IMAGE RECOGNITION FOR SHELF AUDIT
Analysts reckon that American retailers may now rake in $18 billion or more in rebates each year (data: The Economist, Buying up the shelves, 2015) up from $1 billion in the 1990s. Industry insiders joke that supermarket shelves are now the world’s most expensive property. The more expensive the product representation on a shelf is, the more attention Retailer/Manufacturer is ready to pay in order to optimize costs for managing shelf space. Unfortunately, nowadays shelf audit is often carried out in manual way.

So, where is the problem? Let’s illustrate how the process of manual data collection in a store usually looks like:

Sales representative manually audits the shelf and notes down the info.

Information is manually uploaded into the database. Due to huge work load and human factor the data may be inaccurate.

Data evaluation is performed – again, manually.

Too much time is spent for data analysis and decision making; decisions are made based on predeterminedly inaccurate information.

As a result, Retailer/Manufacturer is not meeting customer needs, falls behind competition and loses revenue.
ShelfMatch™, a fully automated SKU recognition system, significantly increases amount of data that can be collected by a sales representative, enhances analysis accuracy and notably reduces time expenditure needed for processing and analyzing the results. Here is how ShelfMatch™ works:

1. Sales representative of a Customer takes a snapshot of a shelf with a mobile gadget (smartphone/tablet).

2. The snapshot is sent to your servers with pre-installed ShelfMatch™ system and analyzed by the trained algorithms. SKUs on the shelf are automatically processed, detected and recognized.

3. Customer gets an automated report with accurate and detailed information on:
   - SKU presence/absence,
   - shelf share,
   - competitors’ products,
   etc.
Recogntion accuracy 97+%

Unique and patented SKU detection and recognition technology

Self-training algorithms (system can be trained to recognize new types of packaged goods)

SKU recognition based on various parameters (logo, color, form, package type, etc.)

API compatible with different external systems (CRM / SFA / FFM)

Real-time results (within 10 minutes / during the same visit)

Mobile SDK (out-of-the-box)

Data protection within private cloud
Apart from image recognition, **ShelfMatch™** includes presentation and calculation of following KPIs:

<table>
<thead>
<tr>
<th>KPI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Distribution</td>
<td>Also includes <em>Product Not in Distribution</em> reporting</td>
</tr>
<tr>
<td>OOS (out-of-stock)</td>
<td>Answers the question, whether the product is physically available in a given store, or not</td>
</tr>
<tr>
<td>Planogram compliance</td>
<td>Compares the agreed planogram to the active planogram (realogram) in the given store</td>
</tr>
<tr>
<td>Facing share, %</td>
<td>Calculates share of the total facings; Competitor’s share of the total facings</td>
</tr>
<tr>
<td>Assortment share, %</td>
<td>Calculates share of the total facings in the given store</td>
</tr>
</tbody>
</table>

The tool can also include the functionality of ‘open questions’ with a radio button and drop down answer menu, which an be easily administered on the Customer’s side.
HOW SHELFMATCH™ IMPROVES YOUR BUSINESS

**ACCURACY OF MERCHANDISING VISIT RESULTS**
At a 97%+ accuracy, the system provides accurate and relevant information on shelf performance.

**MAKE RIGHT DECISIONS BASED ON PRECISE INFORMATION**
Get accurate and objective in-store data that will help you set the standards in your annual negotiation agreements with suppliers.

**EVALUATE YOUR STORE PERFORMANCE AT ONE GLIMPSE**
Get immediate alerts on store performance (distribution, shelf share, OOS, pricing, planogram compliance and more).

**PRODUCT ROTATION INCREASE**
Automated shelf control enables to immediately detect OOS and take necessary actions.

**COST REDUCTION ON WAGE COSTS & PROMOTIONAL ACTIVITIES**
Reduce costs for payroll budgets for staff performing manual shelf audit up to 2-10 times.
**ShelfMatch™** is based on the Convolutional Neural Networks (CNN) technology that can be trained to detect and recognize almost any type of packages goods. The system has already been trained on cigarette packages, detergent powders, concentrated rinses, n/alcoholic and alcoholic drinks (canned and bottled), olive oil and olives.

To train the system (make it recognize a new SKU), around **100-200 images** of product shelves **per 1 SKU** are needed.

**Requirements to the images:**

- Good picture quality. Resolution not less than 420 pixels.
- Close-up shooting (not more than 3 meters far from the shelf). Products on the image need to be easily distinguished with a human eye.
- Shooting from in front.

**How CNN is trained to recognize new SKUs:**

1. Customer prepares a database of 100-200 images per 1 SKU;
2. Kuznech marks up the SKUs on all images (the area with a logo and all concomitant elements);
3. Marked up images are uploaded into the CNN to get trained (the training time is about 12-20 hrs);
4. The system is tested and re-trained (if needed);
5. The system can be simultaneously trained on several SKUs.
SHELFMATCH™:
LET’S SEE HOW IT WORKS
SHELFMATCH™: LET’S SEE HOW IT WORKS

SKU: Baltika 7 (bottle)
**SHELFMATCH™: REPORT EXAMPLE**

**Ошибка в реалограмме всего: 6**

<table>
<thead>
<tr>
<th></th>
<th>Полка 1: 3</th>
<th>Полка 2: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Г. 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>В: 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Полка 1</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
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<tr>
<td>Полка 2</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
</tr>
</tbody>
</table>

- Несоответствие планограмме: посторонний товар
- Продукт не распознан/не знаком системе

### Таблица

<table>
<thead>
<tr>
<th>Название товара</th>
<th>Артикул</th>
<th>Полка 1 (Реалограмма/Планограмма)</th>
<th>Полка 2 (Реалограмма/Планограмма)</th>
<th>% соблюдения планограммы</th>
</tr>
</thead>
<tbody>
<tr>
<td>БАЛТИКА 3 0,5L (ЖЕСТ.БАНКА)</td>
<td>000114952</td>
<td>2/5</td>
<td>0/0</td>
<td>40%</td>
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<tr>
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<td>000114950</td>
<td>2/0</td>
<td>0/0</td>
<td></td>
</tr>
<tr>
<td>Неказисто</td>
<td>1/0</td>
<td>2/0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>БАЛТИКА 9 0,5L (ЖЕСТ.БАНКА)</td>
<td>000114957</td>
<td>0/0</td>
<td>2/5</td>
<td></td>
</tr>
<tr>
<td>БАЛТИКА 7 0,5L (ЖЕСТ.БАНКА)</td>
<td>000114955</td>
<td>0/0</td>
<td>1/0</td>
<td></td>
</tr>
</tbody>
</table>
In contrast to business models existing on the market, Kuznech offers its products on an annual license basis (unlike a widespread CPA model). This eliminates all restrictions on the number of requests for the Customer: you can use the system limitless within your organization.

License fee implies:

- Neural network, trained on 1 or several SKUs + all implementation instructions.
- Up to 20 hours technical support/month
- Instructions on how to train neural network on new SKUs: you can train **ShelfMatch™** on your side to recognize new products and add them to the system.
CONTACT US!

SHELFMATCH.COM
WELCOME@SHELFMATCH.COM