Infor Dynamic Science Labs

Product Visibility Analysis Helps Distributors Optimize Prices

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The Distributor Pricing Challenge

Distributors are **business-to-business** service providers that purchase products from suppliers and resell those products to customers.

A distributor may resell **500,000+** products to 5,000-10,000 customers.

To optimize its margins, the distributor must **carefully consider** the price of each product, and tailor this to the individual customers.

This **creates a huge price matrix** of *products x customers*, which is hard to optimize and manage.

How can a distributer effectively and efficiently manage his Price Matrix?

The Margin Matrix

Consider that each product has a fixed cost price, and the selling price is determined by adding a margin as follows:

Selling price = cost price * (1 + margin% / 100)

The margin% must be defined for each product-customer combination.

This defines the (also huge) Margin Matrix.

Alternative models determine a selling price by subtracting a discount from a (published) list price.

Also the discount% must be defined per product and customer, leading to a Discount Matrix.

The ideas in this presentation should also be applicable to such Discount Matrices.

Compacting the Margin Matrix

By creating groups of customers that deserve to pay the same margin, and groups of products that can be priced with the same margin, the distributor only needs to maintain a much smaller margin matrix of *product groups x customer groups*.

Customer groups can be based on indicators like sales volume, loyalty, profitability, etc.

The group of loyal and profitable customers with high sales volume are the most important customers - margins should not be too high.

But customers with low loyalty and low sales volume can be charged a higher margin.

Clustering algorithms (k-means, hierarchical clustering) can automatically group customers with similar indicator values.

But how can he create groups of products that can have the same margin?

Price Elasticity cannot be used

Price Elasticity models

try to measure the impact of a price change on the demand for a product.

Such models assume that the price of a product drives the quantity sold.

It Is hard to measure Price Elasticity

for distributors, because their prices are very stable.

Distributers only change prices by small amounts, and very infrequently (once per year or less).

Distributors operate in a business-to-business environment

If a customer is buying a large quantity, they often negotiate for a lower price.

So we see that the quantity can drive the price, which contradicts the assumptions of Price Elasticity models.

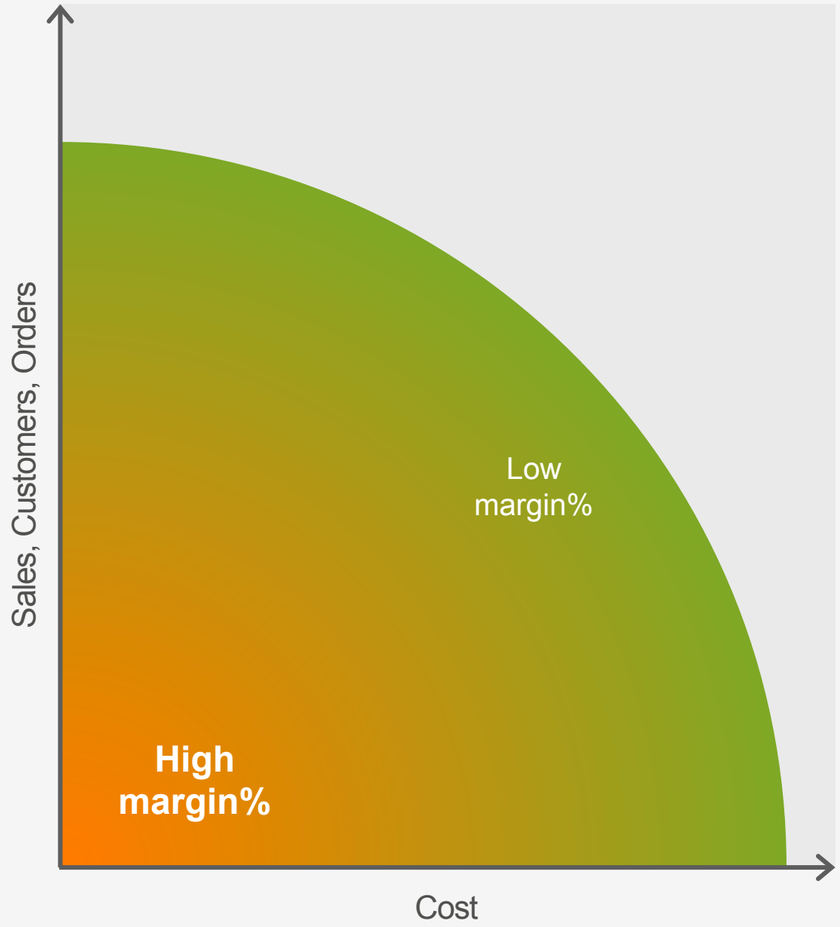
Product Visibility

Using data of the last year or quarter, for each product, it is possible to measure:

- Total sales amount
- Number of different customers that purchased the product
- The number of sales orders that contained the product
- The unit cost or unit price

Products with high values for these measures are considered to have *high visibility*. Customers care about these products a lot, and will generally not accept higher margins.

Products with low values on these measures have *low visibility*. For such products, higher margins are likely to be acceptable.



Product Visibility Score

The **Product Visibility Score** combines the visibility measures (Total Sales, Customer Count, Order Count, and Unit Cost or Unit Price) into a single number

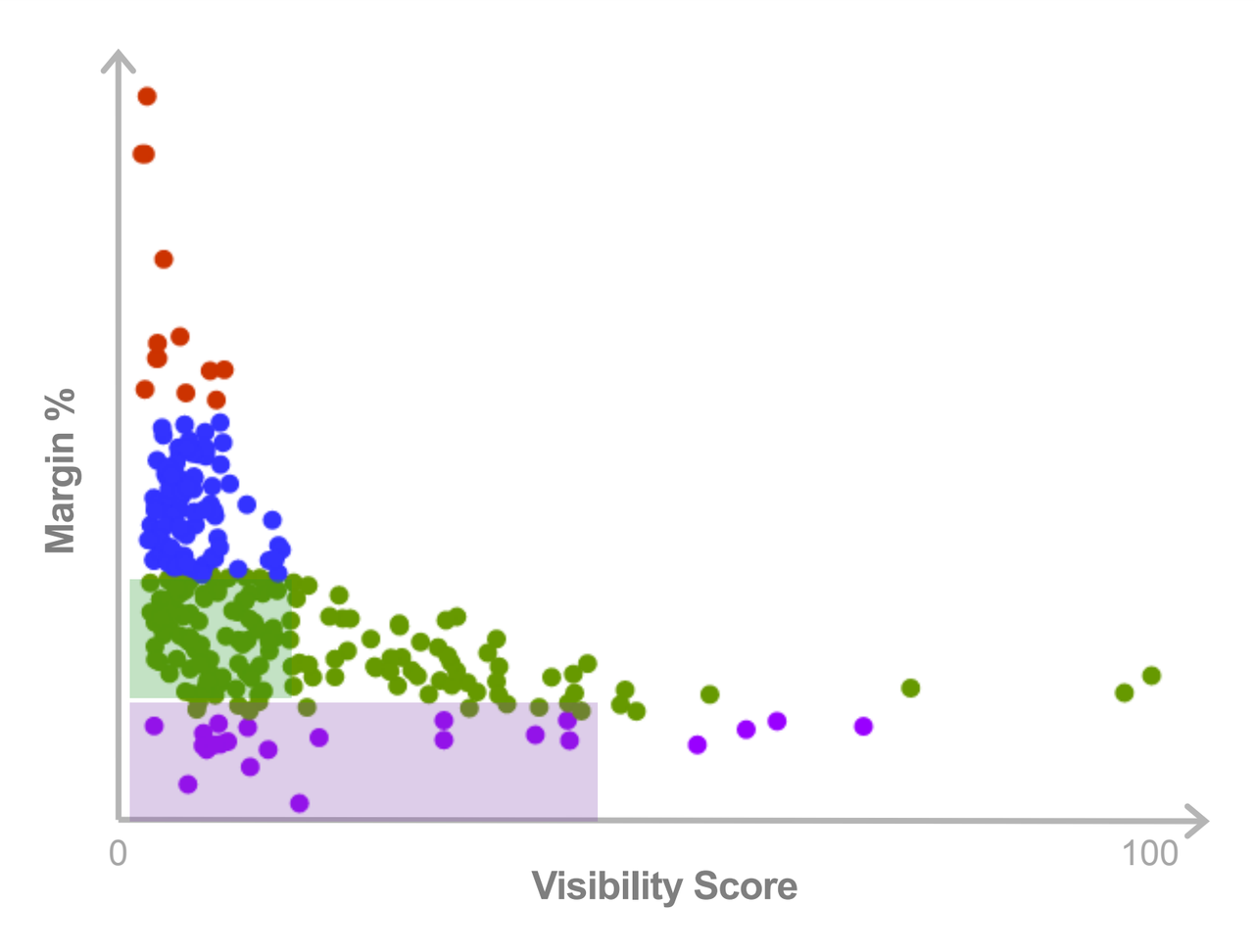
1. Transform the visibility measures to fit a standard normal distribution
2. Calculate a weighted combination of the transformed visibility measures
3. Scale the values to be in the range 0 – 100

The score can be calculated per customer, or group of customers, to tailor its value to specific market segments

Within a group of *functionally comparable products*, the products with the higher visibility scores should be priced using lower margins

By analyzing the visibility score and margin% within such a product group, we can identify products for which margins may need to be reconsidered

Margin Opportunity Analysis



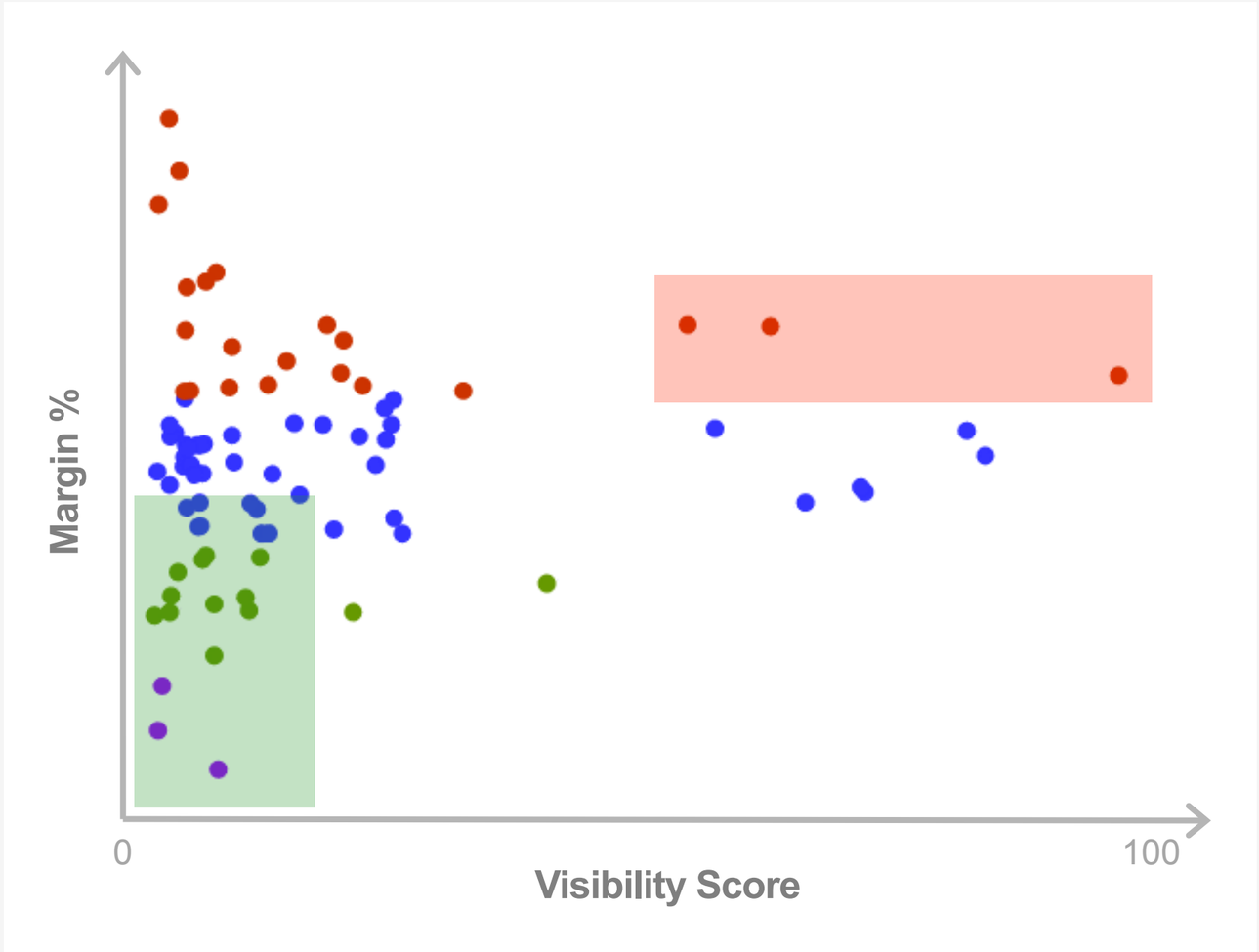
Here, a group of functionally comparable products is represented by dots. Each product is colored based on margin: red means margin % > 50%, and purple indicates the lowest margins.

The purple shaded area contains products of low to medium visibility. But the product group contains products with similar visibility and (much) higher margin%.

The green shaded area contains products with low visibility, but still a relatively low margin. The blue and red products have similar visibility but (much) higher margin%.

The products in these shaded areas are candidates for margin increase.

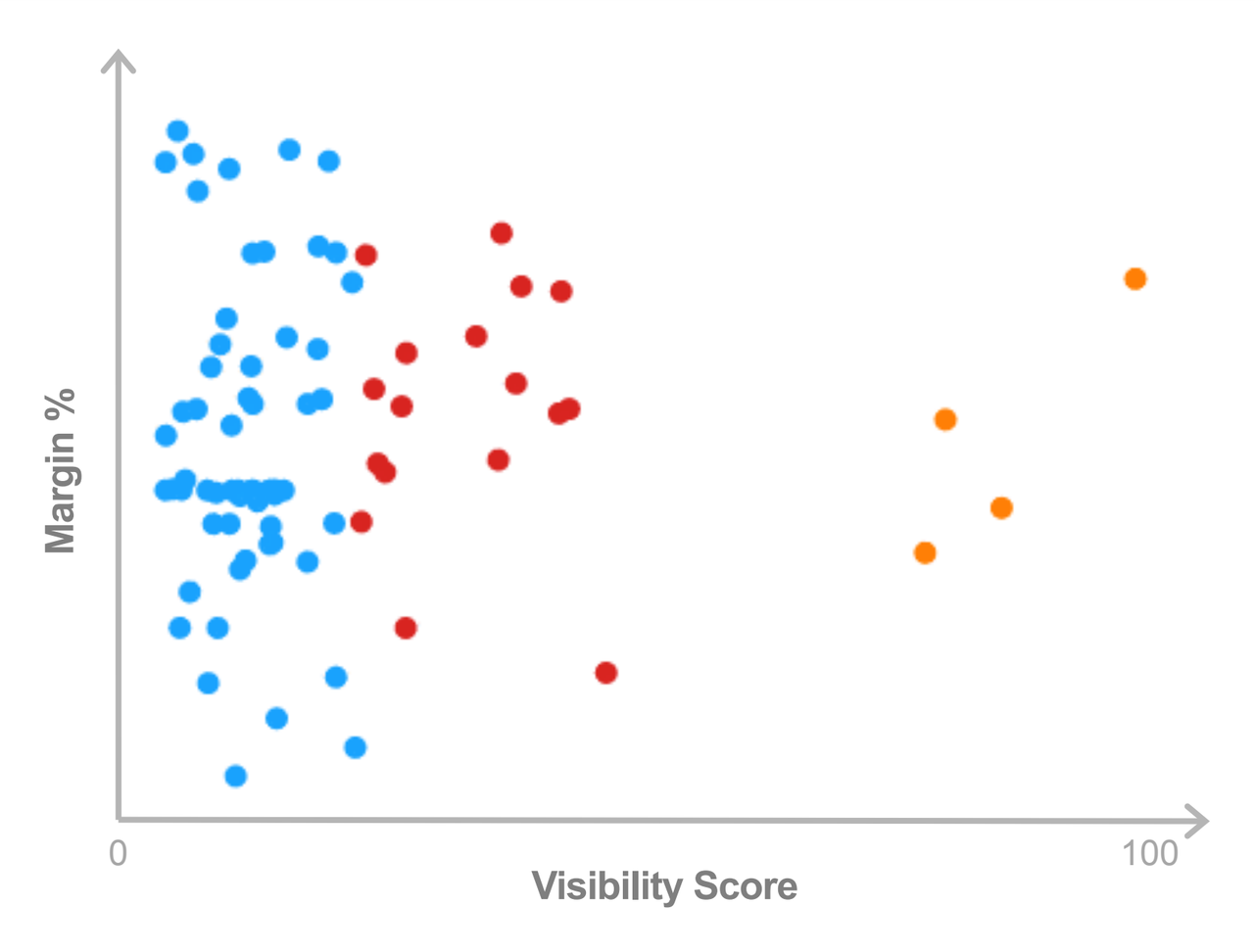
Margin Risk Analysis



Like in the previous example, **the green shaded area** contains candidates for margin increase.

But, **the red shaded area** contains products that may be priced too high. These are very visible, and have a rather high margin%. Is the distributor alienating customers with these products? Perhaps it is wise to consider decreasing these margins a little?

Visibility-based Product Clustering



Clustering algorithms can segment a group of functionally comparable products into sub groups based on the visibility score.

Each sub group can be priced using the same margin%, and hence become one row in the Margin Matrix.

The example shows three sub groups, suggesting that the product group will be represented by three rows in the Margin Matrix.

The number of sub groups can be chosen by the distributor or be optimized using one of the many clustering indices that have been published in the data science literature.

Defining and using the Margin Matrix

- Each entry in the **Margin Matrix** defines a target margin% for the associated customer group and product sub group
- This target margin% can be derived from the realized margins for the associated customer group and product sub group
  - It is beyond the scope of this publication to describe details of determining the target margin%
- The target margins must be applied with care
  - If a certain product is currently priced too low, you may want to gradually move its price to the desired price, e.g. through quarterly updates
- Note that high visible products will be more sensitive to price changes
  - Such products should be moved to their target price at a much slower rate than less visible products

About this publication

- This publication is based on work done by **Infor Dynamic Science Labs**
- At **Infor Dynamic Science Labs**, we work with Infor customers and product managers to identify industry-wide challenges and then solve these using elegant but understandable scientific methods
- For example, we are improving inventory availability and staffing allocations for hospitals and manufacturers, enhancing assortments for retailers, helping call centers improve their conversion rates, etc.
- If you are interested in learning more about predictive analytics in your Infor solution, or collaborating with us on a future project, please contact your Infor representative, or email us at science.labs@infor.com

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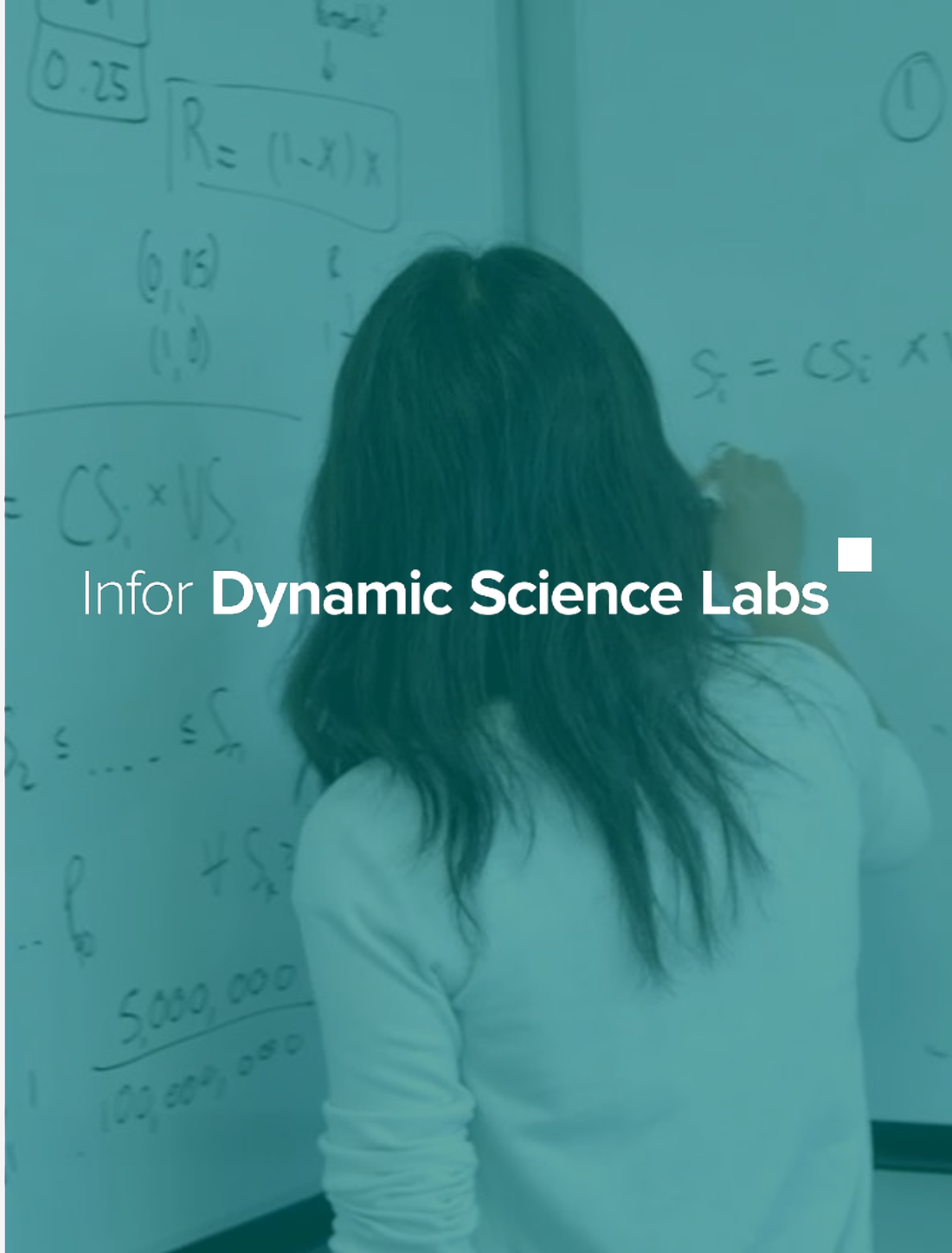


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