Campaign Builds: Three Smart Ways to Boost Performance

EXECUTIVE SUMMARY

Email Marketing Delivery focuses on four primary functions– Creative ,Integration, Delivery and Analytics. Integration is the broad term used to describe data processing and scrubbing functions while Delivery involves Data Segmentation, Personalization and the campaign build process.

The delivery process hogs database resources and renders the system unavailable and / or too slow for other contenders like online subscriptions, data loads and reporting. Marketers need to manage the Delivery process effectively is the key to ensure predictable campaign delivery, high availability to competing processes and in case of SAS based platforms – direct Customer Satisfaction. Enhancing the Campaign Build Process can be approached from three fundamental perspectives:

• **Technical:** Managing the Build Process external to the e-Marketing ecosystem

• **Operational:** Identification and Contention Management amongst competing processes

• **Design:** Database Design & Structural Rationalization

Introduction

Email Marketing is a cornerstone of a marketeer's strategy to reach out to consumers even though it be a part of a bigger multi channel approach.

The relatively low cost of bulk email and the significantly higher ROI of this channel almost guarantees that the Email Channel is not going away in a hurry.
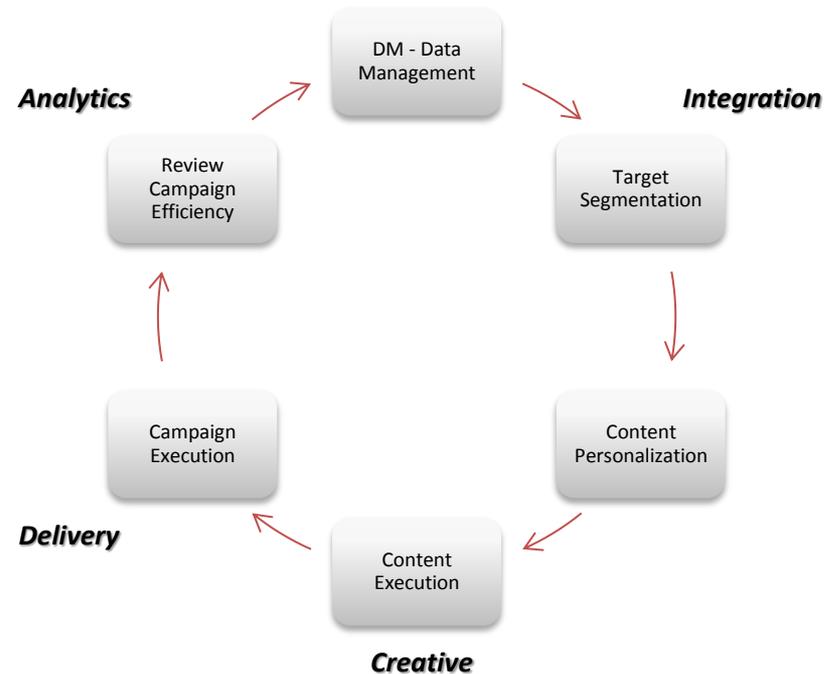
The four delivery phases of Email Marketing are marked in the diagram above.

• **Creative:** Creating & Editing Email Content and Link Up Pages
• **Integration:** Data Management, Cleansing and Import Functions
• **Delivery:** Campaigns, Segmentation, Personalization and Campaign Build Process
• **Analytics:** CED (Campaign Event Data), ROI, Link Tracking etc

The Campaign Build Process and the Levers

The high level process is a 3 step breakdown.
• Query the Customer database based on the Segmentation Rules
• Execute Personalization rules set up by the Marketer.
• Merge Content (Static & Dynamic) from the asset library / CMS.

A detailed WORK FLOW of the campaign build process is depicted below,
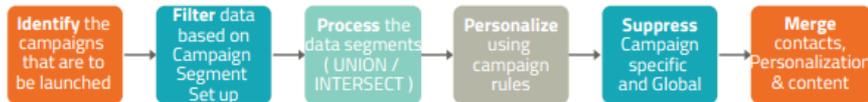
Performance of a campaign depends on a plethora of factors like

• No of active customers
• Concurrent Processes
• Data Model & Skew
• Segmenting Complexity
• Personalization levels

Some of the levers mentioned above can be tweaked to improve the overall performance and fall typically under three broad categories – Platform Architecture, Operational Process and Database design.

Market Drivers

Time to Customer

• Marketing Campaigns, potentially addressing millions of prospects need to get through the door in a marketer specified time window.
• Service Campaigns like Drop Out Remarketing, Online Order Confirmation, Acknowledgement, Customer Welcome etc. need to reach out almost instantaneously

Infrastructure

High volume campaigns consume RAM, Computing Power and system resources putting stress on the native infrastructure. In these days of co-hosting and SAAS based platforms, campaign performance can impact other concurrent processes like data loads, event data exports, and in cases even other clients, who share the same ecosystem.

Support

Human Bandwidth required in terms of support and maintenance activities can potentially increase by as much as 15-20% purely for monitoring, Live performance management and Customer L1 Support.

Maintenance

Infrastructure Hygiene & house keeping activities become complex and windows become unpredictable, challenging the Platform provider's capability to maintain downtime SLAs.

SOLUTION

The campaign build process merges contacts, segmentation criteria, personalization, global exclusions and static / dynamic content essentially doing a "MERGE" operation of multiple datasets with content.

The process output is queued up at the Mail Transfer Agent (MTA) or "Factory" as it is commonly termed and the email blasting process commences. There are multiple facets to enhancing campaign performance using a combination of analytical, technological and operational preventive measures.

Technology Perspective:

Solution: Move the Build & Merge process outside the operational Email Marketing database.

Benefits:
• Reduced DB Locking : Crucial DB Objects Like Contact Lists and Attribute tables are freed up.
• Reduced Latch / Lock Manager contention and fewer dead locks.
• Accelerated Data Processing– Customer Data Imports are accelerated --new customers get into the system faster.
• Increased OnLine Subscriptions -Database is free to manage customer preferences, subscriptions , registrations
• Improved Event Data Exports : Event Data exports get faster due to availability of crucial DB resources.

Implementation: Moving the build process to an external repository is a challenge necessitating changes in Platform Architecture, Design and the overall Campaign Delivery Process. It could involve building new connectors , asynchronous call back and queuing mechanisms in order to make the external repository integrate with the current architecture. Some of the considerations in choosing an external repository are listed below,

S.No	Consideration	Repository Type
1.	Licensing	Open Source / Licensed
2.	Architecture	In Memory / File Based , Data Persistence
3.	Technology	NOSQL / Relational
4.	Support & Maintenance	Availability of Support / Forums
5.	Skill	Availability of Skill Set in Market
6.	Load	Avg & Peak Load on Process
7.	Infrastructure	Computing , RAM & Space needs
8.	Integration	Queue Managers & Middleware Compatibility

The modified process architecture looks like the Figure 1 depicted below.
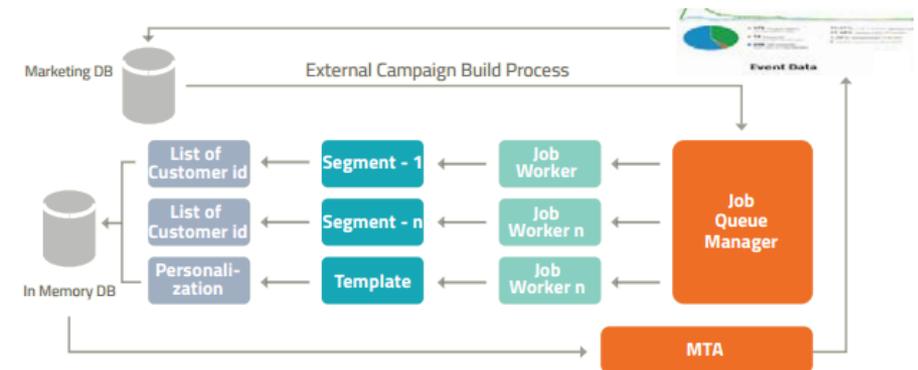
The Campaign Build Process was artificially replicated under two testing environments

• A traditional RDBMS hosting the customer data and managing the build process internally.
• RDBMS Hosting the data and the build process running out of a NOSQL – In Memory DB.

The actual test conditions and results from the "Externalization" of the Campaign Build process are beyond the scope of this paper but some of the Positive outcomes of the experiment was a clear drop in memory footprint, significant performance improvement across the segmentation, personalization and content merging processes by over 100% for a sample size of a million customers.

The benefits while using the NOSQL In-Memory database can be attributed to the following reasons.

• Horizontal Scalability of the IN-Memory database
• Improved Processing Efficiency since DISK IO was minimized
• Reduced memory foot print and contention for system resources
• Parallel Processing through concurrent Worker threads

The following comparison depicts the kind of performance gains observed when executing the campaign build process using an In Memory NOSQL database ecosystem. The tests covered 3 categories of systems – RDBMS, In Memory NOSQL and In Memory NOSQL with three Parallel Job workers. All outputs were measured against the same CRM Database hosting 1 million customer records across 10 tables of personalization and supplemental information.
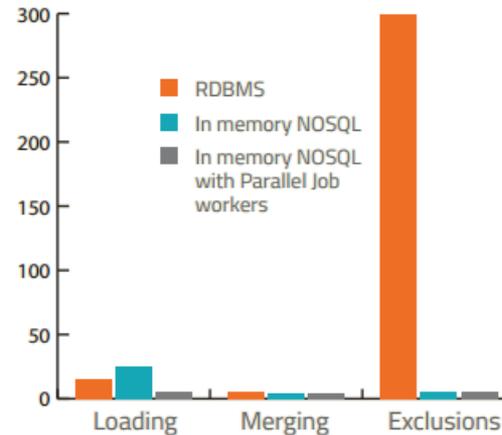
Fig: Campaign Build Process Trial Comparisons

Operational Perspective:

Managing a fully functional Marketing database is a challenge primarily due to the usage patterns that it needs to cater to. Some of the Use cases an email marketing database needs to exhibit are listed below.

• Online Transaction Processing - for opt-in Management , preferences and Transactional Messaging.

• Data WareHouse
    • Extract, Load and manage millions of demographic, transactional and behavioral data
    • Manage and Effectively Utilize Event Data for segmentation and reporting
    • Merge and Query Massive data sets for Effective Targeting.

• Reporting
  • Data exports on campaign efficiencies and ROI
  • Campaign Trends & Response Variance Analytics

A primary area where the use cases seem contra indicatory are Data Load Jobs and Campaign Launches. Both are business critical, time sensitive and contraindictory –one being a bulk data import and the other a data crunching background process. Scheduling Campaign Launches and Load Jobs appropriately is critical since both tend to use the same database resources / objects and can quickly tie each other down creating dead lock scenarios depending on the underlying technology.

It is important to correlate these adjunct activities from frequency, intensity and duration perspectives in order to predict and manage system load. The following days in life chart depicts the contention that a typical Email Marketing database goes through.

Figure 2: Launch & Load Jobs Scheduling

This chart (Fig 2) depicts the Data Load / Campaign launch identifier on the X axis and the scheduled time of the day on the Y dimension. The Red colored dots indicate the times of the day when concurrent jobs and campaigns could potentially come into conflict. This information by itself is only an indicator since intensity or the load on these jobs / campaigns is still not evident.

The following graph (Fig 3) is a more analytical report which combines the schedule with the average time consumed for the launch or load job. The X axis indicates the Job / Campaign identifiers and the Y axis the schedule. The intensity of the process is indicated by the length of the execution process as the average duration of the load or campaign process over the last 30 days.

Fig: Data Entities in an email Marketing system
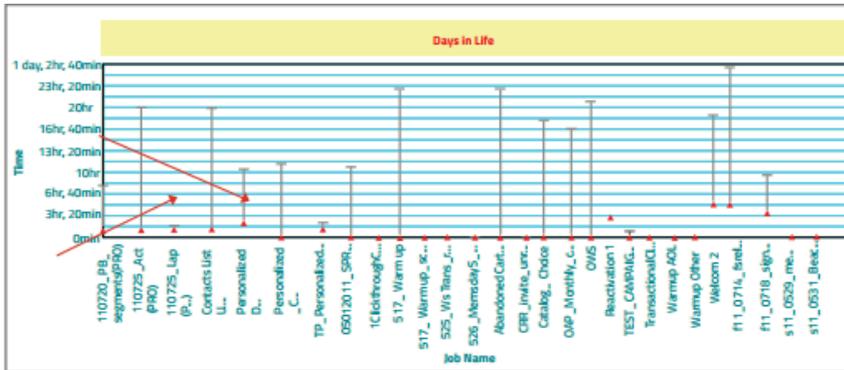
This kind of "Contention Analysis" is highly useful tool in deciding operational strategy, System House keeping, maintenance requirements and ultimately managing campaign performance.

Design Perspective

The data structures around an Email Marketing database need to cater to the four sources of data that are used across a Campaign Build Process as shown in (Fig 4).

The four sources of information need to rationalized from a data design perspective in order to expedite the Campaign Build Process and there is generally a contextual tradeoff between normalization and using wide columns views. There is a plethora of areas available to tweak and rationalize the structures that can provide high returns.

Some areas that that can directly benefit the campaign build
process are listed below:

Function	Design
Subscriptions /Opt Ins	▪ Manage subscription alongside basic demographic information
Segmentation-Inclusions	▪ Keep Filtering Criteria to a minimum ▪ Use Re-defined Cut Lists if targeting a small percentage of the ecosystem ▪ Use a well designed indexing approach
Segmentation-Exclusions	▪ Use positive inclusions by manipulating data rather than negative exclusions
Suppressions	▪ Maintain Configurable Global Exclusion Lists – not campaign Specific Supressions ▪ Scan customer data periodically to flag Global exclusions as part of Contacts Management
Data Hygiene	▪ Good House Keeping –Space and Cache Management ▪ Identify unused Indexes and redundant database objects ▪ Schedule "Invalids Management" processes regularly using Bounced Stats, Deliverability data and Marketeer inputs
Event Data Management	▪ Use Roll Ups like Last Date Clicked, Last Date Purchased etc rather than campaign level stats for Filtering