Impact of Predictive Analytics in The Supply Chain

Presented By Brian J. Galli
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Agenda

• Role of Big Data
• What is Business Intelligence
• What is Business Analytics & Supply Chain Analytics
• What is Predictive Analytics
• Predictive Analytics in Supply Chain
• Conclusion
• References
A New Era of Computing

We have for the first time an economy based on a key resource [Information] that is not only renewable, but self-generating.

Running out of it is not a problem, but drowning in it is.”

– John Naisbitt
At the World Economic Forum last month in Davos, Switzerland, Big Data was a marquee topic. A report by the forum, “Big Data, Big Impact,” declared data a new class of economic asset, like currency or gold.

Companies are being inundated with data—from information on customer-buying habits to supply-chain efficiency. But many managers struggle to make sense of the numbers.

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“Data is the new oil.”
Clive Humby
Big Data Explained

**Achieve Breakthrough Outcomes**

- Know Everything about your Customers
- Run Zero-latency Operations
- Innovate new products at Speed and Scale
- Instant Awareness of Fraud and Risk
- Exploit Instrumented Assets

**By Analyzing Any Big Data Type**

- Transactional / Application Data
- Machine Data
- Social Media Data
- Content
What is Business Intelligence?

Business Intelligence enables the business to make intelligent, fact-based decisions.
How Important is BI?

Top 10 Business and Technology Priorities for 2011:

1. Cloud computing
2. Virtualization
3. Mobile technologies
4. IT Management
5. **Business Intelligence**
6. Networking, voice and data communications
7. Enterprise applications
8. Collaboration technologies
9. Infrastructure
10. Web 2.0

Source: Gartner’s 2011 CIO Agenda (aka “Reimagining IT: The 2011 CIO Agenda”).
The July 2010 Forrester report “Technology Trends That Retail CIOs Must Tap to Drive Growth” identified the following technologies that retail CIOs should be considering as part of an overall architecture strategy:

- Mobile
- Cloud
- Social Computing
- Supply Chain
- Micropayments
- Business Intelligence/Analytics
Why is Business Intelligence So Important?

Data

Opinion

(aka Best Professional Judgment)

Making Business Decisions is a Balance

In the absence of data, business decisions are often made by the HiPPO.

With Business Intelligence, we can get data to you in a timely manner.
Major BI Trends

- Mobile
- Cloud
- Social Media
- Advanced Analytics
What BI technologies will be the most important to your organization in the next 3 years?

1. Predictive Analytics
2. Visualization/Dashboards
3. Master Data Management
4. The Cloud
5. Analytic Databases
6. Mobile BI
7. Open Source
8. Text Analytics
BI Today vs Tomorrow

- “BI today is like reading the newspaper”
  - BI reporting tool on top of a data warehouse that loads nightly and produces historical reporting
- BI tomorrow will focus more on real-time events and predicting tomorrow’s headlines
Retail Analytics

- Market Basket Analytics
- Text Analytics
- Customer Segmentation/Clustering
- Tailored Product Assortments
- Inventory Forecasting
Collaborative Filtering tries to predict other items a customer may want to purchase based on what’s in their shopping cart and the purchasing behaviors of other customers.
What Is Text Analytics?

...turning unstructured customer comments into actionable insights

...finding nuggets of insight in text data that will improve our business

*From Wikipedia:*

... a set of linguistic, statistical, and machine learning techniques that model and structure the information content of textual sources for business intelligence, exploratory data analysis, research, or investigation
Unstructured Text Processing

Facebook Page
Twitter Page
Call Center Notes, Voice
Competitors’ Facebook Pages
Blogs
Email
Adhoc Feedback
Public Web Sites, Discussion Boards, Product Reviews
Customer Sat Survey Comments

Upload
Categorize
Services
Quality
Cost
Friendliness
Tune

Analyze

Alerts, Real-time Action
What is Information Governance?

Information Governance

PREVENTS

Garbage In

BY ENCOMPASSING

• Data Stewardship
  • Data Quality

• Data Governance
  • Master Data Management
  • Data Stewards for Master Data “Hubs”
  • Customer, Vendor, Product, Location, Employee, G/L Accounts

CREATING SIGNIFICANT BUSINESS VALUE

Garbage Out

BY ENCOMPASSING

• Report Governance
  • Metric Governance

CREATING SIGNIFICANT BUSINESS VALUE
Business Intelligence (BI)

- BI traditionally focuses on using a consistent set of metrics to both measure past performance and guide business planning.
- BI is querying, reporting, online analytical processing (OLAP) and providing ‘alerts’.
Business Analytics (BA)

- BA makes up the skills, technologies, applications and practices for continuous iterative exploration and investigation of past business performance to drive business planning
- A fundamental basis is to use past time series data analysis
- BA is also seen as the ability to see patterns in vast amounts of data and extract actionable insights
- BA makes extensive use of data, statistical and quantitative analysis, explanatory and predictive modeling, and fact-based management to drive decision making
- Business intelligence (BI) is similar but yet different
BI and BA

- BI answers the questions of ‘what happened; how many, how often, where; where exactly is the problem; what actions are needed
- BA can answer questions of ‘why is this happening; what if these trends continue’ what will happen next, what is the best that can happen
- Supply Chain Predictive Analytics is a subset of BI and BA
What is Predictive Analytics

Predictive Analytics helps your organization anticipate change so that you can plan and carry out strategies that improve outcomes.

By applying Predictive Analytics solutions to data you already have, your organization can uncover unexpected patterns and associations and develop models to guide front-line interactions.

With these unique insights you can prevent high-value customers from leaving, develop successful products and product offers, identify and minimize fraud and risk, fight crime, etc. Predictive Analytics gives you the knowledge to predict…and the power to act.

Predictive analytics solutions analyze patterns found in big data to predict potential future outcomes
Supply Chain Predictive Analytics (SCPA)

• Extracts, analyses and presents SCPA performance data to provide measurement, monitoring, predictive/analytical modeling, forecasting and SC management

• Identifies trends, performs comparisons and highlights opportunities in SC functions even when large amounts of data are involved

• Leverages investments in IT enterprise solutions, web technologies, data warehouses and locates patterns amongst transactional, demographic and behavioral data
SCPA Usefulness

• Enables monitoring on end-to-end basis
• Covers all SC functions and processes
• Alerts problems and exceptions by predefined thresholds, alerts and triggers
• Ensures data visibility and transparency
• Serves as the ‘performance’ dashboard’
• Identifies problems for trouble shooting
• Becomes an analytical decision making tool
SCPA Benefits

• Reduces direct and indirect costs and improve profitability
• Enables holistic view by consolidating data from multiple systems
• Applies algorithms and decision rules for meaningful procurement information
• Minimizes risks of SC disruptions
• Maps bought products-suppliers matrix to focus on supplier-positioning and supplier-perception models
• Supports supplier management decisions on optimal sourcing strategies
• Streamlines SCM through collaborative processes for information exchange across SC partners
Predictive Customer Analytics

Predictive Analytics can help you act smarter by helping you:

- **Acquire** the ideal customers
- **Grow** your customer relationships
- **Retain** your most valuable customers
Predictive Operational Analytics

Predictive Analytics can help you act smarter by helping you:

- **Manage** your operations
- **Maintain** your infrastructure
- **Maximize** capital efficiency
Predictive Threat & Risk Analytics

Predictive Analytics can help you act smarter by helping you:

- **Monitor** your environment
- **Detect** suspicious activity
- **Control** outcomes
Driving Smarter Business Outcomes

Capture

Predict

Act

Text Mining

Data Mining

Statistics
The “Predictive Payback”

**Telecom**
- Reduction in customer “churn” rate from 18% to 2%, increase in sales (Cablecom)
- 26% reduction in customer “churn” rate, annual net benefit of $3.8m, payback within 5 months (XO Communications)

**Retail**
- 25% increase in campaign response rate, 15% increase in sales, pay back after first campaign (Neck & Neck )
- 30% reduction in supply chain costs, increase in sales (Elie Tahari)
## The “Predictive Payback”

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<thead>
<tr>
<th>Insurance</th>
<th>Manufacturing</th>
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<tbody>
<tr>
<td>Doubled accuracy of fraud</td>
<td>Saved $1 million in repair costs in less</td>
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<tr>
<td>identification, reduced time</td>
<td>than 2 weeks, decreased overall machine</td>
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<tr>
<td>to refer suspicious claims</td>
<td>downtime by 20% (US construction equipment</td>
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<td>from 14 days to 24 hours,</td>
<td>manufacturer)</td>
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<tr>
<td>payback in 3 months (Infinity)</td>
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Linking SCM Measures to Business Performance

- **Cost reduction achieved by**
  - Reducing inventory
  - Reducing logistics expenses
  - Reducing direct and indirect material expenses

- **Improving revenue and profitability by**
  - Selling higher margin products
  - Achieving higher market share
  - Reducing backorder and lost sales
  - Attacking new markets
  - Decreasing supply time to market

- **Improving operational efficiency by**
  - Reducing procurement expenses
  - Increasing asset utilization
  - Delaying capital expenditure

- **Reducing working capital by**
  - Reducing inventory
  - Reducing accounts receivables
Enhancing SC Performance

• Balance between cost and customer service
• **SC optimization**- improving SC elements like demand management, forecasting, inventory control, and transportation efficiency amongst others
• **SC integration**- better intra- and inter- firm integration thro’ improved organizational structures and processes
• **SC restructuring**- major changes in supply chain configurations for all flows especially for new products
Achieving SC Excellence

- Make cultural and attitudinal change (beyond mere metrics)
- Break organizational barriers thro’ better communication, coordination and collaboration
- Bring about transparency and visibility
- Manage thro metrics and analytics
- Enable faster, improved, data-based decision-making
- Achieve agility and flexibility thro better responsiveness to external (sourcing/market/competition) and internal (supply processes and systems) factors
- Use networking tools like VMI, EDI, CPFR, joint cost reduction and vendor development programs
Executing SC Excellence

- **Value impact analysis** - evaluating metrics to identify KPIs
- **Blueprint for future** - identifying corporate goals/strategies to suitably configure SC elements for performance
- **Roadmap for success** - building blocks and steps towards the blueprint
- **Implementation** - actually executing plans with time-bound milestones and targets
- **Measurement/feedback** - tracking metrics, periodic reviews and corrective actions

**Ultimately, all improvement moves should lead to superior SC performance and consequent successful business performance**
Conclusion

• BI, BA, and Predictive Analytics are intertwined and provide benefits to each other.

• The application of Predictive Analytics in the supply chain has emerged and taking a larger role in how supply chains are established and management throughout from raw materials to distribution/sell off.

• The use of Predictive Analytics in the supply chain provides several benefits but in order to use it effectively, an organization must couple Predictive Analytics with other tools such as BA, BI, Continuous Improvement, and Project/Operations Management.
Discussion/Questions

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References

