Predict and Adapt: How Machine Learning Can Optimize the Entire Customer Journey

The discussion will begin at 2:00 PM ET. You can listen to the video using computer speakers or headphones. Please submit any questions you have and we’ll do our best to address them during the Q&A session.

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Predict and Adapt: How Machine Learning Can Optimize the Entire Customer Journey

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Today’s Speakers

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Thank you for joining us.
CX

Segmentation

Journey Understanding

Optimization

Personalization

Next-best-Action

Customer Discovery
Just For You
Offer
When you act today

Become a VIP
Get a just-for-you offer after your first purchase

Sign Up Login

CX

Just For You
Offer — today only. Tap for details

Place Order

Relevance

Context

Cadence

Intent
ABC – Learning from Customer Behaviors

Antecedent

Behavior

Consequence
“If you have always done it that way, it is probably wrong”

- Charles Kettering
Machine Learning – Why

Three basic tenets for success in today’s world

• Prediction – you need to learn and use what you learn

• Optimization/Adaptation – the world is dynamic

• Automation – because people don't scale well
The World is Dynamic – Don’t Be Left Behind
Implementation

Strategy
High Impact ML

Integrated System Approach

• Data pre-processing, curation, filtering, accessibility, …

• Rapid Modeling – enable both marketing and data scientists

• Post-Processing

• Systemic Automation (ease of repeatability)
The value of Machine Learning in Improving Customer Experience
Predictive ML

Regression/Classification (Supervised learning)
• You have historical data and known correlated outputs (truth) (e.g., recent sales amounts, attrition/retention data)

Clustering/Segmentation (Unsupervised learning)
• Have historical data, but may not have (or trust) associated outputs (e.g., want to find demographic clusters, similar behaviors)
## Potential Business Use Cases

### Classification

<table>
<thead>
<tr>
<th>Business Problem</th>
<th>Output Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predict Customer Retention/Attrition</td>
<td>Retention Likelihood</td>
</tr>
<tr>
<td>Predict Best Message Channel</td>
<td>Best Available Channel</td>
</tr>
<tr>
<td>Predict Best Message Content</td>
<td>Best Available Message</td>
</tr>
<tr>
<td>Predict Likelihood to Rebook</td>
<td>Rebooking Activity</td>
</tr>
</tbody>
</table>

### Regression

<table>
<thead>
<tr>
<th>Business Problem</th>
<th>Output Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomaly Detection</td>
<td>Deviation from &quot;Normal&quot;</td>
</tr>
<tr>
<td>Predict Annual Spend</td>
<td>Predicted Spend</td>
</tr>
<tr>
<td>Predict Time To Next Purchase</td>
<td>Time Between Purchases</td>
</tr>
<tr>
<td>Predict Customer Sales</td>
<td>Sales ($ or Quantity)</td>
</tr>
</tbody>
</table>

### Clustering

<table>
<thead>
<tr>
<th>Business Problem</th>
<th>Output Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment Customer Behaviors</td>
<td>Behavior Cluster</td>
</tr>
<tr>
<td>Segment Customer Demographics</td>
<td>Demographic Cluster</td>
</tr>
</tbody>
</table>
Special Offer!

Your favorite model car
... now even better
Use Case – Customer Segmentation / Optimal Messaging

Use Data + ML Algorithms to find similarity groups When collecting data, think “stimulus-response”

• Minimize potentially erroneous assumptions

• Let the data **speak for itself**

• Raw data -> ML -> segments

• Biggest question – why are these records in a particular segment? (i.e., how can we use the results to gain marketing insight)
Chaining ML Techniques -> Data-Driven Insight

- Clustering/Segmentation labels the data
- ML Classification can extract the ‘why’
- Decision Trees to the rescue!
- Rules -> map offers/products to customers
ML Chaining→ Data-Driven Customer Messaging

Decision Criteria

10000 Samples

Marital Status?

- Married 61%
  - Age < 42
    - Shoes 57%
    - Shirt 43%
  - Age < 25
    - Jeans 82%
    - Hoodie 18%

- Single 35%
  - Age < 28
    - Jeans 36%
    - Shoes 64%

- Unknown 4%
  - Age < 28
    - Jeans 36%
    - Shoes 64%

Predict Best Response: Jeans, Shoes, Shirt, or Hoodie
Increase Success Rate - Post Processing ML Results

ML Product/Offer Recommendation

• Product/offer recommendation scores

• Utilize recent behavioral knowledge (expand consumer horizons)

• Purchase periodicity (durable goods vs. consumables)

• More Model chaining
  (targeted offers + channel/periodicity model)
Focus on Redpoint Automated Machine Learning
Adaptive Bootstrapping

Historical User Behavior (stimulus/response)

DB

Train / Update Model

Operation (Trigger)

Non-Adaptive (Fixed) Mode

Randomized A/B/C Offer Selection

Adaptive ML Mode

ML Prediction Offer Selection

Ad / Offer (stimulus)

Feedback Cycle (response)
CONTINUOUS
OPTIMIZATION
Managing a fleet of models
Tunable to business goals

MODEL BUILDING
DATA & GOALS AS INPUTS
Configurable models

MACHINE LEARNING
Evolutionary programming

MODEL DEPLOYMENT
In-line deployment

CONTINUOUS OPTIMIZATION
Managing a fleet of models
Tunable to business goals

MODEL TYPES AND PURPOSE
Segmentation Models | Predictive Models | Optimization Models
Staying Ahead of the Game

Adaptation is the Rule

• Model/Data currency - trends, seasonality, environmental changes
• Periodic model retraining / refreshing
• Feedback loops – track results and adapt to change
• Automation – big red easy button
Best Practices and the Future of AI and ML
Explainable AI

Today

- Training Data
- Machine Learning Process
- Learned Function

Decision or Recommendation

Task

User

- Why did you do that?
- Why not something else?
- When did you do succeed?
- When do you fail?
- When can I trust you?
- How do I correct an error?

XAI

- Training Data
- Machine Learning Process
- Explainable Model
- Explanation Interface

Task

User

- I understand why
- I understand why not
- I know when you succeed
- I know when you fail
- I know when to trust you
- I know why you erred
Inbound Data

Customer Data Management

REAL-TIME AGGREGATION LAYER

- High speed definition and roll-out simple maintenance
- Ephemeral & persistent data in-session calculations
- Supports real-time analytics and decisioning

REAL TIME IDENTITY LAYER

- Data Ingest
- Identity Resolution & Data Integration
- 360º View of the Customer
- Probabilistic and Heuristic Matching

OPERATIONAL PROFILE

- No Latency from Ingest to Activation
- Update Identity Graph in Real Time
- Update Historical Aggs in Real Time
- GDPR & CCPA Management

Inbound Data

STREAMING DATA

Soc Med

Event

Web

IoT

BATCH DATA

Product Registrations

eComm

Models

PoS

DMP

VoC

Redpoint

Golden Golden Record

IDENTITY GRAPH

ATTRIBUTES

AGGREGATIONS

PHYSICAL

ECOMM

DEVICE

SOCIAL

HOUSEHOLD

TRANSACTIONAL

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# AI Maturity Model

<table>
<thead>
<tr>
<th>Planning</th>
<th>Experimentation</th>
<th>Stabilization</th>
<th>Expansion</th>
<th>Transformation</th>
</tr>
</thead>
</table>
| - Early AI Interest  
- Pioneers explore techniques  
- First use cases  
- Define success criteria | - Data Scientists experiment  
- Successful POCs  
- First pilots  
- AI lab established | - Several uses cases in production  
- Budget is assigned  
- Mastery & standardization  
- AI Community or CoE | - Pervasive use with C-level ownership  
- Governance, Ethics, Risk management  
- Strategies and innovations | - Integrated process & disruptive models  
- Move to AI products  
- Augmented intelligence  
- Profound impact on people and culture |

- Select and prioritize AI use cases  
- Prove the business value of AI use cases  
- Stabilize infrastructure to access data and AI tools  
- Scale AI and expand data sources  
- Share your AI advantage with others

Source: Gartner Artificial Intelligence Maturity Model, 2020
Questions & Thank You

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Q&A Session
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