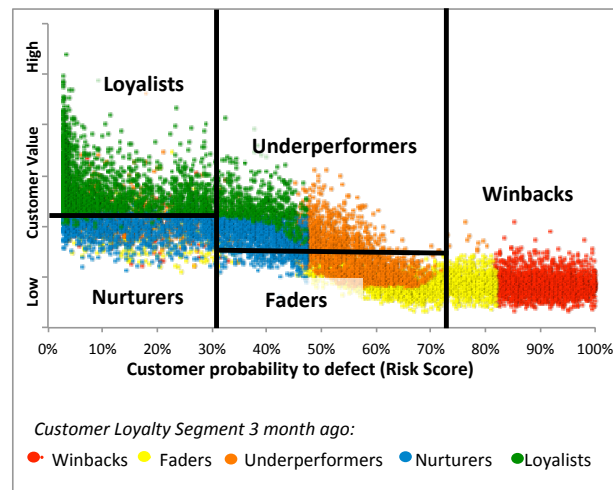


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## \*Loyalty Segments

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A two dimensional segmentation is created for the customer population based on two metrics: Loyalty Score (a measure of long-term future value) and the Churn Risk Score (probability to become inactive or “churn”). Loyalty Segments can also be thought of as “lifecycle stages.” Buyers with between only 1 or 2 purchases are considered new and their loyalty is still uncertain. They are placed in their own Loyalty Segment, but all customers, even 1&2xBuyers are scored for all predictive metrics. When a customer makes a third purchase, they are assigned to one of the main Loyalty Segments. Loyalty Segments can be used to target customers based on loyalty or lifecycle stage.



The diagram above is an illustrative example of how customers may be distributed by long-term value (Loyalty Score) and risk (Churn Risk Score) and moving between the segments. The lines separating the segments are score cut-points that are configurable. Loyalty Builders assists clients in establishing the thresholds between segments that are appropriate for their business. Detailed descriptions of the Loyalty Segments follow:

**Loyalists** – High long-term value, low churn risk customers. These are the best of the best customers who buy most frequently, most broadly, and spend the most. These customers are usually the best targets for cross-sell items to increase order value and overall assortment of products purchased. Many Loyalists will make a purchase whether they are marketed to or not, so large discounts may not be necessary to move these customers. Loyalists contribute a highly disproportionate amount of total revenue, so they should be protected. If they start to falter (move to a lower loyalty cohort), they should be targeted to restore their former strong buying behavior.

**Nurturers** – Mid to low long-term value, low churn risk customers. Nurturers are buying regularly, but they are not as valuable as Loyalists, i.e., not spending as much or as often or on as many items. Nurturers don’t necessarily need to be encouraged to buy more often, but they should be encouraged to spend more, either with high spend incentives or cross-sell recommendations.

**Underperformers** – High long-term value potential, mid-churn risk customers. These often are customers that used to be more valuable, but recently have fallen off pattern, either by buying less per order, or buying less frequently, or both. There are many customers with higher value potential in this segment, and reversing their downward trend is essential to increasing revenue. Since they have potential to spend a lot if they buy, it is best to get them buying, buying anything, but buying more often. Both cross-sell and re-sell recommendations can help, but re-sells tend to have higher probability of a sale. These customers also may need some additional incentives/discounts to buy more frequently.



Faders – Low long-term value potential, mid-churn risk customers. These customers typically do not spend much. They may once have been lower risk (Nurturers) or they never fully established themselves as loyal customers. They make sporadic purchases of low amounts, and they typically buy a narrower assortment than more loyal customers. Other metrics, such as Expected Value, can be used to determine which customers in this group are worth the cost and effort to save and which ones do not justify high investment because they are not likely to be profitable in the long run. Deep discounts may be required to move these customers. Re-sell recommendations are best.

Winbacks – High churn risk customers. These are customers are either already close to churning because they've made no purchases for a long (configurable) time, or their deteriorating purchasing behavior resembles other customers who have gone on to churn. Campaigns to this group should not be expected to perform as well as campaigns to more loyal customers, but they have not yet churned and there is still a chance. Each of them has an Expected Value for the next period and targeting the ones with highest EV will produce a better return for retention efforts/investments. Rich incentives and Re-sell recommendations might entice some of them back.

1&2xBuyers – These are customers that have made between only 1 or 2 purchases, where a purchase is defined as a day when positive revenue was recorded against the customer (if multiple orders were placed on the same day, it's still counted as one purchase). These customers may not yet have a clear loyalty expectation, and should be separately targeted from other customers in re-sell or cross-sell campaigns that welcome them, train them, and encourage further B2B purchases. The Likely Buyer or Expected Value scores for each of the 1&2xBuyers can be used to separate those with highest potential to keep purchasing or spending, thereby justifying more marketing and sales investment.

Inactive Customers – A customer that has not made a purchase in a long (configurable) time, as of date of analysis, and have considered to have “churned.” Inactive customers do not receive predictive scores because they've already churned (their Churn Risk is 100%). They still may be targeted for reactivation, but the cost and effort to reactivate them is likely to be higher than if they had been targeted before Churn Risk got too high.

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