Chapter 2
Improving Forecasting for Customer Service Supply Chain Using Big Data Analytics

Kedareshwaran Subramanian
T. A. Pai Management Institute, India

Kedar Pandurang Joshi
T. A. Pai Management Institute, India

Sourabh Deshmukh
H. P. Inc., India

ABSTRACT

In this book chapter, the authors highlight the potential of big data analytics for improving the forecasting capabilities to support the after-sales customer service supply chain for a global manufacturing organization. The forecasting function in customer service drives the downstream resource planning processes to provide the best customer experience at optimal costs. For a mature, global organization, its existing systems and processes have evolved over time and become complex. These complexities result in informational silos that result in sub-optimal use of data thereby creating inaccurate forecasts that adversely affect the planning process in supporting the customer service function. For addressing this problem, the authors argue for the use of frameworks that are best suited for a big data ecosystem. Drawing from existing literature, the concept of data lakes and data value chain have been used as theoretical approaches to devise a road map to implement a better data architecture to improve the forecasting capabilities in the given organizational scenario.

INTRODUCTION

In any global manufacturing organization, as highlighted by Waller and Fawcett (2013), forecasting is an important dimension of interest from a big data analytics standpoint. From a business process perspective, forecasting using big data analytics can be applied to solve issues related to inventory management,

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transportation management & customer and supplier relationship management. A sample research question in the area of customer and supplier relationship management as cited in the paper by Waller and Fawcett (2013) include - How can more granular sales data from a wide variety of sources that exist be used to improve visibility and trust between trading partners?

The research question which the authors attempt to address in this book chapter is as follows:

How can a global manufacturing organization unlock the value hidden in its big data ecosystem to build better forecasting capabilities for its after-sales customer service supply chain?

This question is of great relevance to any global manufacturing organization which services customers across different parts of the world. From a business process perspective, the post-sales customer service function can be broadly sub-divided into the following operations:

1. Customer support contact center (over different channels – phone, web & service centers).
2. Spares management.
3. Field service technician organization.

In such global manufacturing organizations, more often than not, each of these three operations are managed as a separate entity with each operation creating its own set of planning processes and internal IT systems. Part of the reason being that global organizations are serving customers across different geographies - North & South Americas (NSA); Europe, Middle-East & Africa (EMEA) & Asia Pacific (APAC). Each geography would have its own strategic business units (SBU's) which have its localized operations and thereby creating its own systems to handle the post-sales customer support function. This eventually leads to having a fragmented view of the customer support function and poor forecasting capabilities for this customer service function as a whole.

From a technology standpoint as well, as discussed by Kumar and Deshmukh (2005), companies which followed the data mart bus architecture began by creating dependent data marts organized for each function such as customer service, procurement, finance, planning and quality.

As a result, today in most global organizations, every region and function has their own dedicated resources to extract the relevant data from their respective source systems and feed it into their forecasting models. Each of these teams is using their own set of tools and models creating many opportunities for data duplication and redundancy.

However, in reality, in order to service a post-sales customer need, query or issue, each of the three post-sales customer operations - namely customer support contact center, spares management & field service technician organization are inter-related and inter-dependent on each other. As pointed by Davenport (1998), fragmentation of information systems lead to a fragmented way of doing business. This argument is equally applicable in the current context. Fragmentation of SBU's and their information processing systems leads to sub-optimal forecasting capabilities with each region and operation creating its own independent forecast engine. This problem gets further compounded as these forecasts are built at different levels of granularity – forecast type (call –phone/web, spares, spares, field technicians); location (NSA/EMEA/APAC). Ultimately, these have a bearing on the quality of the post-sales customer support provided by the organization.

One of the significant recent developments in IT has been in area of 'Big data analytics'. Earlier, most global organizations developed Business Intelligence (BI) systems primarily relying on structured