We empower supply management professionals with profound discovery, powerful connection, and clear foresight.

Measure up. Move forward.

EMERGING PROCUREMENT TECHNOLOGY AND USE: Data Analytics and Cognitive Analytics

May 2017
CAPS RESEARCH

- Non-profit organization
- JV of ASU and ISM
- About 120 MNC’s as members
- Our contact point—CPOs
- Value proposition
  - Research
  - Benchmarking
  - Events
RESEARCHERS

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RESEARCH APPROACH

- Literature review including past CAPS reports
- Interviews involving 37 companies—both CAPS and non-CAPS members
- CAPS Research Critical Issues Exchange (CIE) event at IBM
OVERVIEW

• The new procurement imperative
• Let there be... data
• State of procurement analytics
• Procurement technology platforms and use
• Analytics transformation: A maturity model
• Building an analytics culture
• On the horizon...
Procurement is at an inflection point where the old “bag of tricks” no longer works. Opportunity for savings through leveraging of spend have been depleted?

Cognitive analytics represents the next wave of opportunity.

Supply chain innovation is on the horizon.

A new set of procurement tools enabled by analytical innovation is required!
POWERFUL DISRUPTIONS HAVE FUNDAMENTALLY CHANGED LONG-STANDING BUSINESS PRACTICES AND INTERACTIONS

<table>
<thead>
<tr>
<th>Disruption 1</th>
<th>A digitized ecosystem is crucial for business success</th>
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<tbody>
<tr>
<td></td>
<td>New business models</td>
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<tr>
<td></td>
<td>Digital ubiquity</td>
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<td>Digital ecosystem</td>
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<thead>
<tr>
<th>Disruption 2</th>
<th>The upsurge of big data and analytics technology has been rapid and radical</th>
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<tbody>
<tr>
<td></td>
<td>Analytics &amp; cognitive</td>
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<tr>
<td></td>
<td>Cloud</td>
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<td></td>
<td>Social</td>
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<td>The Internet of Things</td>
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<tr>
<th>Disruption 3</th>
<th>Organizations that deploy the right skills can leverage analytics to <em>know</em> instead of merely to <em>speculate</em></th>
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<tbody>
<tr>
<td></td>
<td>Traditional transactional data</td>
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<td></td>
<td>Contextual data</td>
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LET THERE BE...DATA

- One estimate: 90% of world’s data in past two years
- Structured and unstructured data
- Data analytics and cognitive analytics
- Cognitive as opposed to programmed computing
  - Understand
  - Reason
  - Learn
STATE OF PROCUREMENT ANALYTICS

**Note:** Review of 164 procurement software platforms

**Source:** CAPS Research, Nov 2016
TECHNOLOGY PLATFORMS AND USE

Count of Analytical Platforms and Products (Nov ‘16)

Most Important Capabilities

Drill-down
Using cognitive analysis
Real-time uploads of data
Customized reports
User experience
Visualization
Mobile access
Sentiment analysis

% of respondents listed these as "Top 3"
ANALYTICS TRANSFORMATION

<table>
<thead>
<tr>
<th>Current Common Practice</th>
<th>Current Best practice</th>
<th>Future Best Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational databases</td>
<td>External data</td>
<td>IoT, Machine-to-machine</td>
</tr>
<tr>
<td>Structured data</td>
<td>Unstructured data</td>
<td>Digital, AI, Cognitive, real-time</td>
</tr>
</tbody>
</table>

1. Data Governance – Ensuring the right volume, variety, veracity, and velocity of data
2. Spend Analytics – Ability to rapidly visualize spending patterns and predict future spending
3. Contract Management- Understanding current contractual obligations
4. Supply Market Intelligence & Risk – Market understanding and insight to support sourcing strategies, as well as alerts that monitor potential risks that lead to supply disruption

Note: New technologies are emerging that impact the procurement process and landscape, which must be monitored and integrated when commercially viable.
DATA GOVERNANCE LANDSCAPE

Current common practice

• Input master data “as is”
• Data in Excel spreadsheets
• Spend data resides in ERP systems
• Manual data cleansing and harmonization
• Procurement front end open to all users

Current best practice

• Cleansed master data using algorithms
• Data pulled from ERP, functional systems, or dedicated supply chain data sources
• Improved data quality but poor definition of data across supply chain
• Restricted input access to super users with dropdown menus

Future best practice (2 – 5 years)

• Master data cleansed through MBL and minimum human touch
• External B2B data integration with customers and suppliers
• IoT operational data and distributed computing data incorporated
• Big data structured in larger volumes
• Customized user interface with auto-population features
# SPEND MANAGEMENT LANDSCAPE

<table>
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<tr>
<th>Current common practice</th>
<th>Current best practice</th>
<th>Future best practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Historical</td>
<td>• Direct tie of procurement to financial metrics via aligned GL codes</td>
<td>• Cognitive capability creates visual maps based on user queries</td>
</tr>
<tr>
<td>• Batch processing</td>
<td>• Forecasted spend impact on annual budgets and profitability</td>
<td>• Leveraging big data to create insights</td>
</tr>
<tr>
<td>• Procurement focused</td>
<td>• Integration of contract data and supplier metrics</td>
<td>• Predictive analytics and scenario analysis</td>
</tr>
<tr>
<td>• Mostly internal transactional data sources</td>
<td>• Real-time spend analytics</td>
<td>• Customized user interface</td>
</tr>
<tr>
<td>• Static reporting monthly or quarterly</td>
<td>• Analysis of spend variance by buyer across different business units and sites</td>
<td>• Spend updated in real-time</td>
</tr>
<tr>
<td>• Part complexity reduction</td>
<td></td>
<td>• Analyzes buyer preferences and patterns</td>
</tr>
</tbody>
</table>
## CONTRACT MANAGEMENT LANDSCAPE

<table>
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<th>Current common practice</th>
<th>Current best practice</th>
<th>Future best practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Historical contracts database</td>
<td>• Contract pricing linked to P2P system for pricing, discounts, payment terms, etc.</td>
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</tr>
<tr>
<td>• Contracts searchable by supplier</td>
<td>• AI tools can guide purchasing through decision tree to direct to appropriate contract template</td>
<td>• Contracts linked to external market indices</td>
</tr>
<tr>
<td>• Static reporting monthly or quarterly</td>
<td>• Searches product “Best Practice” contracts</td>
<td>• Contract system generates alerts linked to external big data environmental triggers</td>
</tr>
<tr>
<td>• Contract templates available</td>
<td>• Contracts sorted by spend category</td>
<td>• External events (regulatory, currency) trigger contract renegotiation clauses</td>
</tr>
<tr>
<td>• Contracts sorted by spend category</td>
<td>• 100% spend under contract</td>
<td>• Contract renewal periods drive CM workflow</td>
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</table>
MARKET INTELLIGENCE LANDSCAPE

Current common practice

• Website scanning & trade journals
• Reading generic MI reports
• Monthly price index reviews
• Downloading public data
• Developed prior to contract renewals
• Tacit information in the heads of procurement SME’s

Current best practice

• Customized MI reporting by 3rd parties
• MI COE analysts develop reports on demand
• Standard pricing updates and market news on procurement portal
• MI keyword searches yield news feeds
• Linkages of supply and demand strategies
• Knowledge management systems

Future best practice

• Real-time pricing updates and futures triggers
• Predictive analytics linked to market events
• Scenario analysis support category strategies
• Analytics identify emerging technologies, market events, and multi-tier insights
• Historical MBL analysis capable of building predictive capabilities
• Linkage of supply-side and buy-side events align forecasting of shortages or surpluses

2-5 years
BUILDING AN ANALYTICS CULTURE

1. Develop a Data Management & Governance Discipline

2. Identify Target Areas for Analytics Pilot

3. Explore Application of Alternative Analytic Technologies

4. Establish Technology Roadmap for Adoption of Real-time Predictive Analytics

5. Pilot, Learn, and Repeat: Build an R&D Capability
A HIERARCHY OF ANALYTICS INSIGHT

Future
- Predictive Analytics
  Innovative data leveraging: Customized solutions that enable insights into business strategy problems

Real time
- Supplier Life Cycle Risk Analytics
  Contract database & workflow capture that drive continuous supplier improvement

Current
- Spend Analysis
  Contract Management Systems
  Historical spend history “point solutions” for capturing cost savings and productivity

Historical
- Basic ERP Systems
  (AP, MRP, GL, Boilerplate P2P)
  Data that provides insight into historical spending practices

Foundations
TALENT BLENDING FOR ANALYTICS

“Analytics Interpreter”
- Understanding of both statistics and category mgmt
- Natural Curiosity
- Relating systems to procurement outcomes

Deep Business / Category Knowledge
- Market Intelligence
- Technical Savvy
- Supplier Capabilities
- Price/cost analysis
- Tribal Knowledge

Deep Analytic Toolset
- Excel Master
- SAS DataMiner
- SAS JMP
- Tableau / Qlik
- SAP/Oracle Master Data
- Python/ SQL

Creating the right research team that brings together insight, tools, and inquisitiveness is fundamental to success...
ON THE HORIZON

• Internet of things
• Distributed computing
• Blockchain technology
• 3D printing
CAPS Research empowers supply chain professionals with profound discovery, powerful connection, and clear foresight. We create sales-free, bias-free strategic insight for top global organizations through research, benchmarking and member company networking. CAPS Research is jointly sponsored by Fortune 500 member companies, the W. P. Carey School of Business at Arizona State University, and the Institute for Supply Management® (ISM®).

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YOUR FEEDBACK IS IMPORTANT

Please take a few minutes to complete this brief survey.

Survey link: www.instituteforsupplymanagement.org/AD17
or Scan the QR code on your smartphone.