Price Setting: Improve spot price target achievement with real-time market/cost/value pricing models

As a Pricing Analyst / Manager, I sometimes have to use spot-pricing with customers who either:

- do NOT have a long-term pricing agreement (e.g., smaller customers or companies who do not need to guarantee supply)
  or
- do have an agreement but are purchasing outside of their contract (e.g., buying products not covered by a contract / buying quantities above their negotiated volume).

Spot customers negotiate a short-term (e.g., monthly / quarterly) price and quantity schedule based on a "spot-price." This business is planned out using an annual operating plan (AOP). Financial forecasts are created based on selling at defined volume / price / cost (margin) assumptions. Periodic price changes occur during the year based on market conditions (cost changes), market demand (supply vs. demand vs. alternatives), and other factors.
As changes in business conditions create a gap between expected and project earnings performance, as a Pricing Analyst / Manager, I must evaluate and implement pricing actions per

- portfolio
- geography
- customer segment
- competitive status
  So performance meets or exceeds financial targets.

Functional Requirements

Complication:

- Spot price changes occur frequently (daily/weekly/monthly) per market segment.
- 3rd party reference data needs to be updated frequently (daily/weekly/monthly)
- Calculating and communicating updated pricing is time-consuming and error prone.
- Notification requirements and price protection rules are complex and time-consuming.
- Evaluating potential impact to price actions is complicated and requires scenario tools.

Capability Needed:

- Flexible spot pricing interface accounting for margin by product, market, and geography
- Real-time pricing updates based on new input triggers and recalculation logic.
- Connection to 3rd party market, cost, and cost-to-serve data.
- Impact modeling based on updated data, forecasts, and other scenario modeling.
- Connection to ERP or other system to publish/execute updated customer contract pricing.

Benefit:

- Increase margin due to more frequent and faster spot price updates.
- Increased margin with decision support, simulation, and profitability forecast modeling.
- Reduced margin compression with reduction in manual errors and timely pricing updates

KPI:

- Higher margin improvement and price realization due to more frequent price changes

- Margin improvement due to more effective targeting of mass price changes

Core requirements

- Spot pricing can be managed in several different ways:
    - Explicitly set pricing – when the spot pricing is created, the pricer sets a price for the product. Unless all price adjustments are manually maintained or pricing expires in a set period, there would need to be some formula or approach for how the spot prices would change over time. In this case, the initial price would need to be provided by a user and would then would be managed by pricers in this use case. Negotiated prices might fit into this category.
    - Formula-based pricing – the prices might be set based on raw material or/and index based factors – either market or cost based calculations. This is likely the more common approach, but would need these formulas, formula components and formula calculations defined in order to make it work. If this is the desired functionality, the concepts from use case 1 should be used here to define and manage formulas. This use case would handle the ongoing management of the prices based on those formulas. This would include more list-like pricing, but could also include negotiated pricing with a cost plus or market index adder, similar to use case 1.
- Spot pricing can be maintained at various levels:
    - Spot prices can be set for any individual product (sku) in the product master.
    - Spot prices will generally have at least one other dimension:
        - Customer attribute or grouping (not individual customer level)
        - Region or geography
        - Business unit / distribution channel
        - Some other grouping factor
    - Spot pricing will almost certainly need to have several prices per product on the basis of the additional granularity factors above. However, prices should be mutually exclusive (only one price can apply to a given situation) or have a distinct hierarchy to define which price should be selected (based on the attributes) when there are conflicts.
- Spot pricing will need the ability to manage and adjust prices along defined approaches.
    - Pricing should be separated by key segments or categories (product attributes, customer attributes, regions, etc.) that are maintained and adjusted together.
    - Prices should be stored and visible in a price setting object that allows users to make mass adjustments to these prices.
    - Mass price changes should be able to be made along various attributes of the product, customer group, region or other factor. This should be defined by the key pricing factors of the customer.
    - Mass price changes should include being able to add an (currency) amount or percentage to a price as a part of an individual product or mass price change. The price should be adjusted by this amount and be held for approval.
    - Additional price change approaches (outside amount / percentage changes) can be possible, but would require specific requirements.
- When prices are anchored to costs or market indices (or other time-bound factors), it should be possible to automated price changes.

    - Automated price changes must have a basis in factors that are updated on some time interval or be tied to regular price changes (i.e. - +5% every year, etc.)
    - Automated price changes should adhere to a schedule, set at the same levels (defined above) that the prices will be managed, that dictate when new price factors should be picked up and the price recalculated.
    - The price changes should trigger in the designated time windows and recalculate prices and make them available for approval.
- A user should be able to make a product (individual sku) level price change as a direct override – entering a new price for the product – a manual override of the price.
- Price protection agreements should be able to be set up along the same levels (defined above) as price are managed (i.e. – customer groupings, distribution channels, etc.). These agreements should prevent prices from changing until the specified agreement date has completed.
    - Price protection agreements can be set up only at the same level as the prices are created. An agreement with an individual customer can't be managed if the agreement is at a customer group level.
    - The price protection should allow a user to set a date for the validity and immutability of the price – meaning regardless of any changes, that set of prices cannot change until that date has passed.
    - Any changes that also cover the protected price(s) should not take effect until the protection agreement's expiration date. At that point, they should be made available for approval.

Non-Functional Requirements

Reporting and Dashboards

Measures, Calculation and Decision-Making Key Performance Indicators

Reference for the demofx implementation: https://pricefx.atlassian.net/browse/PFNC-497

Useful metrics might include:

- **Result Price - Floor Price**
  = result price chemicals + Floor adjustment
  = (Base price + warehousing costs + packaging cost) + Strategy selection + Market area adjustment + Floor adjustment

- **Margin - Floor Price**
  = "Result Price - Floor Price" - Total Variable Costs
  = "Result Price - Floor Price" - (Base price + warehousing costs + packaging cost)
- **Result Price - Target Price** = (Base price + warehousing costs + packaging cost) + Strategy selection + Market area adjustment + Target adjustment

- **Margin - Target Price**
  = "Result Price - Target Price" - Total Variable Costs
- **Result Price - Stretch Price** = (Base price + warehousing costs + packaging cost) + Strategy selection + Market area adjustment + Stretch adjustment
- **Margin - Stretch Price**
  = "Result Price - Stretch Price" - Total Variable Costs
- **Result Price** = (Base price + warehousing costs + packaging cost) + Strategy selection
- **Margin** = Result Price - Total Variable Costs
- **Change in Price** = Result price this month - Result price previous month
- **Change in Price (%)** = ((Result price this month - Result price previous month) / Result price previous month) x100

8. We also need to define a PP tables for each additional factor that will be included in a price calculation.

Solution Design

Core to this use case is the concept that there is no established pricing agreement in place for the prices that are being managed. Essentially the pricing for these scenarios is not covered by contracts or other existing deals, and pricing may be based on a formula (and must be to allow automated price changes) or may not be and may be set based on some arbitrary concepts.

Prices will be managed using live price grids or price lists, depending on the granularity of the pricing action that will be used and how pricing is managed. For purposes of this design, we're assuming that live price grids (LPGs) will be used.

LPG orientation

The LPGs used for this use case can be set up with any structure. LPG orientation essentially ask what business scenarios will have their own LPG and which will be consolidated into LPGs together. The goal here is to fragment groups of pricing so that the prices are as easy as possible to maintain without creating too many disparate objects – which increase the operational burden. Having many LPGs makes prices easier to maintain in smaller groups, but requires far more objects to be created and managed, increasing work and creating opportunities for human error (i.e. – multiple items for a single generated price).

A "business scenario" in this definition is simply a set of prices that are maintained. Those prices will of course by for products, but the prices themselves may apply only for a certain product group, customer group, region or some other dimension that makes prices unique within an organization. This is a key question to establish with the customer – along what dimensions are your prices set?

The key questions to ask when determining LPG orientation are:

1. Who (and how) will manage the prices for each business scenario? Are certain pricing analysts responsible for certain product groupings or regions? Does a single cohesive team manage *all* pricing? Are different customer groups represented by specific teams?

2. What prices tend to change or move at the same time or in the same situations? Examples of this might be prices that are region-specific and have their own differing pricing cycle or prices for products that are all keyed on the same raw material prices.
3. <TBD>

There is no "perfect formula" for LPG orientation, but the focus should be to make operational processes for viewing, maintaining and managing prices as simple and intuitive as possible. Generally speaking, fewer LPGs will be easier to manage, so finding ways to fragment along clearly defined lines while keeping the total number of LPGs to a minimum is generally beneficial. Also keep in mind that managing LPGs larger than around 1 million prices gets cumbersome and slow. Generally < 100k items per LPG is optimal, but there are exceptions to every rule.

LPG Calculations

Once the LPG orientation (or often before) has been decided, the LPG logic can be created. The calculations may vary depending on the way calculations are structured – BOM or no BOM. The concepts below have the potential for variation, so the base case scenarios are defined below, or at least the high level structure. The items below are general additional details – and at least pieces of the design – though they may not be present on every implementation.

- (Dependent on customer requirements) Depending on the approach for spot pricing (see requirements), a pricing BOM may be required. Additionally, costs / amounts for the components of the BOM will be required. This is only needed if prices will need to be calculated off of the BOMs for automated changes or any other calculations. BOMs can have a number of structures, but should largely follow a component / percentage format (specifying a component – either raw material or market index – the percentage of the price calculations that component should contribute) for our "base case" set up.
    - In addition to the BOM table, there will also need to be a component costs / prices table(s). This should show the component, a price and validity dates when those costs are valid.
    - BOM calculations should be defined by the customer and accounted for in the pricing calculations.
- Parameter tables will need to be defined for the mass update calculations. These should be based on the pricing levels defined in the requirements and use those, in a single table or several (for hierarchical set ups). The calculations should be simple and additive unless the customer has significantly different requirements, the base case should always be straightforward additive calculations.

The calculations in the LPG can then take two forms – BOM calculations (price adjustments based on changes to the underlying raw materials or indices) or mass updates (price changes based on the parameter calculation factors). The specifics of the calculations for BOMs will largely be dictated by the customer, but should generally follow this pattern:

Component	Validity	Value	BOM Percent

			(From BOM table)
Component A	Current	$100	60%
Component B	Current	$200	15%
Component C	Current	$150	25%

In this scenario, the current price would be (100*0.6) + (200*0.15) + (150*0.25) = $127.50

Price calculations can be set up within the LPG logic if there's only one calculation method (likely with BOM pricing), but can also be set up using the Custom Actions capability if there are more than one operation. If Custom Actions are used, Parameter tables may not be necessary for the mass changes as the parameters for the change can be entered directly into the action execution in the LPG Mass Actions menu. Depending on the orientation of the LPGs, there may be multiple prices per sku in a given LPG using the matrix logic option.

LPG calculations may also have additional factors, even if a BOM calculation is used. In this case, the proper values will need to be looked up from one or more tables and included in the calculation. These values may also need to be displayed in the LPG. These adders may be cost-to-serve items like packaging and freight, target margins or other additional pricing factors.

Price Protection

- Price protection agreements may be represented in many different ways, but for the base use case in spot pricing, these should be set up in a Parameter table. These tables can be constructed in the same way that the mass price change tables are (using the pricing level dimensions) and should include validity dates for the invalid price change period.
- The price protections (only valid ones that apply to the LPG being calculated) should be looked up and stored during price calculation. If a protection period is in effect for the product / price the calculation should be skipped and no action should be taken.
- Users may find a notification or warning indicator to be useful to indicate that a price was not changed due to price protection.

Spot Pricing Dashboard

TBD

Input Data

In detail:
https://pricefx.atlassian.net/wiki/spaces/PSP/pages/2988998663/Chemicals+LPG+Align+prices+with+volatiles+raw+material+indexes

LPG fields	Calculation logics	Data Source
Product ID		Product master data
Product Name		Product master data
Market Area		Secondary Key for the LPG
Business Unit		Product master data
Product Group		Product master data
Packaging Type		Product master data
Cost per ton	(quantity Ammonia x index Ammonia of this month) + (quantity Cyclohexane x index Cyclohexane of this month) +H9:H10 (quantity Natural Gas x index Natural Gas of this month) + (quantity Propylene Polymer Grade x index Propylene Polymer Grade of this month)	quantities of raw material coming from BoM Data
Base Price	Cost per ton x (ton packaging weight)	Ton packaging weight coming from the "TonPackaging Weight" Company Parameters table
Change in Price	month	
Change in Price (%)	((Result price this month - Result price previous month) / Result price previous month) x100	
Current Calculation Month date	Index MM-YY	
Raw Material Baseline (separate one per raw material)	index for raw material for this month	Index for Raw material Baseline coming from the "RawMaterialIndex" Company Parameters table
Change in Raw Materials	Base price this month - Base price previous month	
Change in Raw Materials (%)	((Base price this month - Base price previous month) / Base price previous month) x100	
Warehousing costs	Base price x warehousing costs percentage	Warehousing Costs percentage coming from the "WarehousingCosts" Company Parameters table
Packaging costs	Base price x packaging costs percentage	Packaging Costs percentage coming from the "PackagingCosts" Company Parameters table
Total Variable costs	(Base price + warehousing costs + packaging cost)	
Result Price	Total Variable Cost + strategy selection	Strategy Selection coming from the "StrategySelection" Company Parameters table
Margin	Result price - Total Variable Costs	
Result Price Chemicals	Result price + market area adjustment	Market area adjustment coming from the "MarketAreaAdjustment" Company Parameters table
Margin Chemicals	Result Price Chemicals - Total Variable Costs	
Result Price - Floor Price	result price chemicals + Floor adjustment	Floor adjustment coming from the "ManualPriceGuidance" Company Parameters table
Margin - Floor Price	"Result price - Floor Price" - Total Variable Costs	
Result Price - Target Price	result price chemicals + Target adjustment	Target adjustment coming from the "ManualPriceGuidance" Company Parameters table
Margin - Target Price	"Result price - Target Price" - Total Variable Costs	
Result Price - Stretch Price	result price chemicals + Stretch adjustment	Stretch adjustment coming from the "ManualPriceGuidance" Company Parameters table
Margin - Stretch Price	"Result price - Stretch Price" - Total Variable Costs	

Out-of-scope business functions and features (Can be configured, but not included in the Chemical Industry Catalog)

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Implementation Level of Effort

2 sprints/1FTE CE (for non-BOM pricing)
3 sprints for BOM pricing
4 sprints for both

+1.5 sprint if adding to use case 1 (implies that BOM-based pricing already exists and the same approach will be used for both formula and spot)

Base Line Projected Annual Impact*

Parameters (Value Case #34)			General Assumptions (sample)		Projected Annual Impact (for sample)	
Calculations	C-State	F-State				
Improve spot price target achievement with real-time market/cost/value pricing models						
Promoted avg price $/case			RUM	100M	Direct	100k
Average Margin			Margin%	10%		
Percent of Portfolio with spot price exposure	100.0%					
Nr of DAILY price price changes applied to that portion of portfolio	96					
Highg end of % price adjustment per activity	0.50%					
hours/min to execute contract adjustment/renewal	0:05	0:02				
Margin retained due to faster/better execution						

Scope Validation and Project Readiness Workshop – Validation Questions:			
Questions		Answers	
Q1		A1	
Q2		A2	
Q3		A3	
Q4		A4	
Q5		A5	
Q6		A6	
Q7		A7	
Q8		A8	
Q9		A9	
Q10		A10	
Q11		A11	
Q12		A12	
Q13		A13	
Q14		A14	

Prescribed User Stories			
Use Story Name	**I want to…**	**so I can …**	**Acceptance criteria**
Epic: As a Pricing Manager/Pricing Administrator, I want to set up several scenarios covering several price, volume, revenue or cost hypotheses, so I can compare them to help decide which prices to increase and by how much.			
Parameters definitions	Define the appropriate metrics for my business	Adjust them in each scenario to see their impact on costs, volumes, revenues, prices, etc.	The chosen parameters are relevant to the business context under consideration
Parameters tables	Have a table for each parameter to store values I want to work with	Use them in the calculation of costs, volumes, revenues, prices, etc.	Each parameter has its own table with appropriate fields for each scenario, e.g. - Dimensions: dates, geographies, product or customer groupings, distribution channel, etc - Values: raw materials costs, absolute, % variation, factors…
Approach selection	Have several approaches to select from when managing/adjusting prices	Be flexible in my pricing strategy and choose the most appropriate approach for any given situation	Parameters are maintained and adjustable in conjunction. Prices to be stored and visible in a price setting object that allows users to make mass adjustments. Mass price changes with possibility to: - be made based on any given parameter. - add a (currency) amount or percentage to a price as a part of an individual product or mass price change. Ability to define all approaches client needs. For e.g., Explicitly set; Explicitly set with expiration; Formula-based; Anchored prices with automated price changes, etc. Manual overrides. Clearly defined system of managerial approvals or price changes.
Price protection	Set up a system of price protection	Prevent prices from changing until specific agreement date expires.	Set up at along the same level at which prices are manages (e.g., distribution channel, customer grouping, etc.) Price protection to allow a user to set a date for the validity and immutability of the price – meaning regardless of any changes, that set of prices cannot change until that date has passed. Subject to Approval workflow after expiration.
Epic: As a Pricing Manager/Pricing Administrator, I want to see KPIs in the LPG I use to compare scenarios			
LPG Header KPIs	Define the appropriate header level KPIs for my business	Use them to validate the overall LPG	Examples: current and future revenues, margins, margin %…
LPG Line KPIs	Define the appropriate line level KPIs for my business	Use them to validate each line of the LPG	KPIs to be displayed in columns Examples: current and future revenues, margins, margin %, detailed cost, price, volume values…
Epic: As a Pricing Manager/Pricing Administrator, I want to see KPIs in the scenario comparison window of the LPG I use to compare scenarios			
Scenario comparison KPIs definition	Define the appropriate KPIs to compare scenarios with	Use them to choose the best scenario	KPIs will be displayed in columns/fields Examples: current and future revenues, margins, margin %, detailed cost, price, volume values… Calculation logic defined Sources for all parameters clearly defined.
Epic: As a Pricing Manager/Pricing Administrator, I want to use the goal seeking functionality in my LPG			

Configure the "Revenue Change By" setting for goal seeking	Define the appropriate dimension in my goal seeking settings	Use the goal seeking functionality in a relevant way	Any LPG output field can be used and will show in the drop down list for the user to choose from