Session 3: The World of Big Data from the Evolving Digital World

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• PMSA Virtual University is conducting this four-part webinar series focused on the introduction and understanding of the current and evolving data resources available in the Life Sciences industry.

• Each session in this webinar series is designed to build on the prior session to both expand and explore the evolving data available to the Pharmaceutical industry:
  – **Session 1:** Learn about core pharmaceutical datasets - retail and non-retail.
  – **Session 2:** Dig deeper into analytics with APLD, EMR, and Specialty data.
  – **Session 3:** The world of big data coming from the evolving digital world.
  – **Session 4:** Understanding data behind the complex new world of healthcare involving IDNs and ACOs.

• With a solid foundation of data resources, PVU’s goal is to establish a venue for discussion and collaboration on best practices in analytics, marketing, and sales operations.
Agenda

• Big Data
• Pharma’s View – The Media Data Landscape
• The Online Data World
• Data Linkage and Analytics
• Q&A

Goal: Right Data + Right Analytics + Right Answer
In the prior sessions, we have focused on more traditional and broadly utilized resources.
Big Data is multi-structured, rapidly changing, and tends to be large, often necessitating new tools and processes for efficient management and analytics.

### Variety
- Structured and unstructured data of all types

### Velocity
- Real time, continuous, and streaming data

### Volume
- Very large data sets in the order of 100s of Terabytes to Petabytes

### Complexity
- Complexity of processing, analysis, and deriving insights

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**Traditional Approach**

**Structured & Repeatable Analysis**
- Business Users determine what question to ask
- IT structures the data to answer that question

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**Big Data Approach**

**Iterative & Exploratory Analysis**
- IT delivers a platform to enable creative discovery
- Business explores what questions could be asked

\[ H_0: \mu_f = \mu_m \]
\[ H_a: \mu_f \neq \mu_m \]
While there are differences between traditional data sources, similarities exist as well.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
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<tbody>
<tr>
<td>Available for patients, payers, and prescribers</td>
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<td>Much more pre-processing needed to get data ready for use</td>
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**Similarities**

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**Differences**

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Pharma’s View
The Media Landscape
Brave New Worlds
Today’s world of media: trends, consumption, and the creation of data galore
The world of media (and what media represents) is evolving at a rapid pace
Today’s media take various forms

- **PAID MEDIA**: Traditional advertising – print, television, radio, display, direct mail, paid search, retail/channel
- **OWNED MEDIA**: Corporate web site, campaign microsite, blog, brand community, Facebook fan page, mobile, etc.
- **EARNED MEDIA**: Word of mouth, Facebook comments, Twitter (@mentions, @replies), Vine, Blogs, forums, review sites

**General Consumers**

**Customers**

**Super Fans**
Media buying versus consumption

Because the media world is shifting so quickly, Pharma is not adapting their spending habits to where the consumers are spending their time.

And they are doing multiple things simultaneously.
The Online Data World
The Pharma industry has several eMarketing channels to engage customers, but no single data source to capture all activities.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Metrics</th>
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<tbody>
<tr>
<td>Email + E-samples</td>
<td>Sends, Opens, Click-throughs, and Orders (conversion)</td>
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<tr>
<td>Mobile Apps for Patient Education</td>
<td>Starts, Completes, Registrations, Secondary Engagements</td>
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<tr>
<td>Banner Ads</td>
<td>Impressions and Click-throughs</td>
</tr>
<tr>
<td>Website/Web Portal</td>
<td>Total Views, Unique Visitors, Engagement Level, Most-valued Action, Who is On</td>
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<tr>
<td>Search (SEM &amp; SEO)</td>
<td>Keywords Information, Views (Available in clickstream data)</td>
</tr>
<tr>
<td>Social Media/Networking</td>
<td>Posts, Unique Posters, Conversation Velocity &amp; Virality, Social Linkage, Social Influencers</td>
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The coordinated use of this data can help teams design more effective sales strategies and gain competitive advantage.

**Digital Data Management**
- Digital Data Collection & Tracking
- Digital Data Integration
- Data Cleaning & Validation
- Data Mart Creation
- Reporting & Dashboarding

**Behavior Analytics**
- Customer Activity tracking
- Navigation Pattern Analysis
- Anonymous User Profiling
- Segmentation
- Key Driver Identification
- Customer Relationship & Engagement

**Digital Channel ROI Analytics**
- Digital Channel Mix Optimization
- Quantification of the drivers of engagement and sales (Connect the Cookies)
- Forecasting & Regression Analysis for Digital Channel
- Program Input and Evaluation

**Other Digital Analytics Solutions**
- Social Media Analytics (Tracking, Listening, Behavior Analysis, Network Analysis)
- Digital Campaign Management (Targeting, Response Modeling, Execution)
- Search Engine Optimization

**Providers**
- Coremetrics
- Terradata
- Cognizant
- Accenture
- Epsilon
- ZS

- Coremetrics
- Omniture
- SAS
- Cognizant
- Accenture
- Epsilon
- ZS

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- MMA Synovate
- Cognizant
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- ZS

- Sysomos
- SAS
- Cognizant
- Accenture
- MMA Synovate
- Radian 6
What is “click-stream” data?

Definition: A record of what content is shown and where a user clicks on while web browsing or using another software application.

- Originally website & server based
- Then came “cookies” and “tagging”
- Track people over time
- ISP based
- Referring pages and search capture
- Geo-accuracy

Segmentation
Behavioral Analysis
Marketing Effectiveness
Site Optimization
Digital Measurement
The social data world adds complexity and changing velocity
You must be aware of social data restrictions

- All social media data is subject to Data Protection laws, meaning that it should only be obtained for a specific purpose and should not be kept for longer than is necessary.

- Organizations must find out whether there is any intellectual property contained within the data, and if so, whether it is subject to copyright or confidentiality regulations.

- Respect social networkers' privacy, even if their profiles are publicly visible.

- HIPAA restrictions.

- Examples of regulations and policies:
  - The Russian parliament has passed a law mandating that social networks and other similar services be required to warehouse data on citizens within Russia.
  - New Twitter policy around the deletion of tweets.
The world of “Wearables” brings the Internet of Things to Pharma

Wikipedia: Miniature, body-born electronic devices that are worn by a person under, with, or on top of clothing that collect and transmit data in real time.
The composite framework below provides the direction for a company to achieve desired outcomes from its digital marketing strategy.
Linkage and Analytics

The Future is Here: Case Studies
A solid understanding of data allows you to start to use digital and media data to complement your traditional approaches

- What frequency of non-personal touch points are optimal to increase prescribing behavior?
- What digital tactics best complement sales force activity?
- How do prescriber views on disease state influence their treatment decisions, and how can you tell when views are changing?

- What percentage of your potential scripts are being lost due to payer decisions?
- How to therapy pathways change by payer?
- What payers are moving your product up in the treatment cycle, and which ones are moving it down?

- How can you track a patient from being informed about your product to being a loyalist?
- What patient behaviors predict a change in therapy?
- What media channels are most effective in driving a patient to the prescriber?

The linkage of traditional data with media and online data can help you answer these and many other questions.
“Patient Pathing” Approach to Media Measurement

Transition in Approach

Old Approach: *Single Point of Insight*
Limited insights available at end of the study period, making them non-actionable

CAMPAIGN EXPOSURE
Ad Campaign, Website, Microsite

PATIENT Rx

New Model: “Patient Pathing”
More actionable, continuous receipt of patient data

+ AUDIENCE QUALITY
+ PHYSICIAN OFFICE VISIT & DIAGNOSIS
+ PATIENT Rx + ADMINISTRATIONS
+ PAYOR CONTROL
+ ADHERENCE TRACKING

Patient Pathing In Action

249,000 Consumers exposed to media intervention

87,000 were being treated in the category of interest

4,900 patients received or had the diagnosis of interest

5,800 patients went to the MD

3,500 patients received a prescription for Brand A

1,960 patients filled Rx for Brand A for the first time

280 patients got an Rx but didn’t go to the pharmacy (estimated)

300 patients’ Rxs were rejected by their payer

450 patients Rxs were substituted with a different brand or generic

510 patients abandoned Rx at the pharmacy

Barriers prevented 1,540 new patient starts for Brand A
“Patient Pathing” Approach to Media Measurement

**Case Study 1**

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Using Online Behavior to Recognize the Anonymous Visitor

We developed models based on the behavior of known physicians on the client brand’s professional site.

And applied the models to two other groups of physicians using the site.

We were able to predict with over 80% accuracy whether the visitor was a physician.

This allowed the customer to differentiate between a prescriber and a non-prescriber, thereby enabling them to tailor their content according to visitor type.
Questions?
With media and digital data, the language has changed

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<th>Electronic Health Records</th>
<th>The “Cloud”</th>
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<td>Agency</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>Impressions</td>
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