Big Data has been the “it” term in business for nearly half a decade but few organizations have really leveraged big data technologies to produce tangible benefits. Technology companies have been at the forefront of big data adoption and so far have reaped most of the benefits. Communication service providers generate a wealth of data that can be harnessed to provide a real return on investment.
Adoption of Advanced Analytics Solutions

Emerging technologies seek to change the single purpose paradigm in enterprise IT and bring together data from various sources. Big data technologies excel at bringing together both structured data, often generated by single purpose IT systems, and unstructured data, often generated by events such as a customer action.

Figure 1: Stages in Analytics Maturity

A few organizations so far have successfully leveraged the power of big data, leading technology companies are among these few.

Several technology companies have not only invested in big data but have also developed in-house expertise with a deep understanding of big data technologies. Investments from Google and Facebook came at a time when there was limited understanding and availability of big data tools. These tech giants identified a business need and subsequently invested in developing technology to solve this need.

For example, Google Labs developed MapReduce, an algorithm, in early 2000s to address challenges in efficiently processing large volumes of data. MapReduce subsequently became the inspiration behind the creation of Apache Hadoop (a key big data technology).

Similarly Apache Cassandra (another big data technology) was initially developed at Facebook out of a need to efficiently store and quickly retrieve data for hundreds of millions of users.

Google and Facebook both employ data scientists and big data technology experts that are tasked with solving challenges using data. A drive to solve problems and an appetite
for experimentation has enabled these organizations to use big data to not only reveal new insights, but also adapt and improve existing solutions, ensuring resilience.

Adopting big data technologies to leverage large volumes of structured and unstructured data has enabled new revenue streams, streamlined costs and improved customer service levels for technology companies.

In many cases embracing a data driven problem solving approach has enabled technology companies to disrupt incumbent players with business model innovation.

Figure 2 highlights a few examples of technology companies leveraging large volumes of data to provide new and improved sets of services.

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**Figure 2: Select Examples of Technology Companies Leveraging Data**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Initiative / Service</th>
<th>Overview</th>
<th>Potential Data Sources</th>
<th>Predictive Analytics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td>Google NOW</td>
<td>Google NOW provides contextualized day cards on smartphones based on user google searches, email, location and other</td>
<td>![Customer location data] ![Customer searches] ![Email tags]</td>
<td>✓</td>
</tr>
<tr>
<td>Amazon</td>
<td>1-Day/Prime Shipping</td>
<td>Amazon a few years ago introduced 1-day/2-day shipping not only on items they sell themselves but also 3rd party re-sellers</td>
<td>![Customer order history] ![Ordering trends by location] ![Near real-time supplier/warehouse product inventory] ![Warehouse stock levels] ![Delivery service times by location]</td>
<td>✓</td>
</tr>
<tr>
<td>Uber</td>
<td>Car Service</td>
<td>Uber matches drivers to ride seekers in real-time optimizing for lowest pick-up time and highest rating</td>
<td>![Driver location] ![Customer location] ![Map data] ![Real-time traffic info]</td>
<td>✓</td>
</tr>
</tbody>
</table>

Each of these organizations strives to bring together various sources of data to solve real-business challenges.

Google, Amazon and Uber have all leveraged data (internal and external) to provide services and create opportunities that did not previously exist.
Communication Service Provider Data Sources

Communication service providers (CSP) such as telecommunications providers, multiple system operators (MSO), internet service providers (ISP) have access to vast amounts of data. CSP service/billing systems and customer premise equipment alone generate large quantities of data.

However most data at CSPs is generated, captured and maintained by various systems that are individual silos. Data within these silos is rarely consolidated and reconciled on an on-going basis to provide a holistic view of a CSP’s business.

Integration of data from CSP silos into a single analytical domain can provide CSPs a lot of valuable insight. These insights can not only have the potential to improve decision making and streamline business operations but also create new opportunities.

Once the appropriate infrastructure to consolidate data from various sources is in place, several external structured and unstructured sources of data can be combined with internal sources to provide more context and enable greater insight.

For CSPs consolidation of internal CSP data sources represents an important first step in unlocking potential from data.
Potential Opportunities for CSPs

Advanced analytics with Big Data that combine data from various sources can create substantial value for CSPs. The insights unlocked from Big Data analytics have wide ranging applications for CSPs enabling opportunities from improved network expansion and churn management to increased data monetization. While there are several areas within the industry that can benefit from Big Data analytics, CSPs should be careful to prioritize opportunities that provide the most benefit and can be implemented without impacting other ongoing projects and initiatives. Figure 4 below highlights a select few areas within the CSP domain that could benefit from the deployment of Big Data analytics.

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**Figure 4: Examples of Opportunities for CSPs**

<table>
<thead>
<tr>
<th>Area</th>
<th>Example Use Case</th>
<th>Key Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Expansion</td>
<td>CSPs can evaluate current network performance as well as utilization to identify future trends. Using this insight CSPs can make more educated infrastructure investment decisions.</td>
<td>![checkmark] Increase ROI for Network Investments ![checkmark] Improve Customer Sentiment</td>
</tr>
<tr>
<td>Sales and Marketing</td>
<td>A deeper analysis of current CSP customer base as well as target customer segments combined with data from other external sources can help a CSP improve sales targeting and improve messaging to the potential customers.</td>
<td>![checkmark] ![checkmark]</td>
</tr>
<tr>
<td>Product Management</td>
<td>Measuring consumer sentiment on social media related to a new product launch can provide product managers with actionable clues on potential adjustments.</td>
<td>![checkmark] ![checkmark] ![checkmark]</td>
</tr>
<tr>
<td>Data Monetization</td>
<td>CSP data could be layered with other external contextual data to increase the value of data to third parties or advertisers.</td>
<td>![checkmark]</td>
</tr>
<tr>
<td>Churn</td>
<td>Customer service and complaint data, competitive information from the field and customer sentiment data from social media can be combined to identify and retain high probability churn customers.</td>
<td>![checkmark] ![checkmark]</td>
</tr>
</tbody>
</table>
Key to Successful Execution

Firms adopting and implementing advanced analytical solutions face several challenges. These challenges in some sense are more pronounced for CSPs owing to the variety and complexity of CSP data sources and systems. Borrowing a few lessons from leading technology firms as well as some industry best practices, the following set of principles can significantly improve chances for success:

Leveraging domain knowledge: General and specific knowledge of the CSP industry (beyond organizational specific knowledge) is crucial to extracting insights and significance of data. This type of experience will ensure initiatives can deliver and demonstrate value back to the business from the outset.

Enabling access to appropriate external data sources: External data such as demographic, competitive and social data can greatly enhance the value of internal data when applied correctly.

Enabling access to resources with appropriate knowledge of internal data: Resources with local knowledge are needed to support the effective initiation of analytics solutions.

Maintaining data integrity and quality: Understanding and ensuring integrity of the data is essential to ensure that users trust the insights generated from the data. An effective analytics solution implementation requires that inputs and data sources are periodically revised, ensuring that the data is accurate each time a new data source is added is vital to ensuring the success of the implementation. Where there are known issues these should be clearly factored into any insight.

A managed approach to analytics and big data can not only help address CSP’s with big data implementation challenges but also deliver significant benefits. Managed analytics augments existing CSP resources with external specialist resources that are available on-demand.

Some benefits of a managed approach:

- Access to a global knowledge base, world class capabilities and skills
- Access to highly skilled and specialized resources not available internally
- Minimum implementation time and time to value
- Ability to expand/contract teams on demand, in sync with business requirements
- Enhanced flexibility and the ability to rapidly test new opportunity areas
- Access to experience of new markets and industry areas

Conclusion

CSPs can borrow lessons from leading technology companies to launch successful big data implementations. A successful advanced analytics implementation with Big Data can help CSPs make better business decisions, streamline costs and identify new opportunities. Being successful in Big Data is not just about technology but about actively applying rigorous analytical techniques along with sound business judgment to data. CSPs have access to a wealth of internal data that, when leveraged the right way, can provide significant insight. A managed approach to big data can help CSPs reduce implementation times, provide greater insight and manage costs.
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