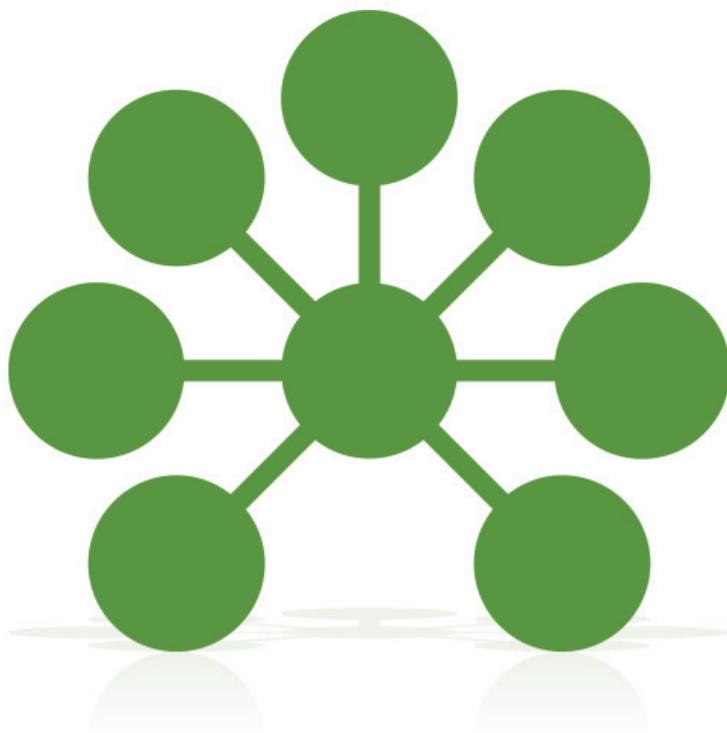


# Turning Big Data into More Effective Customer Experiences

Experience the Difference with Lily Enterprise



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## Confidentiality

The information (to be) received, together with any analysis, compilations, studies or other documents prepared by NGDATA, is considered confidential. The customer undertakes the necessary measures to maintain strict secrecy concerning the information, to protect the Information from direct or indirect access by any other party and to neither directly or indirectly use the Information in any manner for itself or any other party.

## Purpose of this Document

This document is a solution description, based on the general information about NGDATA's solutions and services. This information is gathered based on good faith.

## The Conceptual Solution

### About NGDATA

NGDATA is the **customer experience management** solutions company that enables organizations to maximize the value of their customer relationships. Through its breakthrough solution, Lily Enterprise™, companies can create individual and extensive customer profiles, in real time, resulting in highly effective targeting for more personalized customer experiences.

NGDATA empowers enterprises to **Listen bigger** to all customer interactions utilizing Big Data technologies, **Learn faster** from behavior and contextual information, creating more effective actionable insights, and **Execute smarter** on these insights to better find, optimize and engage targets.

### The Solution

NGDATA proposes to use Lily™ Enterprise to implement the strategy for customer centricity that is able to listen, learn and execute, using the available data sources and business workflows. With Lily, companies can better:

- **Listen** across many different digital channels, collecting every interaction related with behavioral, operational and socio-demographic observations.
- **Learn** based on individual customer behavior (such as offer responses) to generate an individual profile- customer DNA- and individual customer preferences. “Lily learns” is a key differentiating function and is the most effective adaptive learning engine.
- **Execute** upon customer activity based on simple instructions for how to find, optimize and engage targets. It adapts to real-time input to deliver highly relevant offers.



Figure 1. Lily Listen - Learn - Execute Approach.

## The Lily Customer DNA

The heart of the system is the Lily Customer DNA™ – variables and values that describe each and every user in a very detailed way. The Lily Customer DNA contains 1000s of (out of the box) socio-demographic values, scores describing mobility, communication preferences, spending behavior, customer engagement and more.

The DNA is built in an automated and real time manner – based on source data and interactions ingested into Lily. The DNA contains values coming from source records, or scores, derived from the ingested data, calculated at ingest time, rather than batch-mode. Those scores are calculated for each individual customer, and kept and enhanced over time. Apart from predefined metrics, Lily also allows companies to define additional – company specific – metrics that are relevant for the business of the company.

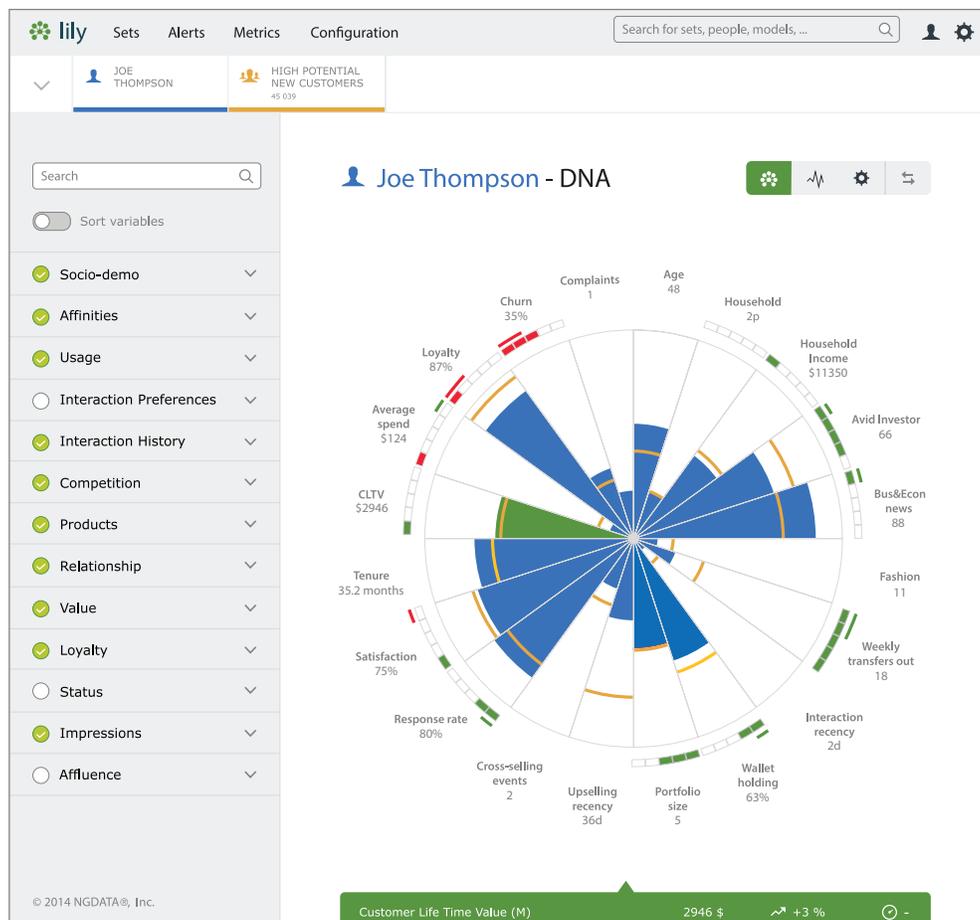


Figure 2: Lily Customer DNA.

All DNA variables are kept up to date, for each and every individual in the system. As the DNA evolves over time, the data is kept, enabling:

- Trending and prediction of future values;
- Alerting whenever a DNA variable (e.g. Churn score) trends at a certain rate, or reaches a certain value.

The DNA information is available to review through the Lily Interface or using third party software using Lily’s open API’s.

## Lily Preference Learning

While the Lily Customer DNA are attributes or scores that belong to a customer, Lily also allows companies to predict the propensity a customer might have for a new or existing product, a service or a particular offering. This propensity is calculated automatically and based on a number of machine learning algorithms. It is also updated in real time, using all incoming interactions.

Because of the rich Lily Customer DNA, the Lily Preference Learning feature has more data to start from and can come up with better recommendations and analytics, simply because it knows more about individual customers.

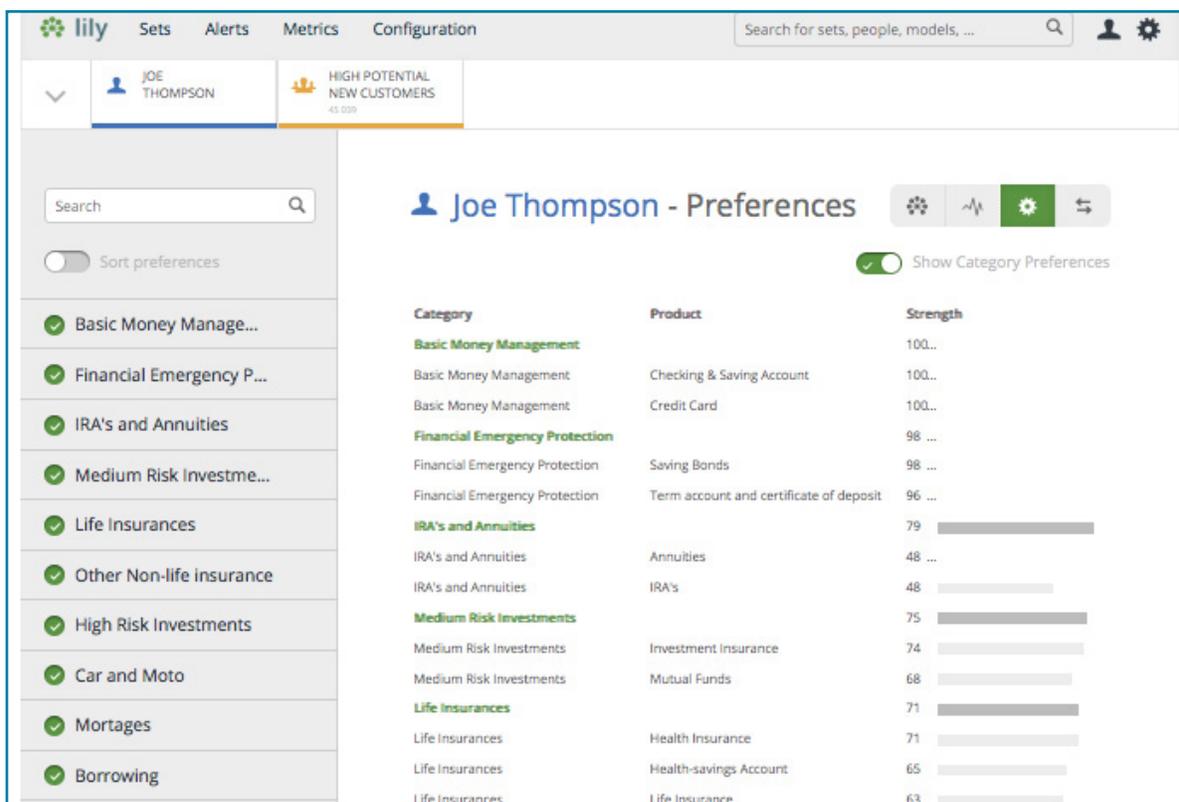


Figure 3: Lily Preference Learning.

## High Level Architecture

The high level architecture is illustrated in Figure 4. Lily Enterprise will host all customer information. All the data is ingested into Lily and used for customer insight and profiling.

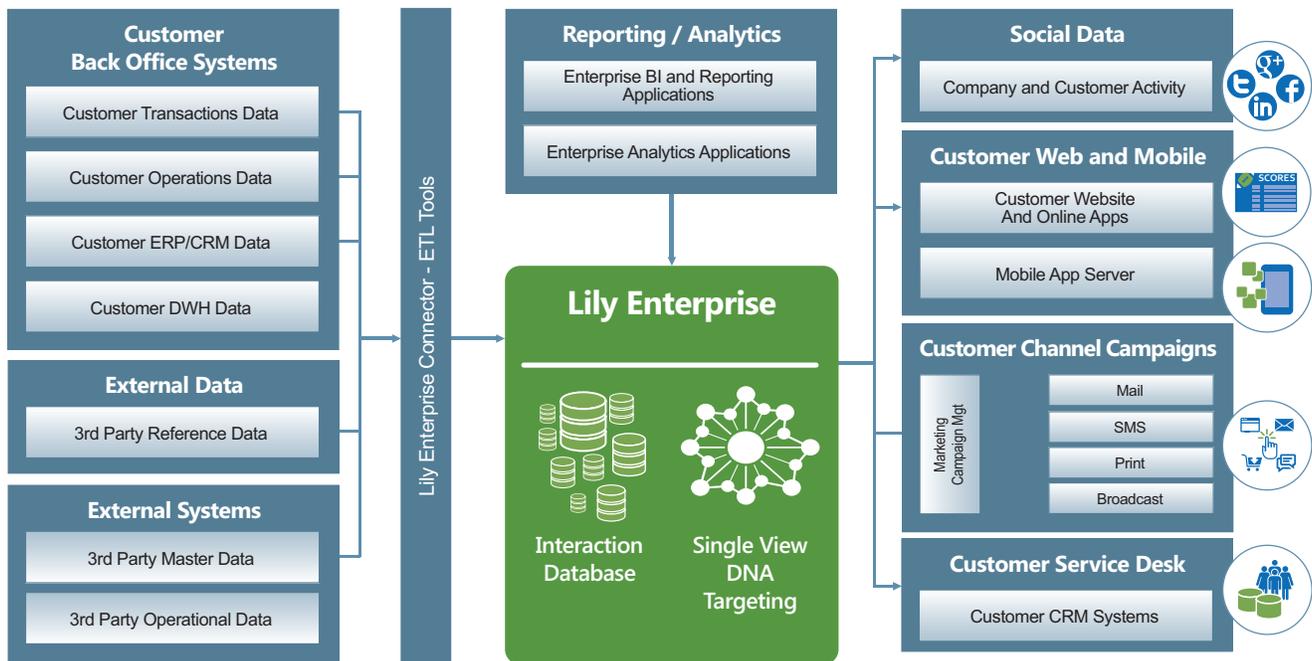


Figure 4: High Level Architecture.

Lily integrates with a number of other tools in the ecosystem: ETL tools to facilitate the ingest of data, third party reporting and modelling. Underlying API's are based on REST, Java, JDBC or Hive protocols.

The Lily Enterprise solution has the following key features:

Lily not only stores structured and unstructured information- out of the box- it also adds the following insights:

- Lily organizes the data in a customer centric model, based on **industry specific data models**. Although those models can be extended if desired by the company, the models do not have to be designed or built- they are already in the software.
- Based on the available data, Lily generates a **Lily Customer DNA profile - for each and every end customer in the system**. Apart from social demographic information, that profile contains life stage events, affinities and interests (for sports, leisure, science, business...), lifestyle values, mobility information, communication preferences, predefined segments, customer status, etc., and a number of scores, including risk scores, etc.
- Lily also **predicts the propensity for certain events**- product purchases, churn, reacting to an advertisement, redeeming a coupon, etc.

Lily is a **real-time and interactive system**- reference implementations include real time interactions with e.g. a mobile wallet, a website, etc. As scores are updated in real-time, Lily offers the latest information and does not require nightly batch jobs. As a result, Lily does not only help understand why something has happened (as more classic BI tools do), Lily can also **drive your actions by suggesting what to do when customers interact with the company**.

Lily **learns** and builds and stores a detailed individual customer profile (DNA), which gets richer every time new information is ingested. Lily builds a 100% objective customer detail. As opposed to rule based systems where more general rules (often human assumptions) are applied. Those systems don't learn, and tend get complicated and hard to maintain after a while as more rules get introduced.

## The Technology Platform

Lily is an application built using Big Data software components such as Hadoop (HDFS) and Hbase. Lily runs on top of Cloudera's distribution, and on commodity hardware or Cloudera based appliances.

The storage of all the interactions, the raw data, the DNA and the preferences is done in a customer centric database, built on the above technologies and using an industry specific data model, including the DNA model and the Preference model.

The central database consolidates data coming from different sources, ingested in streams (real-time) or in batch, as necessary, often via ETL tooling.

As such, Lily combines all the siloed data into one central system – using Big Data technology. This is illustrated in Figure 5.

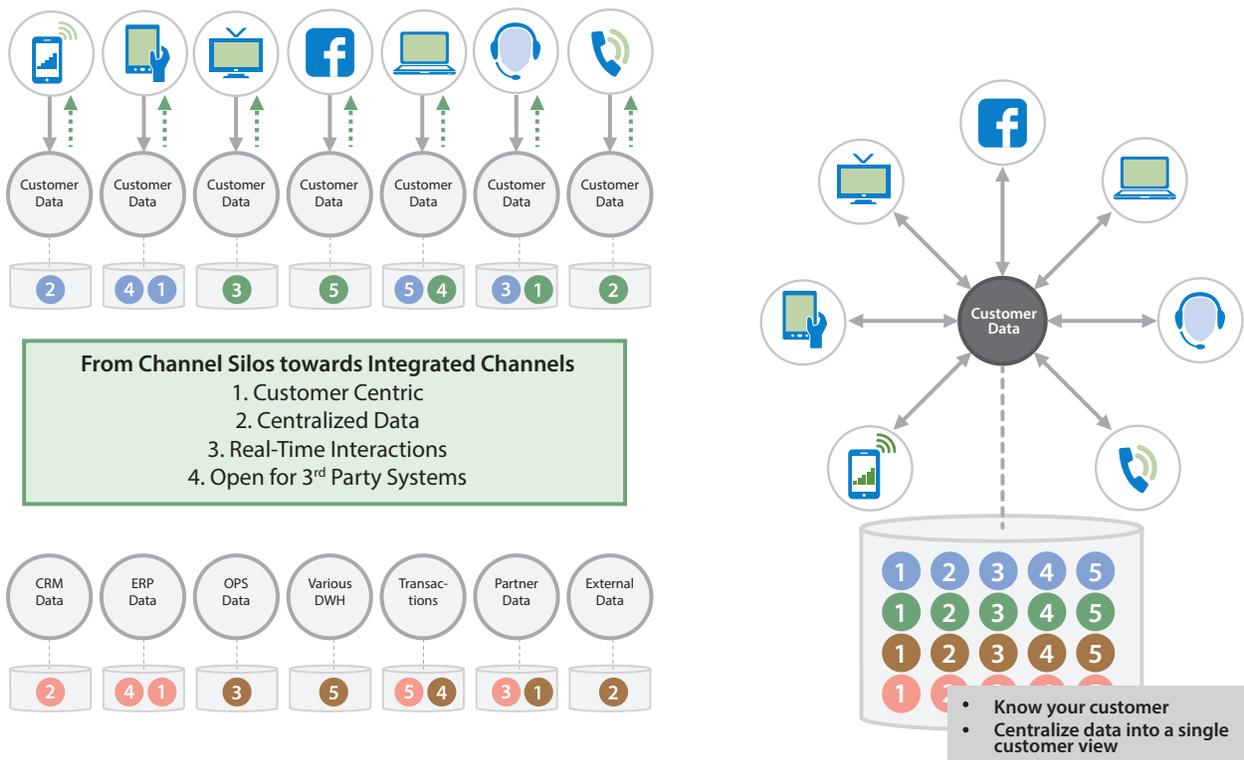


Figure 5: From siloed data to a customer centric system.

## The Value Proposition - Benefits for Lily Enterprise Users

### From a business perspective

Using Lily Enterprise™ companies are able to create more focused and targeted offers based on a better understanding of each and every individual customer:

- Increasing redemption rates for targeted offers
- Reducing churn rates
- Increasing customer acquisition rates
- Increasing ROI of marketing campaigns

Next to this increased effectiveness, there is also the advantage of more efficiently using budgets and resources. Because you know your customer installed base better, it requires less resources to address those users that are interested in particular offerings, marketing campaigns, content, etc., and your resources become available to start other sales and marketing initiatives.

As a result, you will also achieve greater customer satisfaction, loyalty and retention through meaningful offers that match customer needs and interests for greater overall Customer Lifetime Value (CLTV).

Lily Enterprise™ is software solution that has those features available out of the box – allowing companies to implement a customer centric approach in a short time to market, and in a very cost efficient way.

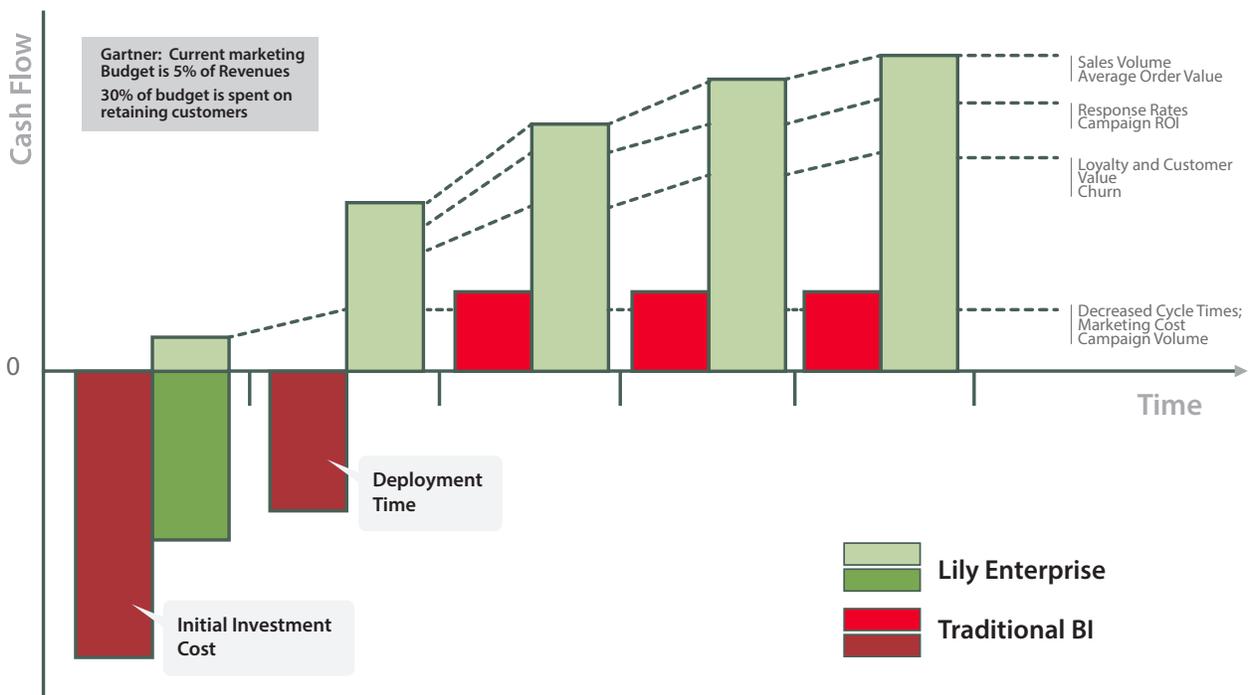


Figure 6: Lily Enterprise Time To Market

## From a technology perspective

- Lily allows companies to store more information, and to create value from the massive amounts of data held within organizations, not yet being fully utilized. Lily uses the key advantages of Big Data: volume, velocity and variety in order to deal with structured and unstructured information in a flexible and cost efficient manner.
- Lily is an Enterprise Business Application, not a development platform or a workbench. As a consequence, there is no need to build and maintain a custom application.
- All technology is real-time, automated and interactive, you have the latest information available at your fingertips, avoiding complex and lengthy batch jobs.

To discover more about NGDATA or how Lily Enterprise can help you solve your customer experience management challenges, please go to [www.NGDATA.com](http://www.NGDATA.com) or contact us at [info@NGDATA.com](mailto:info@NGDATA.com).

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