

# Hospital Drug Supply & Demand Simulation & Forecasting Solution

## Case Study

Predicting hospital drug supply and demand to minimize drug waste and maximize revenue using TeraDrug Solution™

## About The Client

Group of hospitals of various sizes across the country.

## Overview & Problem Statement:

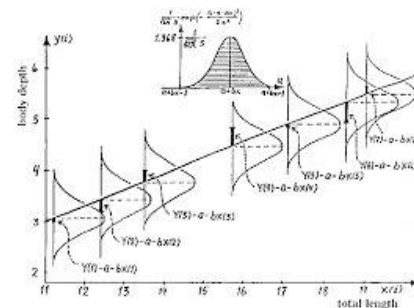
A major Healthcare system, considering the exorbitant amount of money the business was spending on Drug cost across its hospitals, decided to develop an understanding about what was driving the procurement, prescription, cost-structure, and waste. In addition, they wanted to understand the comparative situation at their geographically distributed hospitals and the role the physicians play in the overall Drug administration scenario. A successful outcome will provide a deep insight into the Drug procurement, prescription and consumption chain as well as provide insight into reducing overall cost of operation including Drug costs.

## TeraCrunch Solutions

TeraCrunch team was provided access to the Healthcare system-wide Claims data, comprising of tens of hospitals for the past 2 years. This data included the information about the diagnosis provided to the patients, the physicians who provided the diagnosis, the procedures connected with the diagnosis, the drugs administered, the cost data, the vendor data and the procurement details of the drugs over this two year period. This data originated from multiple IT systems.

TeraCrunch Data Scientists, with an average of 25 years of data analytics experience in Healthcare industry behind them, spent around twelve (12) weeks understanding the data models of the applications from where the data originated, created a data model map and established correlations between the data elements that would be used for further analysis and data preparation work.

CLM_ID	Diagnostic code			Procedural codes		
	DIAG_CD	DIAG_CD2	DIAG_CD3	PROC_CD	PROC_CD2	PROC_CD3
15146H00D000	V1229	V1229	29384	NA	NA	83036
15146H00D000	V1229	V1229	29384	NA	NA	80061
15146H00D000	V1229	V1229	29384	NA	NA	80050
15146H00D000	V1229	V1229	29384	NA	NA	36415
15147F3BD200	30021	NA	NA	NA	NA	90834
15148H134800	V7231	V016	5411	NA	NA	88175
15148H134800	V7231	V016	5411	NA	NA	87591
15148H134800	V7231	V016	5411	NA	NA	87491
15148H03D900	78060	78079	NA	NA	NA	99213
15148H03D100	7231	7295	7224	NA	NA	99213
15189H10FD00	78903	NA	NA	NA	NA	99213
15188H038D00	V762	NA	NA	NA	NA	88175
15188H039600	462	V1200	NA	NA	NA	87430



The Data Scientists used the insight from the data and used the TeraCrunch library of algorithms for Healthcare and revised an existing predictive model to gain further insight into the diagnosis, prescriptions and physician behavior. In preparation and fine-tuning of this model, available data distributions were analyzed. The data threw up a number of outliers in terms of physicians, hospitals and drugs. This information would be very valuable in future to make accurate forecasts and predictions.

## Impact on the Business

We were able to demonstrate that using the TeraCrunch predictive solution, we will be able to reduce the overall Drug spend by over 10%. The analysis also provided insight into the physician preferences and the hospital behavior. We provided training to the Healthcare system personnel and believe they will be able to continuously improve the operational performance using the data analytics tools at their disposal.

## TeraCrunch Platform

### TEXT ANALYTICS ENGINE

Transform data into meaningfully defined topics and associations: events, numbers, things, people, places and the patterns & correlations between them

### INSIGHT2™ MODULE

Pre-built algorithmic models designed to pinpoint associations and propensities in the data, predict change over time, identify instabilities, variation ranges and anomalies

### DATA EXTRACTION

Enables comprehensive and rapid collection of data from Customer Data Sources, Internet, Social-Media and other sources and prepare the data for further synthesis

### TECHNOLOGY

Machine Learning Algorithms, Natural Language Processing, Knowledge Engineering, Statistical & Computational Models, R, WEKA, MongoDB

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