

Paper 065-2013

## SAS® Treatments: One to One Marketing with a Customized Treatment Process

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### ABSTRACT

The importance of sending the right message to the right person at the right time has never been more relevant than in today's cluttered marketing environment. SAS® Marketing Automation easily handles segment level messaging with out-of-the-box' functionality. But how do you send the right message and the appropriately valued offers to the right person? And, how can an organization efficiently manage many treatment versions across distinct campaigns?

This paper presents case studies of companies across different industries that send highly personalized communications and offers to their clientele using SAS® Marketing Automation. It describes how treatments are applied at a segment and a one-to-one level. It outlines a simple custom process that streamlines versioning treatments for reuse in multiple campaigns.

### INTRODUCTION

Marketing Clutter. Information Overload. Mass Marketing. Whatever you call it, our customers are taxed more than ever with the overwhelming number of advertisements they are exposed to each day. No matter which medium they come from, whether it is television, the Internet, direct mail, radio, or more, there is a daily flood of ads that might not be relevant to most of the population. So how can Marketers ensure that their message is personalized and is sent to the right person at the right time? How can they foster their customer relationships to ensure higher retention rates and greater loyalty? The answer: Break Through. It sounds simple enough, but even when you leverage advanced analytics to segment your audience and hone your message, it needs to be a repeatable and reliable process to be truly successful. SAS® Marketing Automation and a customized treatment process has helped companies, both large and small, and anywhere in between to achieve this goal.

This paper explains in detail about SAS® Marketing Automation, and how it is used to target an audience. It shows how easy it is to create and report on marketing campaigns by using visual selection and common reporting structure, which can be customized for each implementation. The SAS® Treatment Facility is how SAS® Marketing Automation assigns targeted audiences with distinct messages and offers, and this will be explored in depth. And to take it one step further, adding customizations to Treatments can enhance the functionality and power of the tool.

### CLOSING THE LOOP

Successful marketers measure the effectiveness of their messages by using a holistic approach to the marketing process. This means understanding who is eligible to receive the message; sending the message; knowing when the recipient receives it; capturing when they respond to it; and, sending additional messages, if required, to provoke one or more responder actions. This is called the Closed Loop Marketing Process, which is a complete cycle of marketing activity. Figure 1 below depicts the process, starting with the Marketing Campaign.

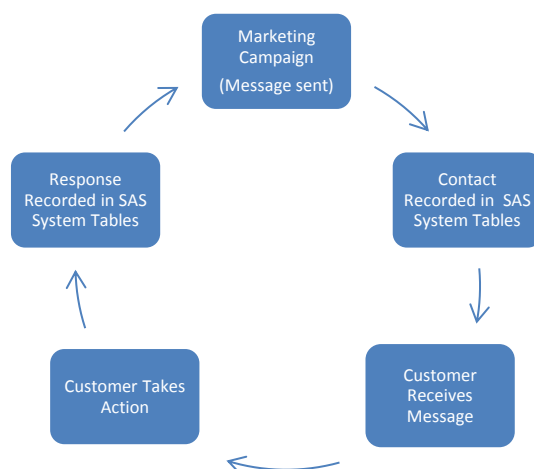


Figure 1. Closed Loop Marketing Process

While all parts of the Closed Loop Marketing Process are important, this paper focuses on the Messaging (Treatments) aspect, and how to use SAS<sup>®</sup> Marketing Automation to send and record marketing communications. In order to understand how to send effective communications and record this activity for later analysis, we first need to learn how SAS<sup>®</sup> Marketing Automation works.

## SAS CUSTOMER INTELLIGENCE STUDIO

Sending a message to a broad group of recipients can be the easiest approach to take when it comes to marketing. After all, casting a wide net might capture the most responders, including those that are not in the target market. However, the effectiveness of that approach must be understood and questions asked before committing to it. For example:

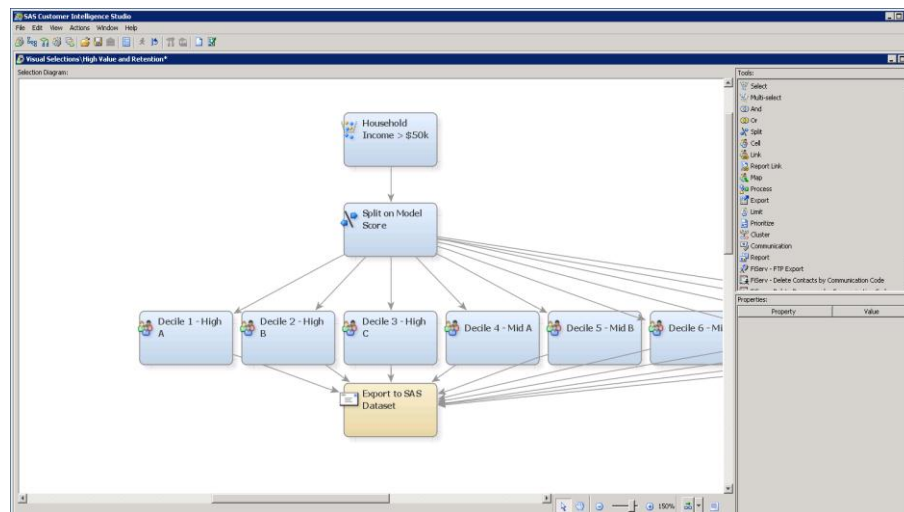
- What is the expected response rate of the campaign? Expected return on investment for the offers?
- Are all communications in line with the organizations contact policy?
- What is the cost of sending the message to the outliers, those that are unlikeliest to respond?
- Will the same offer(s) to both the low and high value customer provoke the high value customer to take action?

To create a more targeted approach to the Marketing process, we need a tool that easily selects a population, applies specific rules to suppress those that do not meet business rules, and segment the population by its value to the organization. This is where SAS<sup>®</sup> Marketing Automation benefits your company.

The key user client in SAS<sup>®</sup> Marketing Automation is SAS<sup>®</sup> Customer Intelligence Studio, a visual selection tool that gives marketers the power to create reusable marketing campaigns. The reusability ensures that business logic is applied in the same consistent manner campaign after campaign. The interface contains “Nodes”, which users select and apply selection, suppression, or manipulation logic. When a campaign is executed, these nodes select and output the best population based on business rules. Let’s take a closer look at how this works.

## EASE OF USE

Campaigns are built using drag and drop functionality from a set of tools provided by SAS<sup>®</sup> Marketing Automation. The types of tools available are Selection, Data Aggregation, Data Manipulation, Data Output, and other customization-type tools. Building a campaign with these nodes is simple. We drag a tool onto the campaign build area and add criteria to the properties of the tool. For example, a Select node (Selection type) can be configured by selecting a data item like Household Income, and adding criteria to it, like \$50,000+. This will select everyone that has a household income of \$50,000 or more. Adding a Split node (Data Manipulation type) splits the audience based on specific criteria, for example by deciles; a Cell Node (Data Output) creates a Marketing Segment; and a Communication node (Data Output type) outputs the resulting population to a SAS dataset, table, text file, or more. We connect all of the nodes by drawing a connection line between each. Building a diagram this way creates a visual workflow of the order in which the campaign will execute. Figure 2 shows an example of a diagram.



Display 1: Example Marketing Automation Campaign

**UNDERLYING DATA**

The data available for SAS® Customer Intelligence Studio is controlled with an Information Map. The Information Map is a logical data layer that sits on top of a company’s data source (typically a data mart), and provides the connection between the source and SAS Customer Intelligence Studio. The Information Map presents complex data in a way that is business friendly, including the use of business-centric names, descriptions, and a folder structure for data item organization. The map is designed to make sense to both users who should not need to know a database table and column name, as well as more advanced users who are familiar with the source data structures. For example, the table below shows a database field name, the more-descriptive Information Map Data Item name, and how it’s displayed in SAS® Customer Intelligence Studio.

Database Field Name	Information Map Data Item Name	How it’s Displayed in SAS® Customer Intelligence Studio
PrmtdLst12Mnth	Contacts Last 12 Months	

**Table 1: Database Field Name versus. Information Map Data Item Name**

Clearly the Business user benefits from this structure, which removes the need to memorize field names of a database table.

**REUSABILITY**

Build it once and reuse it. Change it once, and cascade those changes throughout your campaigns. SAS® Marketing Automation campaigns and logic diagrams are reusable, which saves time and ensures that the same business logic persists between campaigns. For example, a monthly prospecting campaign can reuse last month’s campaign diagram. If needed, it can be updated with the latest business logic. Or, a daily Birthday campaign can be set as a recurring campaign and can execute automatically, off-hours, lights-out.

Not only are campaigns reusable, but campaign components are as well. For instance, all campaigns share export definitions. Users select a pre-defined definition for their campaign, and know that they have an export that has been tested, and more than likely, it has been used successfully for fulfillment. Also, business logic can be shared among campaigns using linked nodes. Pre-defined segments or compliance rules can be built and managed centrally; users will have the most up-to-date logic within their campaigns without needing to apply any updates.

**CUSTOMIZATIONS**

By itself, SAS® Marketing Automation helps users create robust campaigns. Enhancing the campaign environment with customizations to meet unique work-flow and reporting needs adds a new level functionality that lets the tool fit the needs of each customer. This is accomplished with a custom workflow definition and the use of customized entry fields, called User-Defined Fields. A User-Defined Field can be any campaign reference data the business deems important enough to either output on the fulfillment file and/or save to campaign metadata for future reporting use. Each customer can customize the environment by adding User-Defined Fields to capture campaign data components, specific treatment elements, or communication details. Table 2 shows examples of User-Defined Fields, and where each would be used:

Field	Type
Campaign Drop Date	Campaign
Marketing Analyst	Campaign
Program Name	Campaign
Cost Per Piece	Communication
Link to Creative Content	Communication
Expiration Date	Treatment
Offer	Treatment

**Table 2: Example of User-Defined Fields**

Other customizations, like the ability to link to documents stored on a server, import logos onto diagrams, and create titles and headers on diagrams are other areas that make SAS® Marketing Automation a flexible campaign management tool.

### COMMON DATA MODEL/REPORTING

The SAS® Common Data Model is a critical component of SAS® Marketing Automation for closed-loop campaign processing. This operational data store records campaign metadata, contact and response history, and the User-Defined fields as described in Customizations. Leveraging this data provides marketing insight regarding who responded to a campaign (and who did not), the effectiveness of the overall campaign, as well as the effectiveness of individual messages and treatments to each targeted segment. Users can access this information a variety of ways, including SAS® Enterprise Guide and SAS® Web Report Studio.

### SEGMENTS AND TREATMENTS

The end result of a campaign execution is usually communication to a customer. Depending on the goal of the campaign, that communication can range from a simple awareness message to a complex set of offers for a particular product or service. The objective of the campaign analyst is to assign the right message to the right person. It's easy to do this in SAS® Marketing Automation with a combination of segments and treatments.

What are segments? A segment is a distinct part of a larger group. To illustrate, let us consider a simple case with a financial services company, Company A. Company A has analyzed their customer base and determined which customers are bringing higher and lower revenue currently. Company A would like to keep its highest revenue customers and increase the revenue for the lower revenue customers. To do this, Company A is offering cash back rewards to its existing customers if they open a new account. This offer will cost Company A, so they want to be discerning about to whom they extend this offer. Company A has pre-determined that some customers represent a High, Medium, or Low predicted lifetime value based on advanced analytics. The matrix of Current Value (Higher or Lower) by Potential Value (High, Medium, or Low) customers produces six customer segments for the larger audience group of Company A customers.

Current Value	Potential Customer Value		
	Low	Medium	High
Lower	No Treatment	Treatment 1: Thank You Letter Treatment 2: Offer \$	Treatment 1: Thank You Card Treatment 2: Offer \$
Higher	Treatment 1: Thank You Letter Treatment 2: Offer \$	Treatment 1: Thank You Card Treatment 2: Offer \$\$	Treatment 1: Thank You Card Treatment 2: Offer \$\$

**Table 3: Treatment Matrix for Company A**

Segmenting is important in marketing communications because distinct messages, including differently valued treatments can be sent to and tracked for each segment. What is a treatment? A treatment is the lowest reportable message component that comprises a given communication. In our example, Company A wants to present current High Value customers with medium to high potential future value with a message that underscores their importance

to the organization with a high cost packaging and presentation. The lowest potential value customers in this high current value group might receive a lower cost presentation with the same message. The Low Value customers with High Potential Value might receive something that is lower cost to the organization, but has a lucrative offer to entice this segment to move them up to the next group. The Low current value customers with the lowest potential value might not receive any communication at all.

A single communication can consist of multiple messages and/or treatments. In our Company A example, the thank you letter, thank you card, offer \$ and offer \$\$ are individual treatments that can be applied in the appropriate combinations. The highest current value customers with the highest potential value customer segment receives, for example, the thank you note and Offer \$\$ treatments.

## SAS® TREATMENT FACILITY

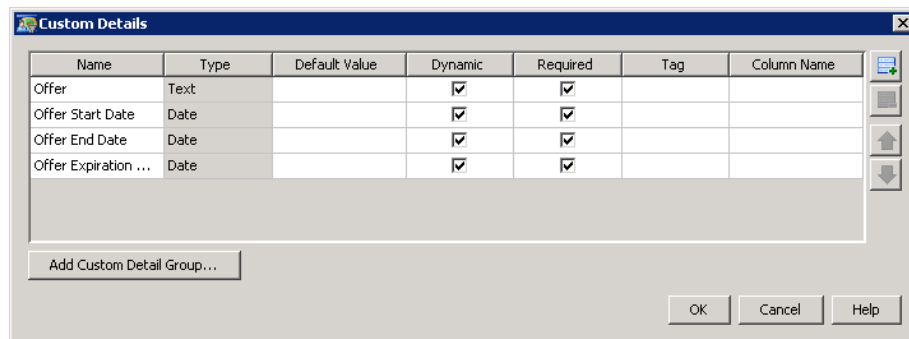
The SAS® Treatment Facility allows users to create and manage detailed Treatments that one or more campaigns can leverage. Like many SAS® Customer Intelligence Studio components, Treatments are designed to be reused and shared across campaigns. Users customize Treatments by creating Treatment definitions that match their operational or reporting needs. *What does that mean?* For any attribute that a company wants to track or report about its messages, a corresponding field can be created in the SAS® Treatment Facility where the user can enter the appropriate information. *Why would we do this?* There are two reasons why that data should be entered in a treatment: 1.) the campaign needs it for output for operational processing; 2.) the entered information will be available for reporting.

## STATIC VS. DYNAMIC TREATMENT ATTRIBUTES

One of the benefits of creating treatments centrally and reusing them across many campaigns and segments is the ability to track an offer's performance over time, across segments and campaigns. What if most of the treatment *attributes* are the same over time, but some *details* are different each time the treatment is applied? For instance, a relevant set of treatment attributes could be Offer, Start Date, End Date, Expiration Date. These are data points that would be included on an output file.

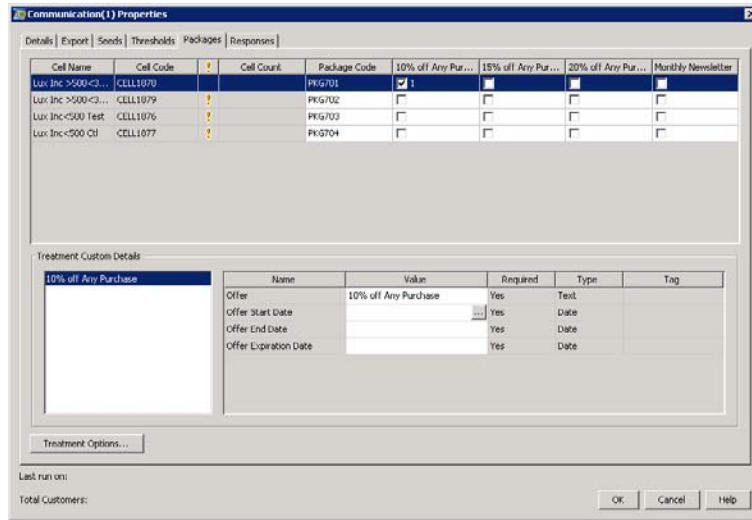
For example, a specific \$5 off coupon has the same dollar value and offer conditions every time it is used in a communication. However, the offer expiration date will change each time. In our current examples, each new offer expiration date would require a new treatment, quickly expanding the number of treatments in the SAS® Treatment Facility and presenting new challenges for reporting on the 'same' treatment over time.

The SAS® Treatment Facility allows users to create dynamic treatment attributes to manage these types of treatments.



**Display 2: Treatment Custom Attributes set as Dynamic**

Once elements of a treatment have been defined as dynamic, users can modify these elements within their campaigns.



Display 3: Treatments Applied to Segments

## USE CASE #1: MANAGING TREATMENTS IN SAS® CUSTOMER INTELLIGENCE STUDIO: APPLYING LOW TO HIGH OFFERS

This use case describes a business-to-customer (B-to-C) SAS® Marketing Automation client that sends personalized communications and offers to a broad set of segments. The highest valued customers receive a premium offer, like a free weekend stay; the offers decline in value proportionally to each segment, down to the lower valued customers, who received a basic message. The campaigns run on a weekly basis, with potentially minor changes between each execution.

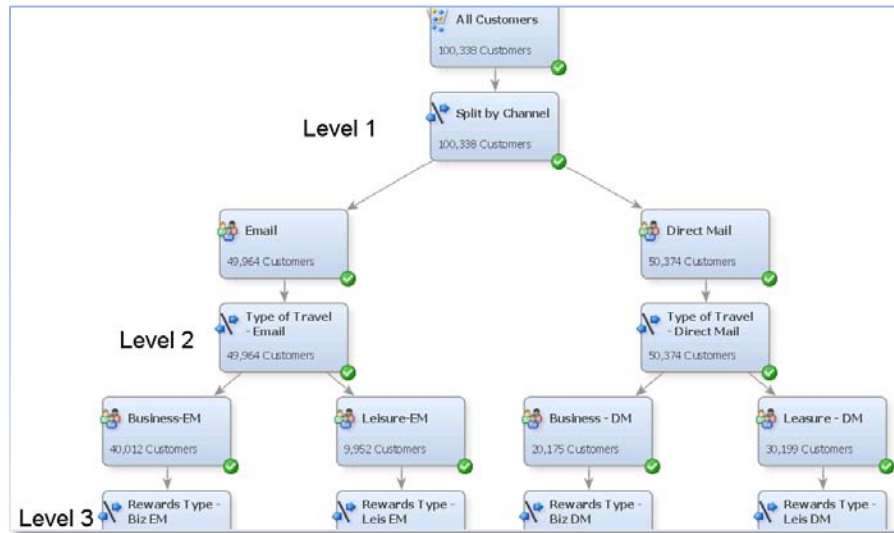
SAS® Marketing Automation makes it easy to fulfill this need, using segmentation and the SAS® Treatment Facility. Understanding the segmenting involved with the campaigns is a critical first step. In this example, it was more than choosing a model score and creating multiple cell nodes from it. There were seven criteria that needed to be applied, and each set of criteria would create additional, more granular segments. The result was hundreds of segments, each receiving its own offer. Let us take a closer look at how this client's needs were met.

### SEGMENTATION

The segmentation in this use case consisted of applying logic to a set of marketable customers, which creates distinct segments to which personalized messages and offers were attached. In SAS® Marketing Automation, this can be accomplished through the use of Select and Split nodes, drilling deeper until the desired level of granularity is reached. An example of the levels of segmenting are:

- Level 1: Channel Preference
- Level 2: Type of Traveler (Business/Leisure)
- Level 3: Level of Rewards (Platinum/Gold/Silver/Bronze/None)
- Level 4: Region
- Level 5: Nights Stayed Last Year
- Level 6: Average Monthly Worth
- Level 7: Test versus Control

Adding these levels to a campaign is easy, as shown in the next diagram. In this example, each level is added to the diagram, following along with the levels outlined above. The segments are now clearly defined in SAS® Marketing Automation. What's important to note is the number of clearly-defined segments created. The B-to-C SAS® Marketing Automation client had dozens of these segments, which allowed them to easily associate distinct offers to each.



Display 4: SAS® Marketing Automation Diagram with Three Levels of Segments

## TEST AND CONTROLS

Once Level six had been added, we next added in test and control groups. Holding out a small percentage of the population allows the client to measure the effectiveness of the message being sent, once responses have been captured. While creating test and control groups could have been done at a point earlier in the campaign, the goal is to measure how well each *message* performs; therefore test and control groups can only be applied after all segmenting is complete. In the case of the B-to-C client, some of the highest valued segments had a very small number of customers (approximately 10). However, a control group was still created to test the message.

**Split(5) Properties**

Name: EM Biz Plat NE A A |

Description:

Split using: percentages [v]    Quartiles    Deciles

Sort by: none (random)    Sort...

Output cells:

Priority	Cell Name	Cell Code	Requested Count	Requested %	Actual Count	Actual %
1	EM Biz Plat NE A A Test	CELL1876		95		
2	EM Biz Plat NE A A Ctl	CELL1877		5		
Total				100		

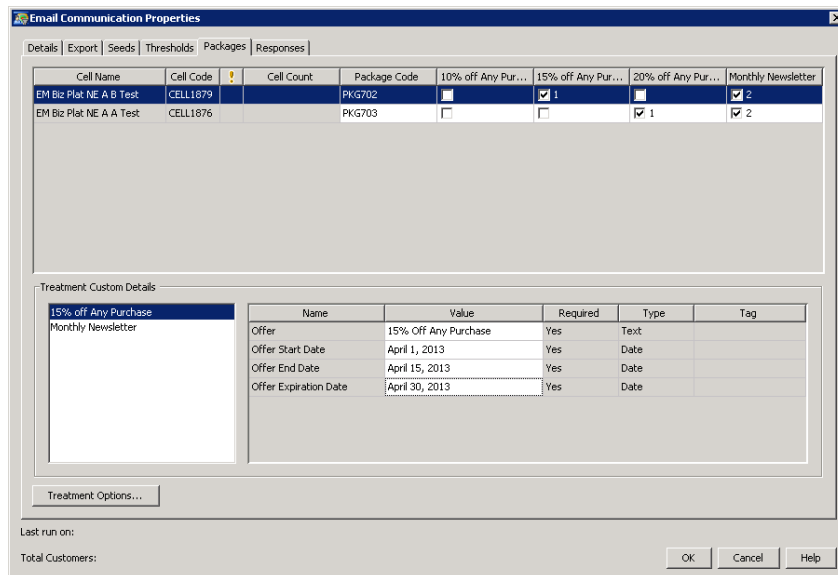
Make output cells available for linking

Update Counts    Last run on:    OK    Cancel    Help

Display 5: Using a Split Node to Create Test and Control Groups

## TREATMENTS

With test and control segments created, the next step was to link Treatments to each Test segment. (Note that Control segments are exported to a different Communication node.) One important rule to consider is that each segment is eligible to receive multiple treatments in a single mailing. To apply each Treatment, a Communication node is used, which contains a section to apply Treatments to each segment.



**Display 6: Associating Treatments to Segments**

In the Communication node shown in Figure 7, note the column heading titled 'Cell Name'. This is the name of the Cell node that is attached to the Communication node. The name of each cell easily identifies each segment, making it easy to connect it to a treatment. Note that each segment receives a different offer, ranging from more exclusive offers for High Value customers, to an enticement for a Lower Value customer.

## RECORDING TO THE SAS® COMMON DATA MODEL

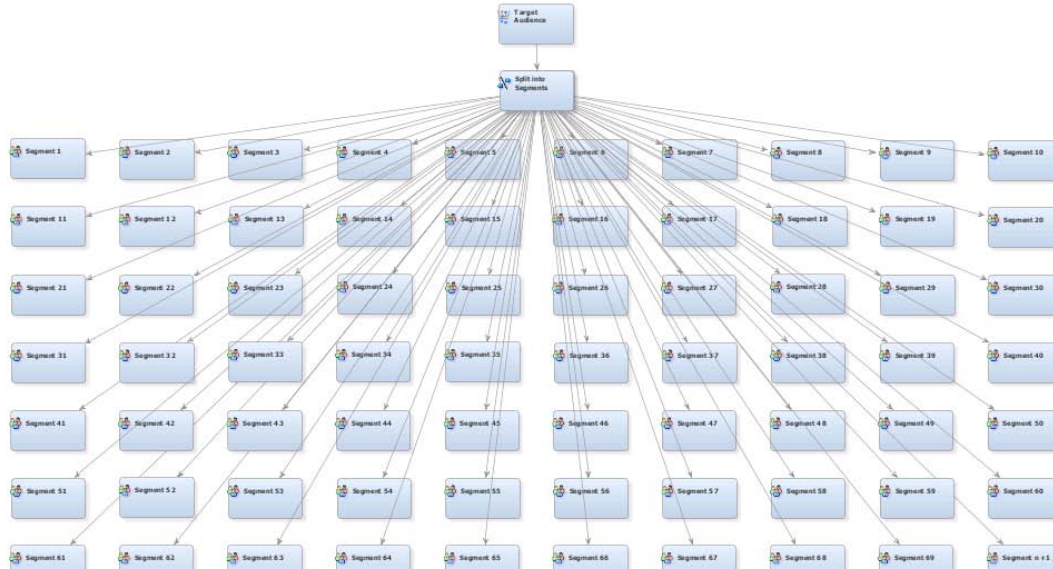
When a campaign is executed, the fulfillment file is created with all appropriate Treatment information appended to it. This data file is then sent to a vendor, where fulfillment occurs. All campaign and treatment-related information, which is produced at run time, is stored in the SAS® Common Data Model. This is useful data for campaign reporting and analysis. The SAS® Common Data Model structure allows for easy reporting of any aspect of a campaign. Using a combination of Treatment data, Contact History, and Responses, the effectiveness of a campaign message can easily be measured.

The campaigns built for the client were a success, and the client continues to use them today.

## ACHIEVING ONE-TO-ONE MARKETING WITH SAS TREATMENTS

We have explored a number of ways to make the management of a large number of personalized treatments feasible. What about situations where assigning individual values is impractical, if not impossible, manually – even with a tool like SAS® Customer Intelligence Studio? For example, assigning an offer for a companion product, specific to an individual's purchase? Or extending an offer like 'spend x/save x' where the amount x is tied to an individual customer's level of recent spend? SAS offers the capabilities to create dynamic treatments, but there is no out-of-the-box functionality to dynamically calculate the individual level of each offer. As your target audience grows, calculating and presenting offers to a segment of 1 becomes unmanageable within a standard SAS® Customer Intelligence Studio campaign with individual treatments assigned to the discrete customer value segments.





Display 7: Micro-Segmentation Challenge

**PERSONALIZING TREATMENTS WITH SAS®**

Assigning personalized treatment values with custom SAS® Marketing Automation processes makes this type of one-to-one marketing possible. Two different approaches to this marketing challenge are discussed in this section. The first case uses standard SAS® Customer Intelligence Studio functionality to assign treatments with standard export capabilities to produce an accompanying data set for the individual factors required to support integration with downstream systems and analysis requirements. The second uses a highly customized SAS process to achieve similar business objectives. The approaches discussed vary in their level of complexity depending on the reporting and integration requirements of the custom implementation.

**USE CASE #2: CUSTOMIZING TREATMENTS WITH SUPPORTING EXPORTS**

In this case, an online retailer using SAS® Marketing Automation had the need to calculate personalized offer conditions as part of a planned promotion. They were able to use standard, out of the box SAS® Customer Intelligence Studio functionality to produce individual treatment output.

**THE MARKETING CHALLENGE**

The online retailer was planning an e-mail communication as part of their promotional strategy. In this communication, some customers were to receive a 10, 20, or 30% discount on their next order based on their value segment. Another group of customers with high predicted value, but no recent purchases, will receive a 50% discount for an order of a certain limit, with the limit based on their 6-month spending history.

Purchase Recency	Customer Value Segment (Based on Total Spend 6 months)			
	Low	Medium	High	Highest
Purchases Last 60 days	No Treatment	Treatment: 10% Off	Treatment: 20% Off	Treatment: 20% Off
No Purchases Last 60 Days	Treatment: 10% Off	Treatment: 20% Off	Treatment: 30% Off	Treatment: 50% Off

Table 4: Treatment Matrix for Online Retailer

Assuming that the data to support this segmentation is available in the underlying database, both the segmentation and treatment requirement could easily be accommodated with SAS<sup>®</sup> Marketing Automation.

Users would create offers of 10, 20, 30 and 50%.

Name	Code ▲	Description
10% Off Purchase	10OFF	10% discount on entire purchase
20% Off Purchase	20OFF	20% discount on entire purchase
30% Off Purchase	30OFF	30% discount on entire purchase
50% Off Purchase	50OFF	50% discount on entire purchase up to specified limit when spending threshold met.

Display 8: SAS<sup>®</sup> Customer Intelligence Studio Treatment Facility

## OPERATIONALIZING THE OFFER

While this meets the basic business requirement, the challenge becomes more difficult when we consider reporting and fulfillment. How will the marketer communicate the actual value of that offer or spending threshold to the e-mail provider and the redemption system? How will the analyst record later the actual value of the discount and calculate ROI. How will the retailer assign one-to-one redemption codes for the high value offer to prevent pass-along?

First, the marketer needed to define a new data item for the spending threshold to include in the export to the redemption system and e-mail provider. A SAS format based on the 6-month spending total was created and added as a new data item in the Information Map to make the information available to the various exports destined for each external system. The unique promotion code for the high value offers used last package\_cd concatenated with the most recent transaction ID for the customer.

Export Definition	Output	Output Path	Output Name	Append or Replace
Email Export Definition	Delimited	C:\CI\Common\Data\CIE\export	MonthlyPromo_8sysdate	replace

Field	Output Name	Format	
Individual ID - Customer	INDIVID		Numeric
First Name - Customer	FIRSTNAME	\$45.	String
State - Household	STATE	\$45.	String
Sales Last 6 Months - Key Attri...	REVENUELST6MNTH	PROMOLMT.	Numeric
Name - Marketing Cell	CELL_NAME		String
Code - Package	PKG_CD		String
Last Transaction ID - Custome...	LAST_TRANS_ID	F11.0	Numeric

Display 9: Using SAS<sup>®</sup> Custom Formats for Treatment Personalization

The use of a standardized cell naming convention will communicate to the e-mail provider the type of e-mail content to display to the customer. It also allows the marketer to report which members of the target audience received the 10, 20, 30 or 50% off offer in standard campaign reporting.

To capture a snapshot of the customer values at the time of communication, including the individual 6-month spending limit and calculated spending threshold, a new export was created. This export contained one record per customer and was generated along with the 'standard' exports at the time of campaign execution. For this customer, a SAS data set was the desired option, but the SAS® Customer Intelligence Studio supports exports of many times, including tables within your DBMS. A pre-defined customer snapshot export, executed for all campaigns, can write output directly to a defined table within your environment to enrich the campaign reporting and analysis possible with other campaign reference data found within the SAS® Common Data Model.

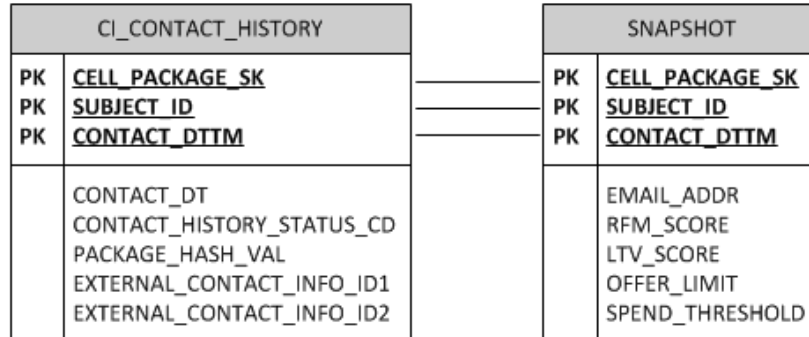


Figure 2: Using Custom Snapshots for Analyzing Personalized Treatments

**USE CASE #3: USING SAS® CUSTOM PROCESSES FOR PERSONALIZED TREATMENTS**

In this case, a business-to-business (B-to-B) customer using SAS® Marketing Automation was faced with the same business challenge: the need to calculate personalized offer conditions as part of a planned promotion. This customer had an additional challenge related to offer integration with a fulfillment system, which required a unique promotion identifier for each promotion level. This customer needed a completely custom process to support their operational needs.

**THE MARKETING CHALLENGE**

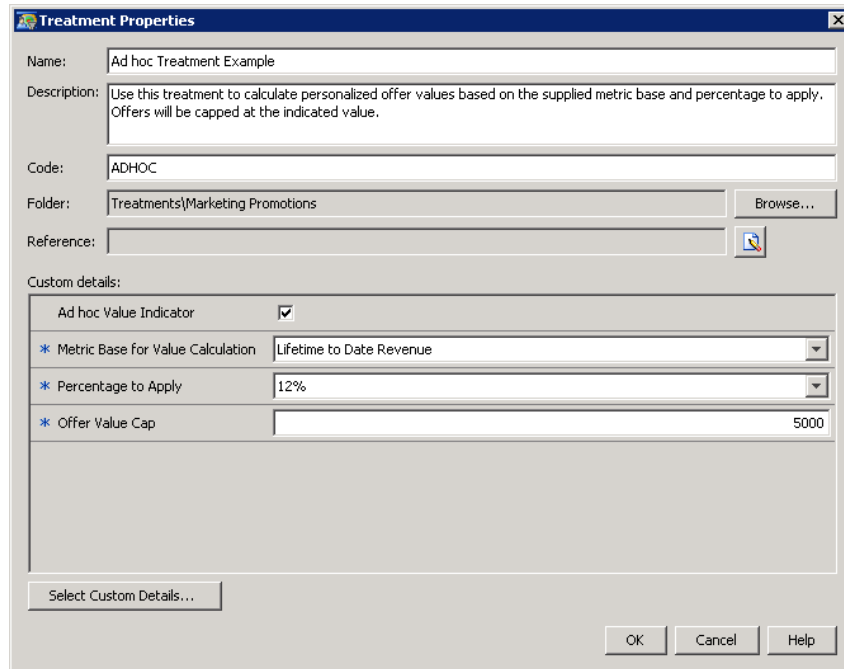
The B-to-B marketer’s promotion was targeting customers with both a wide range of products (basic office supplies to office systems) and an even wider range for customer spend. Business customers with the highest frequency and value of spend are assigned a dedicated account representative who manages the quote, order, and delivery process. Generating and storing the unique promotion code for the fulfillment channel plus later response reporting was critical to the success of this effort.

For the lowest value and items, this B-to-B marketer presents standard offers like free shipping, free gifts, and discounts in their direct mail and online catalogs. These types of offers work well for this audience segment and, like the examples we have seen, are easily managed by SAS® Customer Intelligence Studio out-of-the-box treatment facility. While these types of offers are not appropriate for items of a certain value, promotions, discounts, and other treatments are still important to the managed accounts. Campaign managers needed the flexibility to communicate custom discounts levels for these accounts based on value metrics and campaign budgets.

Customer Account Type	Account Value		
	Low	Medium	High
Not Managed	No Treatment	Treatment: Free Shipping	Treatment: Free Gift
Managed			Custom Discount

Table 5: Treatment Matrix for B-2-B Retailer

A SAS treatment was designed with custom user-defined fields to capture the inputs required for final calculation of the authorized discount for a next purchase during campaign execution. The custom process will look for treatments where the `adhoc_value_ind = 1` and use the user provided values to calculate the personalized offer.

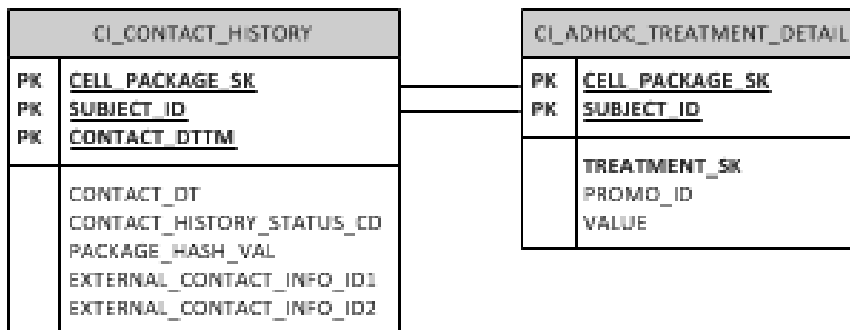


**Display 10: Using SAS® Treatments to Calculate Ad hoc Values**

For every offer – whether it was a standard or ad hoc calculated value, the ordering system required a unique promotion code that corresponds to the offer description and the valid dates for any offer.

A custom process node was developed to be included within all campaigns with offers. This node was attached to the terminal communication node(s) in the diagram and was run at the time of execution. During execution, the offer level per account is calculated for the ad hoc treatments, and written to a custom table within the DBMS, which supported the many to one relationship between the ad hoc treatment and the assigned treatment stored within the SAS CI Common Data Model.

For each unique promotion value, the process assigns the next promotion code. This code is written to another custom table within the customer’s DBMS at the time of execution.



**Figure 3: Storing Custom Treatment Details**

The process worked by maintaining a master data source, in this case a SAS data set, with the last assigned promotion code. The code locks the master data source prior to executing to avoid concurrent access to the master data.

Once locked, a simple algorithm advances the promotion codes per record and assigns the next available promotion code value. When the process is complete, all rows are written out to the appropriate target tables. The final promotion code is updated in the master data table and the data set is unlocked for others to access.

```

/* lock seed table */
%macro trylock(member=maseed.&seedfile.,timeout=100,retry=10); /* timeout = total time to try,
retry = num seconds between tries)*/
  %local starttime;
  %let starttime = %sysfunc(datetime());
  %do %until(&syslckrc <= 0 or %sysevalf(%sysfunc(datetime())) > (&starttime + &timeout));
/* loop will repeat until successful lock or timeout*/
  %put NOTE: ***Trying to open...;
  data _null_;
  dsid = 0;
  do until (dsid > 0 or datetime() > (&starttime + &timeout));
    dsid = open("&member");
    if (dsid = 0) then rc = sleep(&retry);
  end;
  if (dsid > 0) then rc = close(dsid);
  run;

  %put NOTE: ***Lock Table;
  lock &member;
  %put NOTE: ***Return Code on Lock Attempt = &syslckrc;

  %end;
%mend trylock;
%trylock;

/* read seed into work */
data _null_;
  set maseed.&seedfile.;
  call symput("PromoID",promo_id);
run;

data work.FileNm (keep=cell_package_sk treatment_sk promo_id row_update_dttm );
  retain nPromoID; /* next promo id */
  length nPromoID $6 row_update_dttm 8;
  format row_update_dttm datetime20.;

  set work.FileNm end=EOF;
  if _n_ = 1 then do;
    nPromoID = "&PromoID.";
  end;

  >>insert custom algorithm to assign next valid promotion id value to var nPromoID here<<
  Promo_id = nPromoID;
  row_update_dttm = datetime();
  if EOF then do;
    call symput("nPromoID",nPromoID);
  end;
run;

/* update seed */
data maseed.&seedfile.;
  set maseed.&seedfile.;
  promo_id = "&nPromoID.";
end;
run;

/* clear lock */
lock maseed.&seedfile. clear;

/* Update custom treatment table in Common Data Model */
proc append base= macdm.ci_adhoc_treatment_detail
  data= work.FileNm force nowarn ;
run;

```

At the end of the process, all of the values for fulfillment of the communication and the operational system are available for a custom export to the appropriate downstream partners.

## CONCLUSION

Every organization has unique implementation needs driven by their products, channels, and partners. The three cases detailed in this paper were selected to demonstrate how SAS<sup>®</sup> Marketing Automation is designed to be flexible and configurable to help marketers break through the clutter and connect with their customers. Out of the box, the tool makes selecting and segmenting customers easy for business users with a visual display of complex data systems. Each component, including the SAS<sup>®</sup> Treatment Facility, is configurable to allow marketers to create and assign messages and offers to achieve their marketing objectives. For more complex assignment, reporting or operational needs, custom processes written in SAS<sup>®</sup> code can be fully integrated with the solution to extend its capabilities.

SAS<sup>®</sup> Marketing Automation allows marketers to not only present highly personalized communications and offers to their target audience, but to later analyze the results of the communications and adjust future campaigns based on those results. Using out of the box functionality, combined with the ability to customize, gives marketers a distinct advantage in executing marketing programs, saving time and money. This power, the power of SAS, can help companies large and small and anywhere in between achieve success using a One-to-One Marketing Process.

## CONTACT INFORMATION

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