AYASDI

Denials Management Solution using Machine Intelligence
The Revenue Opportunity

Opportunity

High

Low

Scope of Analysis

Narrow

Broad

Individual Claim

Macro Level Summary

17%

28%

44%

11%
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The Denials Opportunity

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Company Confidential & Proprietary
Traditional Analytics Have Hit the Wall

Analysts  →  Hypotheses  →  Coding  →  Data  →  Insight

Weeks/Months/Years/Never
Complexity is the Challenge

# of possible insights in Dataset is exponential function of size

# of possible insights in the Dataset after it grows another 40%
The Solution is Machine Intelligence

Data → Automated Discovery → Insights → Decision Maker

Minutes
How It Works

- Apply algorithms to a data set
  - Statistical
  - Geometric
  - Machine learning
- Construct a multi-faceted notion of similarity
- Cluster similar data points
- Create similarity maps that reveal mid-level patterns
**Nodes** are groups of similar data points

**Edges** connect similar nodes
Surface Mid-Level Patterns of Denials

Discover distinct groups of similar claims that have high concentration of denials

Concentration of Denied Claims
Low  High
Uncover the unique attributes of each group to produce rich descriptions of denial patterns.
1. Identifies drivers of rejections and denials for groups of claims

2. Prioritizes & streamlines work queue for claims resubmission

3. Informs upstream process changes to prevent future denials
Despite years of effort, the provider continued to write off tens of millions of dollars annually.

Identified new patterns of denied claims. Identified specific drivers for known patterns of denials, suggesting new options for intervention.

Solution is projected to address 70% of denied dollars and will continue to identify new denials patterns as they arise.
Example of data used for analysis

Typical claim form

Data included:

- UB-04 hospital billing data
- Additional account data from provider’s financial databases
- Associated 835 remit transactions (denials, rejections, underpayments, payments)
- Primary payer data
- Personal or family guarantors
Denials Management Workflow

Provider Claims Data
Staging DB, Data Transforms
Generate Similarity Maps
Color by % of Denials
Investigate Hot Spots
Output Denials Hot Spot Report

Identify drivers of rejections
Drive process modifications
Reduce denials upstream
How It Works

• Use a multi-faceted notion of similarity to cluster similar data points

• Create similarity maps that reveal mid-level patterns
  
  • **Nodes** are groups of similar data points
  • **Edges** connect similar nodes
  • **Colors** let you see values of interest
  • **Position** of a node on the screen doesn’t matter
# Uncovering Characteristics of a Hotspot

**HOTSPOT ANALYSIS**

Dataset: `denials_100K_wide_150429.tsv`

Network Parameters: Prin DX Codes + HCPCS + Payor1

*Red = under-represented*

## Summary

<table>
<thead>
<tr>
<th>Hotspot</th>
<th>Claims</th>
<th>Volume</th>
<th>Percent</th>
<th>Amount</th>
<th>Volume</th>
<th>Percent</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Island A</td>
<td>2947</td>
<td>2590</td>
<td>87.89%</td>
<td>$2,602,381</td>
<td>158</td>
<td>5.36%</td>
<td>$34,357</td>
</tr>
</tbody>
</table>

## Top Payors

<table>
<thead>
<tr>
<th>Payor</th>
<th>% Rejected</th>
<th>Rejected</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYOR 1</td>
<td>89.11%</td>
<td>$2,318,982</td>
<td></td>
</tr>
<tr>
<td>PAYOR 2</td>
<td>1.97%</td>
<td>$51,267</td>
<td></td>
</tr>
<tr>
<td>PAYOR 3</td>
<td>1.39%</td>
<td>$36,173</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>92.47%</td>
<td>$2,406,422</td>
<td></td>
</tr>
</tbody>
</table>

## Top Providers

<table>
<thead>
<tr>
<th>Provider</th>
<th>% Rejected</th>
<th>Rejected</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic 1</td>
<td>45.13%</td>
<td>$1,174,455</td>
<td></td>
</tr>
<tr>
<td>Hospital 1</td>
<td>12.76%</td>
<td>$332,064</td>
<td></td>
</tr>
<tr>
<td>Hospital 2</td>
<td>10.72%</td>
<td>$278,975</td>
<td></td>
</tr>
<tr>
<td>Hospital 3</td>
<td>4.21%</td>
<td>$109,560</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72.82%</td>
<td>$1,895,054</td>
<td></td>
</tr>
</tbody>
</table>

## Revenue Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical/Surgical Supplies And Devices - Sterile Supply</td>
<td>98.47%</td>
</tr>
<tr>
<td>Pharmacy - Drugs With Detailed Coding</td>
<td>98.27%</td>
</tr>
<tr>
<td>Recovery Room - General</td>
<td>97.93%</td>
</tr>
<tr>
<td>Gastro-Intestinal Services - General</td>
<td>94.03%</td>
</tr>
<tr>
<td>Pharmacy - General</td>
<td>81.20%</td>
</tr>
<tr>
<td>Anesthesia - General</td>
<td>72.62%</td>
</tr>
<tr>
<td>Laboratory Pathological - Histology</td>
<td>36.41%</td>
</tr>
<tr>
<td>Medical/Surgical Supplies And Devices - General</td>
<td>32.10%</td>
</tr>
<tr>
<td>Anesthesia - Anesthesia Incident To Other Diagnostic Services</td>
<td>22.57%</td>
</tr>
<tr>
<td>Laboratory - Chemistry</td>
<td>18.49%</td>
</tr>
</tbody>
</table>

## HPCPS Description

<table>
<thead>
<tr>
<th>Code</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal saline solution infus</td>
<td>J7040 54.22%</td>
</tr>
<tr>
<td>Tissue exam by pathologist</td>
<td>88305 36.34%</td>
</tr>
<tr>
<td>Colonoscopy and biopsy</td>
<td>45380 26.87%</td>
</tr>
<tr>
<td>Colonoscopy w/lesion removal</td>
<td>45385 22.87%</td>
</tr>
<tr>
<td>Colon ca scrn not hi risk ind</td>
<td>G0121 22.63%</td>
</tr>
<tr>
<td>Colorectal scrn; hi risk ind</td>
<td>G0105 17.92%</td>
</tr>
<tr>
<td>Colonoscopy w/lesion removal</td>
<td>45384 11.03%</td>
</tr>
</tbody>
</table>
1. Identifies drivers of rejections and denials for groups of claims
2. Prioritizes & streamlines work queue for claims resubmission
3. Informs upstream process changes to prevent future denials
Facilitating the ICD-10 Transition

Understand the Long Tail

Infer New Rules as they Arise

Automated & Adaptive

Code Agnostic
The challenge of denials management is complexity – the low-hanging fruit is gone.

Using Machine Intelligence, providers can find actionable patterns of denials.

This presentation and other docs in Handouts.

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