platfora™ Big Data Analytics for
the Fact-Based Enterprise.™

CUSTOMER ANALYTICS

The growth of your business can be measured by a number of different indicators: revenue, profits, market share. But ultimately, your business grows one customer relationship at a time. As you know only too well, such relationships do not appear out of thin air. They require planning, nurturing, and constant attention.

The customer lifecycle is a complex story, one that begins before the customer *is* a customer. If all goes according to plan, a complete stranger becomes a prospect; that prospect becomes a lead; the lead becomes a paying customer; and that customer chooses to stay with you, and to expand the business they are doing with you. Clearly, that process is of fundamental importance to the health of your business. The more thoroughly you understand it, the greater your opportunity for success.

A CHANGING LANDSCAPE

One of the key challenges to understanding that process is the fact that it is evolving rapidly. Even as technology is opening up whole new markets and lines of business, it is fundamentally transforming the entire customer lifecycle — just as it has repeatedly done in the past. Customers and potential customers are enjoying new and unprecedented ways of finding and interacting with your business. They come to you with requirements that are far different from what was standard just a few years ago: expecting choices, levels of service, and time frames that were, until quite recently, unheard of.

Fortunately, that same wave of technological change provides enhanced capabilities both for delivering products and services and for analyzing and understanding the customer relationship. But with these new capabilities come new challenges. In the era of big data, the growth of customer and customer-relevant data has outpaced the ability of conventional business intelligence (BI) systems to stay on top of the rapidly evolving relationship between you and your customers. Some infrastructures can't handle the volume of data; others are ill-prepared for the velocity with which it now must move through the system. Still others are focused primarily on only one variety of data, usually transactional data, and are therefore poorly suited to manage the full set of machine-generated and customer-interaction data which now accompany transactional data — and which frequently overwhelm it.

In this changing landscape, Platfora has emerged as a true alternative to conventional approaches. Platfora provides Big Data Analytics capability directly on any raw

data source you can feed into Hadoop, transcending the limitations of conventional data warehouse infrastructures and BI environments that are optimized only for certain kinds of data. It places intuitive, visual data exploration capability directly into the hands of business users. Platfora also provides powerful capability to segment data and track it over time, bringing the rapidly changing customer relationship into focus for your business.

Let's look deeper into the capabilities that Platfora provides by examining the core Customer Analytics use cases.

MARKETING CHANNEL EFFECTIVENESS

Today businesses rely on a wide variety of channels to produce the leads that will eventually make up their customer base. With the diversity of channels comes a diversity of goals. Social channels are established to provide likes or shares of content or to develop followers of a regular stream of content. A standard web ad campaign might drive traffic to a particular site or encourage user downloads or registrations. Broadcast or print media might direct users to those same landing pages, or to the social channels.

In order to optimize marketing resources, your business needs a consolidated view across all of your marketing channels. If two or more channels are aimed at producing the same outcome, it is vital that you be able to compare the relative cost and effectiveness of each. Moreover, you need to understand which channels are most effective at reaching out to which market segments. It isn't just the *number* of leads that counts; you need to know where the reliable signups, the slow adopters, and the big spenders are all coming from. Platfora provides the tools you need for this analysis, and more.

The first step is to combine datasets from all of the different channels in Hadoop. So, for example, you may need to combine clickstream data from two or three different advertising networks with social media activity logs, along with marketing reach (click, open, share) and online impression data. Platfora supports robust **Event Series Processing (ESP)** capability, meaning that you can join all of these diverse datasets together, using time as a unifying dimension. This provides you with the complete series of events in context.

Using Platfora's Interactive Visual Analysis capability, you can then engage in iterative exploration of the data within Hadoop, enabling you to determine which attributes are driving which business outcomes. So you might, for example, begin to see a correlation between user attributes and campaign attributes. Maybe users within a certain age range are responding particularly well to a specific social channel, or users located in a particular region are responding enthusiastically to a specific set of creatives. Platfora provides you the flexibility to define customer segments based on any possible combination of attributes and behaviors. As you analyze segments against available outcome data — members of this segment tended to visit the site; members of this sub-segment tended to register — a clear picture begins to emerge of where funding and other resources are being used effectively, and where the results are simply not happening. That picture provides a new level of understanding of all your channels, and empowers your business to make the right choices moving forward.

OMNI-CHANNEL PATHWAY OPTIMIZATION

When analyzing the customer lifecycle, understanding outcomes, and in particular how a specific outcome is reached, is critical. The customer lifecycle is defined by a series of such outcomes, all of which are designed to enable a moment of truth, a conversion event, on the part of the customer. As noted above, the process is initiated with one or more such events that effectively qualify a lead, and continues through the conversion of that lead to a paying customer. But it does not end there, not by a long shot. In fact, that is truly the beginning of the customer lifecycle. The long-term value of that customer to your business will be defined by an ongoing series of conversion events, including items such as renewals, cross-sales, and up-sales. These events occur across a vast landscape of interactions and potential interactions. That landscape is dotted by the many potential touchpoints that exist between you and your customers.

The marketing channels discussed above represent a part of that landscape, but only a part. Click-through data from your own server logs record in precise detail how and when the customer is reaching out to you, but in and of themselves these records don't tell why the customer is there or what he or she hopes to achieve. Phone logs and other customer records, including registration information and updates, help to provide a more complete picture. Customer responses to email campaigns, downloads of product information, and participation in online communities also shed some light. And then there are the customer transaction records themselves, each of which

MERCHANT OFFERS

Bank card and credit card providers are constantly looking for ways to convince more merchants to accept their cards for payment. When approaching these merchants, they need to make a strong case as to why their specific card is the right choice for that merchant.

To make that case, they must review and consolidate data from dozens or even hundreds of sources. All of that data must be brought together and analyzed across multiple dimensions, including merchant category, consumer demographics, consumer behavior, types of products and services sold, and so on.

With its powerful time series processing and segmentation capabilities, Platfora makes it easy for card providers to isolate the right combination of customers, transactions, and external factors to develop relevant and customized strategies. Card providers can engage in quick and powerful iterative exploration of the data to develop strategies that demonstrate very specifically how offering their card can benefit those merchants: the kinds of net new customers and transactions they can expect to acquire, along with the advantages of accepting payment via their card versus a competitor's.

describes a prior successful conversion event and provides some insight as to what the customer might do next.

In fact, all of these disparate data sources (and the touchpoints they describe) should be leading, whether directly or indirectly, to a conversion event. A synthesized view of this data begins to reveal the paths that lead from the various touchpoints to the desired conversion outcome. Platfora enables exactly that synthesis, providing for intricate pathway analysis through a combination of the time series processing capability described above and its unique and powerful in-memory processing capability.

Once again, the first step is to combine all of the various touchpoint data sources in Hadoop. But for pathway optimization, the analysis will not occur there. Instead, you transfer the relevant data to the Platfora in-memory acceleration layer. The data you need is materialized from Hadoop into an **Event Series Lens (ESL)**, a structurally optimized view of the data which unites all of the channels on the dimension of time.

The ESL enables time-series analysis of the multi-channel data. You can discover existing pathways through the touchpoints and iteratively model how they lead to the conversion event. You can identify the different segments of customers that take each path and measure those segments on other business metrics, such as the likely lifetime value of the customer to your business. Platfora enables you to visualize the progress through each assumed pathway by building out a sales funnel showing how customers proceed on to the conversion event, or where they stop along the way. Such analysis reveals hidden triggers leading to the conversion event, as well as roadblocks that are preventing it. It also indicates the quickest path to the conversion event (by segment) and reveals which paths are the most and least likely to be followed. Tracking fallout on the funnel provides the opportunity to analyze each pathway iteratively, examining how each segment performs in it. With Platfora, you can define segments according to standard attributes such as demographic data or you can segment according to customer behavior. You can even define one or a series of touchpoints, or a step in the sales funnel, as a customer segment. Platfora provides the ability to do a mashup — to create segments by viewing behavior across all datasets; you can also define behavior sequentially or via time-series.

These options combine to provide unprecedented granularity in understanding how customers arrive at the conversion event. A holistic view of the data provides context that was not previously available; now you can understand how these events interact and unfold over time. Armed with that perspective, you can optimize conversion rates, mitigate sales funnel drop-out, and lower conversion costs by focusing resources on the most effective channels.

PURCHASE AFFINITY ANALYSIS

A critical piece of the process of managing the customer lifecycle is maximizing each customer's value. Each customer transaction presents an opportunity to realize more than just the value associated with that particular transaction. To make effective use of such an opportunity when it arises, there are a few questions for which you must already have answers:

- What else might this customer need?
- What else is this customer likely to buy?
- What additional purchases have others made when making this purchase?

The answers to these questions are spread out over a wide variety of data sources. Customer profile data and previous transaction records reveal some of what you need to know: You can look at what the customer has purchased, and in what order. You can discover what payment type the customer typically uses, and look for patterns that emerge from previous transactions. For example, how often do two purchases occur in the same day or in quick succession?
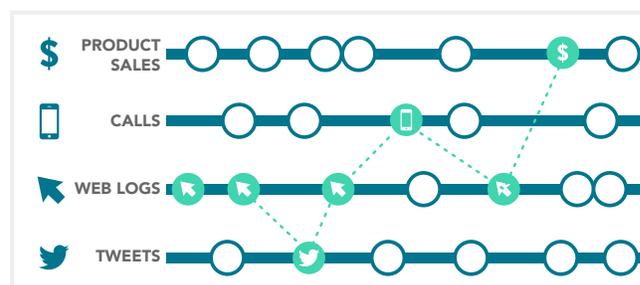
You can monitor the use of coupons and other promotions. Of particular interest is whether the customer has a loyalty card. Research shows that consumers are more likely to go with a product or service that provides loyalty benefits, and that 80% of consumers tend to purchase more from companies whose loyalty program they belong to.[1]

You can examine how often they use their card, and for what. You can even drill into how often they redeem benefits from the loyalty program to determine whether a purchase now might push them "over the top" to some new benefit level.

Another important aspect to explore is which, and how many, channels the customer uses to interact with your business. Research has shown that customers using multiple channels spend 15-30% more than those who use just one, and that customers who use all available channels spend an additional 20% above that.[2]

Multiply all of that customer profile and transactional data by your entire customer base and you have a wealth of purchase affinity data to explore. This vast dataset can then

be enriched and expanded by any number of external factors, including recent campaign data, store layout information, weather data, car and foot traffic data, jobs reports, economic reports, and so on.

The key to analyzing purchase affinity is segmentation, and this is where Platfora comes in. Again, you first bring all of the customer profile, transactional and external data together in Hadoop. To explore purchase affinity, Platfora provides a choice of options in segmenting your customer base. You can use the **Segments** feature to create groups of customers that have performed certain actions: purchased a particular product; expressed interest in a product or product line; followed the same sequence of product purchases, upgrades, and renewals; purchased any two of the same three (or three of the same five) products; etc. Creating such segments and comparing them with each other will make the relationship between different purchase events clearer. For example, you may find that male customers aged 18-34 are twice as likely to purchase product A than any other defined segment.

80% of consumers tend to purchase more from companies whose loyalty program they belong to.

Additionally, you can use **Event Series Processing** to understand customer attributes based on both behavior and external events, in addition to the more traditional attributes. Using this approach, you can identify the likelihood that a specific purchase will take place based on other events: the purchase of other items, the weather, demographics, payment type, use of coupon, etc. So, for example, you may find that customers using a particular discount coupon to purchase A are twice as likely to purchase B in the same transaction as customers without the coupon. Or you may find that sales of C rise dramatically across several segments whenever the temperature falls below freezing. One food distributor tied in-store promotion of its products and cross-promotion of affiliate products to the NCAA "March Madness" college basketball tournament, citing a 60-170% sales lift for participating retailers.[3]

Understanding purchase affinity relationships enables your business to optimize inventory, optimize production, and save costs on logistics. And as outlined above, making affinity relationships explicit can help your business maximize the value of each customer relationship. For example, optimizing customer offers based on established affinity patterns can dramatically reduce the marketing and sales costs associated with certain purchases, and can drive significant increases in revenue. As enabled by Platfora Segments and ESP, purchase affinity analysis can simultaneously increase the likelihood that a customer will buy and decrease the costs associated with making that happen.

CHURN ANALYSIS

As noted, Purchase Affinity Analysis provides vital insight for ensuring maximum value over the customer lifecycle. On this same critical path is Churn Analysis, which maximizes customer value by identifying, and helping to prevent, the risk of loss of valuable customers. One European pay TV company was able to double its profits by implementing a churn prediction model and taking effective action on what the model showed.[4] In fact, research has shown that companies can increase profits by up to 100% by retaining an additional 5% of their customer base.[5] Churn analysis involves identifying both customer behaviors and sequences of events that tend to lead to termination of the customer relationship. In high-turnover settings, this type of analysis can also provide valuable insight into which customers represent a good investment of time and resource going forward versus those that are better replaced by more high-value customers.

The first step is to identify the causes of customer churn. Customers may leave because of a degradation in quality of service, or a perception that service has degraded, which is equally damaging. Depending on the products and services you provide to your customers, a pattern of diminished frequency of use may indicate that customers have that perception. It could also be evidence that your customers are finding more value in a competing product or service and using it instead. Other factors to look for might include a change of device or a change of address — new equipment and new locations can often mean new options for the customer. It is also important to look at such demographic factors as the age and income level of the customer. What other changes are other members of these demographic groups currently making? Finally, you have to take macroeconomic events into consideration, including such factors as the jobless rate and the overall health of the economy.

You might think of Churn Analysis as the mirror or negative image of Omni-Channel Pathway Analysis. As with omni-channel analysis, you begin by consolidating all of the

1. And the best loyalty program goes to... Coles," Madeleine Ross. B&T. May 20, 2013.
2. "The Omnichannel Shopper: Anytime, Anyplace, Anywhere," Carsten Thoma. Retail Online Integration. December 23, 2010.
3. "Tyson Joins in Springtime Food Promo Activity." Retailer Daily. March 23, 2009.
4. "CRM at a Pay-TV Company: Using Analytical Models to Reduce Customer Attrition by Targeted Marketing for Subscription Services," Burez & Van den Poel. Expert Systems with Applications. 2006.
5. "Zero Defections: Quality Comes to Services," Reichheld & Sasser. Harvard Business Review. September 1990.

relevant data and creating an **Event Series Lens** for exploration. Starting with individual churn events, you then begin tracing the sequence back through time, identifying the customer attributes and external factors associated with the event. Platfora makes it easy to perform such analysis iteratively, and to test hypothetical relationships between the various segments, attributes, and churn events.

"Increase profits up to 100% by retaining an additional 5% of the customer base."

Once again Platfora provides the tools to visualize these sequences with interactive funnel diagrams. Now the challenge becomes identifying pathways that don't lead to a particular outcome. By testing different scenarios, you are able to distinguish between factors indicating a slight bias away from churn — for example, as accounts age they tend to drop off more slowly — versus a strong bias away from churn — for example, customers given a credit or other incentive become much more loyal and significantly less likely to leave. Identifying these pathways is a crucial component in ensuring that the customer lifecycle does not end prematurely, and that your business preserves the expected value from your customers.

MARKET BASKET ANALYSIS

Whether your business is online or at the local mall, as a retailer you need to know the relationships between the different items that customers place in their virtual or actual shopping carts. First there is the correspondence within a single transaction. This tells you that a shopper who has already put graham crackers and marshmallows into the basket is very likely to add chocolate bars as well. Such information can play a determining role in how you display each of these items in the store, as well as how you handle placement of promotional materials for each and for the combination of them.
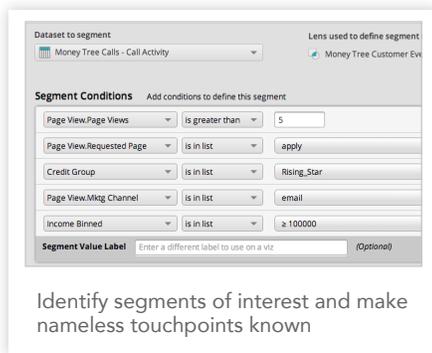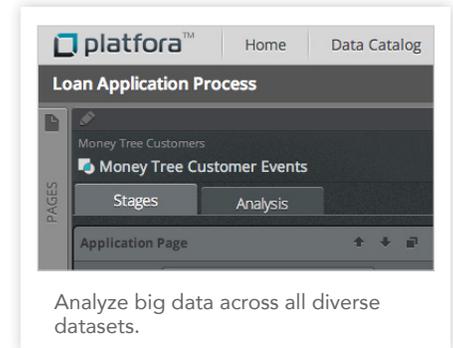
Market basket analysis has uncovered such unlikely pairings as beer and diapers. In the online world, these kinds of relationships are reflected in the helpful "customers also bought" and "you might also enjoy" messages that accompany many transactions.

But providing such messages, or creating clever display options for items within the store, can't help much when the correspondence is not between items in a single transaction, but between transactions over time. Analysis might show, for example, that customers who purchase camping equipment in the spring are likely to buy skiing gear in the fall. Through a combination of its Segmentation and Event Series Processing capability, Platfora enables you to explore market basket relationships to discover hidden relationships and opportunities. You can segment customers by individual products or groups of products. Event Series Processing enables you to break groups of purchase decisions into sequences, rather than just view them as clusters of related products. You can then analyze these products, groupings, or sequences against each other or against external criteria such as geography or time of year. These capabilities enable you to reveal both the immediate and the longer-term relationships hidden within the market basket and maximize the value of each transaction, both for your customers and for your business.

INSIGHT FOR EACH STAGE

Platfora's end-to-end Customer Analytics solution brings insight to each stage of the customer lifecycle. Beginning at the prospecting and qualification stage, you can analyze multiple channels: comparing performance on diverse and complementary goals, revealing which channels are most effective with which segments, and making costs per outcome explicit. From there, Platfora enables analysis of lead or customer conversions across all channels, interactions, and behaviors — enabling you to pinpoint the most (and least) effective touchpoints and to adjust your sales and marketing strategy accordingly. Next you can explore the hidden complex of customer preferences and affinities which enable your business to optimize up-sell and cross-sell opportunities as they arise. Finally, Platfora provides the tools you need to identify and mitigate the risk of customer churn: keeping the customer lifecycle from ending before its time.

EVENT SERIES ANALYTICS enables you to consolidate all relevant events, behaviors, actions, and results into a single timeline — creating a unified narrative out of these disparate data points. Until recently, this kind of synthesis could be achieved, if at all, only by data scientists in companies with large research organizations and a lot of time and money on their hands. Platfora puts these capabilities into the hands of your business users, not programmers or scientists, providing flexible, open-ended exploration and immediate answers to questions about customer behavior.

Analyze big data across all diverse datasets.

Identify segments of interest and make nameless touchpoints known

SEGMENTATION significantly expands the kinds of segments that you can identify and analyze. Reaching beyond the standard demographic and static-attribute-based classifications that are a hallmark of traditional BI, Platfora enables your IT and business users to define segments based on any possible combination of attributes and behaviors. Your business can now focus on your customers, systems, and devices not just as members of static categories but as unique, dynamic entities defined by what they do — and how they change — over time.
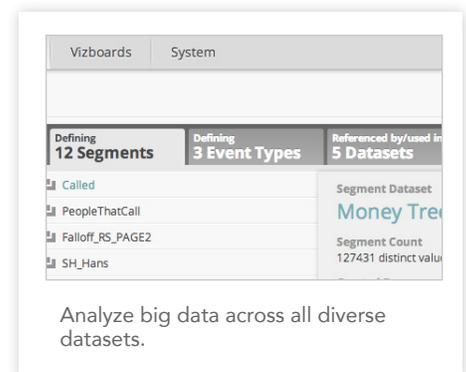
ENTITY-CENTRIC DATA CATALOG enables you to mash up any and all datasets around the entities important for your business. Platfora automatically organizes raw data stored in Hadoop into a structure that your business users can understand, assigning data to such entities as customers or products. Thanks to Platfora's Dynamic Data Lenses, these users can then update the data model and define their own queries and reports quickly and easily, allowing for rapid and flexible analysis of the entities that drive your business.

Analyze big data across all diverse datasets.

PLATFORA POWERING CUSTOMER ANALYTICS

Platfora provides important new analysis capability to support customer analytics.

Platfora puts an end to the gut decision by giving enterprises blazing-fast factual insights across all of their data sets for outsized competitive advantage. Platfora's technology mixes customer interaction, machine and transactional data for infinite correlations across an infinite amount of data so that enterprises can meet and exceed their business goals in the Fact-Based Economy.
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