Buyer Engagement Calculation – for Seller side

Caution: Wide Power cozmo Engagement Calculation is different.

Core concepts.

1. How to Calculate Lead Engagement score with specific seller.

   Use: for lead qualification purpose in CRM.
2. How To Calculate Seller Insights

   Use: in seller dashboard to measure his store performance comparing to another store in same category.

Challenges

1. How to get score normalized in %.
2. Fairly introduce small sellers.
3. How to measure historical and recent engagement
4. In Average Values Calculation, when we shall divide over seller count and when should be over Leads count.
5. Performance of sellers and leads vary according to categories.

Part one: Metric data

In order to measure the level of engagement for any leads and for calculating seller insights we have to track following data:

Seasons Engaged	Total Time Spent	Total Page Views	Average Scroll Depth	Element Clicks	Repeat Page Visits

Definitions of Metric Data

1. Seasons Engaged:

- **Definition:** The number of distinct periods a user interacts with specific seller pages. A period could be hour, a day, a week, a month, or any other relevant timeframe you define.
- **How it's calculated:**
  - Set a timeframe (e.g., a week). This must be adjustable in admin panel.
  - If a user has any activity within a timeframe, they are considered engaged for that season.
  - Count the total number of timeframes a user has been engaged.

2. Total Time Spent:

- **Definition:** The cumulative duration a user spends actively interacting with specific seller pages across all sessions.
- **How it's calculated:**
  - Track the start and end timestamps of each user session.

- Calculate the difference between timestamps for each session.
- Sum up the session durations across all of the user's sessions.

3. Total Page Views:

- **Definition:** The total number of times a user loads or reloads a page on specific Seller pages across all seasons.
- **How it's calculated:**
  - Each successful page load increments the page view counter.

4. Average Scroll Depth:

- **Definition:** The average percentage of a webpage that users scroll through during their visits.
- **How it's calculated:**
  - Track how far down the page a user scrolls (often in pixels).
  - Calculate the percentage of the total page height that represents.
  - Average this percentage across multiple visits and multiple pages views.

5. Element Clicks:

- **Definition:** The number of times users click on specific interactive elements in seller specific pages (**Quote** Request, Wishlist, Product Image Clicks, Product Spec Tap View, Download Catalog Clicks, Social Share Clicks, Seller Review, Seller Rate)
- **How it's calculated:** Implement event tracking on clickable elements to count each click interaction.

6. Repeat Page Visits:

- **Definition:** The number of times a user returns to a specific page on specific seller pages in multiple sessions.
- **How it's calculated:**
  - Utilize user tracking cookies or user IDs to identify when a returning user visits a specific page again.

Note: Most analytics platforms (Google Analytics, etc.) automatically collect many of these metrics.

Part Two: Blueprint of our system Calculate buyer engagement with seller."

Definitions

1. **Average Seller Offering:** Number of product pages specific seller has in specific category

   Calculation: Sum the total product pages for all sellers in the category. Divide this sum by the number of sellers in the category.
2. **Maximum Category Value:**

   Calculation: Store the highest number of each measured metrics (seasons, page views, clicks, time spent) achieved by a single lead interacting with any seller in the category.

3. Average Category Value:

   Calculation: Sum total of each metrics (seasons, page views, clicks, time spent) across all leads interacting with sellers in the category. Divide this sum by the number of leads who interacted with sellers in the category.

4. Seller Size Threshold: threshold factor adjusted from admin panel

   A percentage slightly below the Average Seller Offering that determines if a seller is considered "small."

   Example: If the Average Seller Offering (pages) is 20, a threshold of 16 (80%) might be used.

5. Decay Factor:

   Definition: A number between 0 and 1 used to decrease the weight of older engagement actions.

   Example: A decay factor of 0.9 means each past action is worth 90% of the action that preceded it.

6. Sales Cycle: default value adjusted from admin panel. Give option to each seller to adjust it

   Definition: The typical timeframe from initial lead interest to a closed sale in our business.

   Importance: Helps determine **how far back in history** we want to consider engagement data.

Table: Metric Definitions and Calculation Methods

Metric	Definition	Calculation Method
Seasons Engaged	Count of distinct timeframes with user activity	Set timeframe (day, week, etc.). Count periods with activity.
Total Time Spent	Sum of time spent in all sessions across a time period	Track session start/end, sum durations across sessions
Total Page Views	Count of all page loads/reloads	Increment a counter with each successful page load
Average Scroll Depth	Average percentage of a page scrolled by users	Track scroll position, calculate average % of page height
Element Clicks	Count of clicks on buttons, links, etc.	Implement event tracking on clickable elements
Repeat Page Visits	Count of times a user returns to a specific page	Track with cookies/user IDs, Count visits to the page
Maximum Category Value	Highest value of a metric for a lead within a category	Find the highest recorded value of the metric (time spent, clicks, etc.), per category, and per lead

Table: Max and average values calculation methods

Metric	Max Category Value	Average Category Value
Seasons Engaged	Track seasons engaged per category per lead. Find the highest value.	Average seasons engaged across leads per category.
Total Time Spent	Track total time per category per lead. Find the highest value.	Average total time across leads per category.
Total Page Views	Track page views per category per lead. Find the highest value.	Average page views across leads per category.
Avg Scroll Depth	Track scroll depth per category per lead. Find the highest value.	Average scroll depth across leads per category.
Element Clicks	Track clicks per category per lead. Find the highest value.	Average clicks across leads per category.
Repeat Page Visits	Track repeat visits per category per lead. Find the highest value.	Average repeat visits across leads per category.

Buyer Engagement calculation Steps

1. Calculate seller average products in category.
2. Calculate Category max values.
3. Calculate Category Averages:
   - For each metric (seasons engaged, total time spent, etc.), sum the values across *all* sellers in the category.

- Divide each sum by the number of Leads in the category to get the average value per metric.

4. Define Seller Size Threshold:
   - Set a threshold for each metric that represents a "small" seller. This is often a percentage slightly below the calculated category average (e.g., 80% of the average number of pages).
5. Classify Sellers:
   - For each seller:
     - If their metric value (e.g., number of pages) is below the threshold, classify them as "small."
     - Otherwise, classify them as "large."
6. Lead Engagement Analysis:
   - Determine the seller's size classification (small or large).
   - Calculate raw engagement metrics for the lead with that seller.
7. Normalization:
   - **Small Sellers:** Divide raw metrics by the corresponding category average.
   - **Large Sellers:** Divide raw metrics by the corresponding category maximum.
8. Overall Engagement Calculations
   - Define weight for each metric.
   - Multiply each normalized value with correspondence value.
   - Sum all Values. **Done**

Remember

When calculating average engagement metrics for leads within a category, we always divide by the number of leads, not the number of sellers.

Why

Focus on the Lead: Our goal is to understand how INDIVIDUAL LEADS interact with sellers within a category. Averaging over sellers would obscure this.

Comparing Leads: To see who's most engaged, we need averages based on the same denominator (number of leads), letting us fairly compare one lead to another.

So in conclusion our procedure has the below concepts:

1. **Multi-Category Engagement:** The core of the system is tracking and analysing engagement metrics for each category. We will decide level of categories later.
2. **Dynamic Maximums:** Maximum scores for metrics like time spent, seasons engaged, etc., are calculated periodically based on the most engaged leads within each category.
3. **Minimum baseline:** in case of seller offering is less than average of " number of seller pages" in category, then the normalize value are 80% of average score value of the category. Value can adjusted from admin.

Decay factor

- Overall Lead engagement score= Historical Score + Recent Score
- Historical Score= (Score in time frame) * Decay factor ^ days
- Recent score calculated base in sales cycle

Concept

Instead of having a constant decay factor for each past day, we will use an exponential function. This means the importance of past actions will decrease more quickly as those actions become older.

Key Steps

1. **Choose Base:** Select a number between 0 and 1, representing the daily decay rate of importance. Example: 0.9 means that each past day, an action is worth 90% of what it was worth the day before.
2. **Exponential Calculation:**
    - Let 'd' represent the number of days since an action occurred.
    - Decay Factor = Base^d

Example

- Base: 0.9
- Lead's Actions:
    - 10 page views (5 days ago)
    - 5 page views (3 days ago)
- Calculations:
    - 5 days ago: 10 * 0.9^5 = 5.90
    - 3 days ago: 5 * 0.9^3 = 3.65

Compared to a Constant Decay Factor

With an exponential decay factor, the relative importance of older actions drops much more quickly than with a constant linear decay factor.

Choosing the Right Base adjusted from admin panel and later by seller

- **Faster Decay:** A base closer to 0 (e.g., 0.7) means a steep decline in the importance of older actions.
- **Slower Decay:** A base closer to 1 (e.g., 0.95) leads to a more gradual decrease.

Integration into our Engagement Calculation

We have applied the exponential decay factor before other elements of your calculation:

1. **Calculate Days Elapsed:** For each past action, determine how many days ago it took place.
2. **Apply Exponential Decay:** Calculate the decay factor for each action based on the number of days, using admin chosen base.
3. **Normalize, Weight, and Sum:** Proceed with the rest of engagement score calculation process.

Seller Insights

Concept

Provide sellers with a dashboard or report that compares their store's performance to the overall category averages, highlighting areas of strength and potential improvement.

Data Assumptions

- **Lead Engagement Data:** We are tracking interactions at the seller and lead level, including the metrics we've discussed (page views, time spent, etc.).
- **Category Averages:** We have a process for calculating category-wide averages for each metric, but in seller insight we have to (dividing the sum of a metric across leads by the number of sellers in Category).

Why Divide by Number of Sellers for Seller Insights

The core goal of seller insights is to help individual sellers compare their performance to the overall trend within their category. Dividing by the number of sellers accomplishes this by showing:

- **Typical Scale:** How many leads a seller in this category generally attracts.
- **Typical Engagement Level:** The average engagement a seller in this category can expect per lead.

Metrics for Seller Insights

1. Engagement Metrics
   - Total Leads: The raw count of unique leads who interacted with the sellers in category.
   - Average Page Views per seller:
     - Calculate total page views across all leads in category.
     - Divide by the number of sellers who's in category.
   - Average Time Spent per Lead: Similar approach as above.
   - Average Scroll Depth for seller.
   - Average Element Clicks for seller.
   - Average Repeat Visits for seller
2. Conversion-Related Metrics
   - **Lead-to-Opportunity** [deal] **Conversion Rate:** Percentage of leads who interacted with the sellers that turned into opportunities.
   - **Lead-to-Customer Conversion Rate**: Percentage of leads who interacted with the seller that became customers.

Seller Comparison Dashboard

For each metric, we have to display the following in the seller's dashboard:

- **Seller's Value:** The seller's metric valu.
- **Category Average:** The pre-calculated category average for the same metric.
- **Difference:**
    - Simple subtraction (Seller's Value - Category Average).
    - Express the difference as a percentage increase or decrease for easier interpretation.

Example: Seller Dashboard

Metric	Seller's Value	Category Average	Difference
Total Leads	85	100	-15%
Average Page Views per Lead	12	15	-20%
Average Time Spent per Lead (seconds)	210	180	+16.6%
Lead-to-Opportunity Conversion Rate	15%	10%	+50%

Insights

- **Lower Total Leads:** Suggests a need for visibility or marketing efforts targeted to the right audience.
- **Lower Engagement Metrics (Page Views, Time, etc.):** Indicates potential improvement areas in website design, content, or product appeal within the category.
- **Trend Analysis:** Show how the seller's metrics change over time (week over week, month over month).
- **We will provide some qualitative data points** (e.g., most popular products, most frequent search terms used to find the seller).