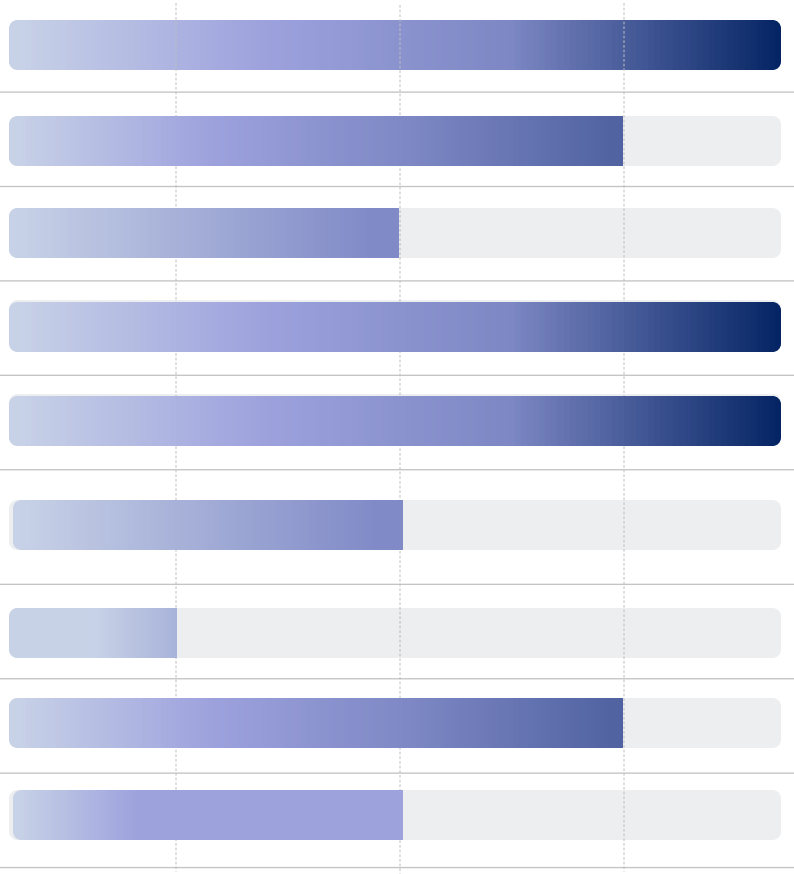
fractal

AI-Driven Supply Chains: Unlocking Value, Innovation & Growth

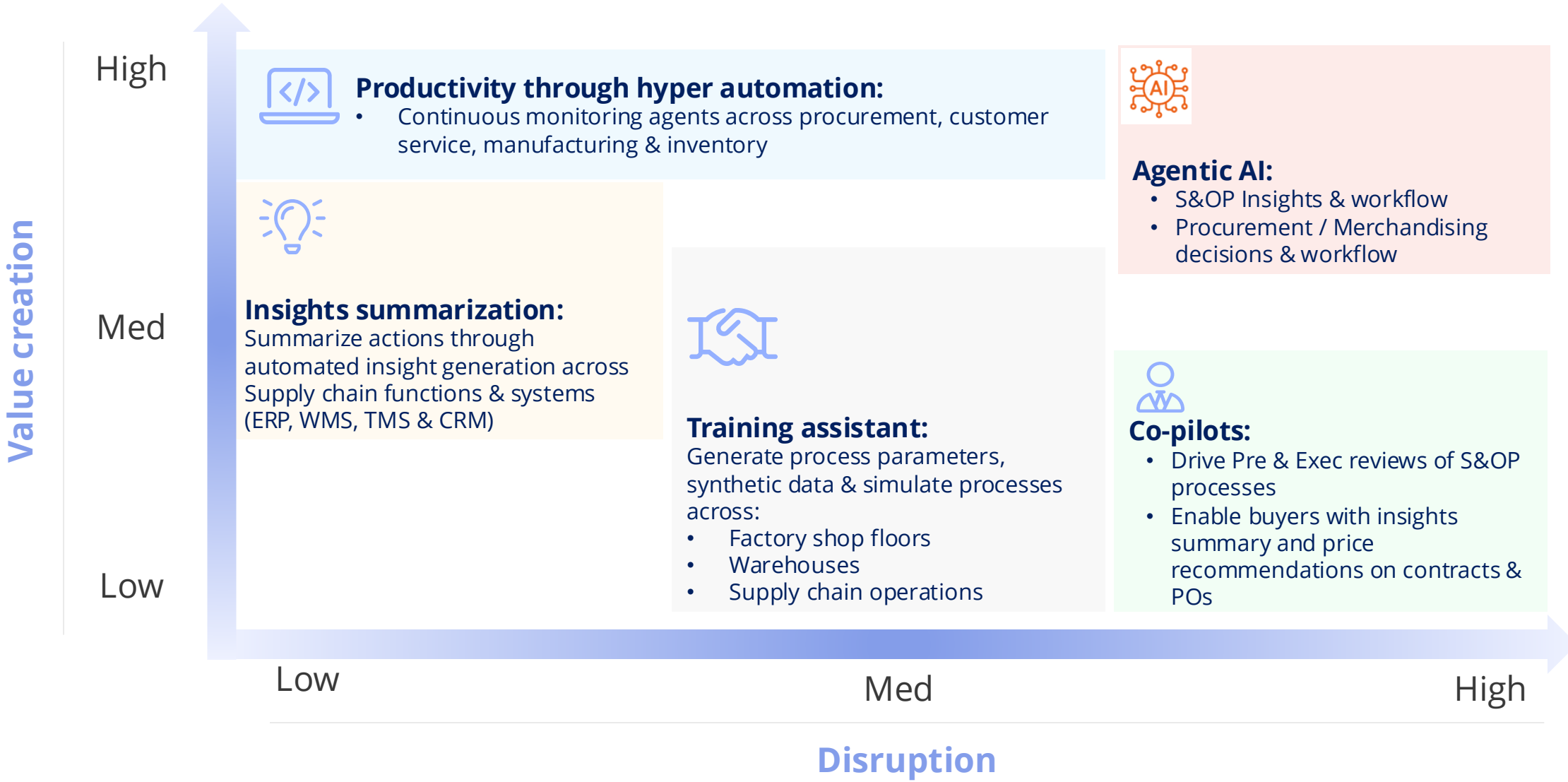
Mar 2025

“GenAI Agents” – potential unlock across Supply chain

Gen AI features	Potential for value unlock across Supply chain
Automated insights from structured & internal databases	
Automated insights from external databases / subscriptions	
Deliver on demand insights through conversational ai	
Summarized & integrated insights from internal & external	
Recommendations / actionable AI	
Content generation / collation of insights in PDF / PPT / email formats	
Automated reading of calendars & emails	
Triggering workflows	
Continuous monitoring for anomalies	



Gen AI significantly unlocks value across Supply Chain



fractal

GEN AI OFFERINGS

Process Assistants across Industries

S&OP

- External & Unstructured insights for long term demand sensing
- Virtual assistant driving summarization of insights required for Pre & Final S&OP reviews
- Automated cross functional Insights for touchless planning
- Collaboration across S&OP stake holders for actions & alignments

Procurement

- Buyer Intelligence with Supplier & Raw material / Supplier Insights
- External insights on commodity trends, supplier landscape, benchmarking
- Recommendations on Negotiations & Contract renewals
- Contract generation
- Data Interrogation

Shop floor

- Enable trouble shooting through recommendations next best action thru digital logs
- Interactive shop floor training based on SOP, Critical process parameters & simulate potential failures through synthetic data

S&OP

Some of the insights needed across S&OP…

Demand

How can we ensure we are able to meet the changing demand?

- Early sense the demand from various of the demand signals
- Leverage the baseline forecast in decision making

ALIGN

Supply

How do I maintain flawless supply mix to volatile demand?

- Right inventory at right place and right time
- Customer responsive networks

Financial Plans

How can we align business priorities and strategy into monthly S&OP decisions towards execution?

- Enable financial reconciliation
- Analyze the business drivers behind growth & profitability

INTEGRATE

Operational Plans

How can we enable collaboration across functions?

- Automate various of the inputs into the monthly cycle
- Analyze past performance and guide the focus on next cycle

Strategic / Long-term Plans

How can we consider risk while decision making in S&OP process?

- Incorporate risks across reliability & distribution failures (of the past) into monthly S&OP decision making?

TRANSLATE

Day-to-Day Operations

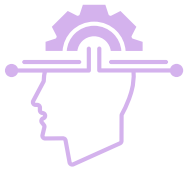
How can we enable decision making for planners?

- Real time cross functional enterprise-wide visibility
- Scenario comparison to determine trade offs across measures

…to enable a seamless consensus through AI driven insights & reasoning

Meeting the changing demand

- How can we early sense the demand from various of the demand signals?
- How can we leverage the baseline forecast in decision making?



Enable decision making for planners

- How can we bring insights from real time cross functional enterprise wide visibility?
- How can we enable scenario comparison to determine trade offs across measures

Align business priorities and strategy into monthly S&OP decisions

- How can we enable financial reconciliation?
- How can we analyze the business drivers behind growth & profitability?

Risk across execution process

- How can we incorporate risks across reliability & distribution failures (of the past) into monthly S&OP decision making?

Collaboration across functions

- How can we automate various of the inputs into the monthly cycle?
- How can we analyze past performance and guide the focus on next cycle?

Reimagining S&OP process through Agentic AI

CURRENT STATE:

BUSINESS PROBLEMS IDENTIFIED

Fragmented Functional Insights:
- Insights scattered across various functional roles and departments thus creating information silos

Productivity Loss :
- Extensive manual for insights collation & analysis
- Error-prone processes limit decision-making agility.

Cross-Functional Alignment during Pre-S&OP:
- Siloed departmental perspectives & communication gaps.
- Hinders alignment and decision consensus, leading to disjointed processes.

Limited Predictive Capabilities / Pocketed Intelligence
- S&OP lacks advanced predictive analytics capabilities.
- Valuable insights, such as demand forecasting and risk identification, are underutilized.

Inadequate On Demand Insights:
- Decision-makers lack real-time data insights and recommendations during S&OP meetings

FUTURE STATE INTERVENTION:

Reimagine S&OP with GEN AI

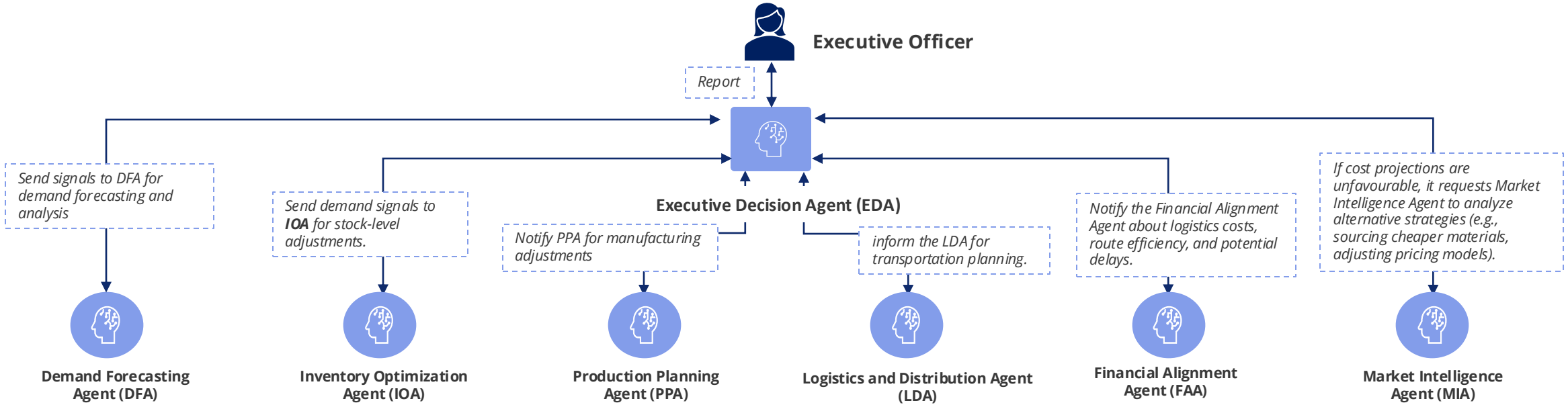
Proactive Pre-S&OP Insights
- Provide decision-makers with insightful data, reports, and recommendations in advance to facilitate strategy and planning discussions during Pre-S&OP meetings.
- Generate focused “actions” to improve the speed & quality of decisions.

Functional Insights Collation:
- Collect & automate analysis of various siloed functions
- Collate and organize cross functional S&OP insights tailored to specific functional roles

Cross-Functional Intelligence:
- Develop comprehensive intelligence to identify demand-supply gaps
- identify and highlight inefficiencies – overstock and out of stock
- Predict risks, including "Demand at Risk" and "Capacity White Spaces."
- Provide early warnings for proactive risk mitigation.

On Demand deep dive analysis:
- Empower users to dive deep into insights in real-time through conversational interactions with GEN AI.

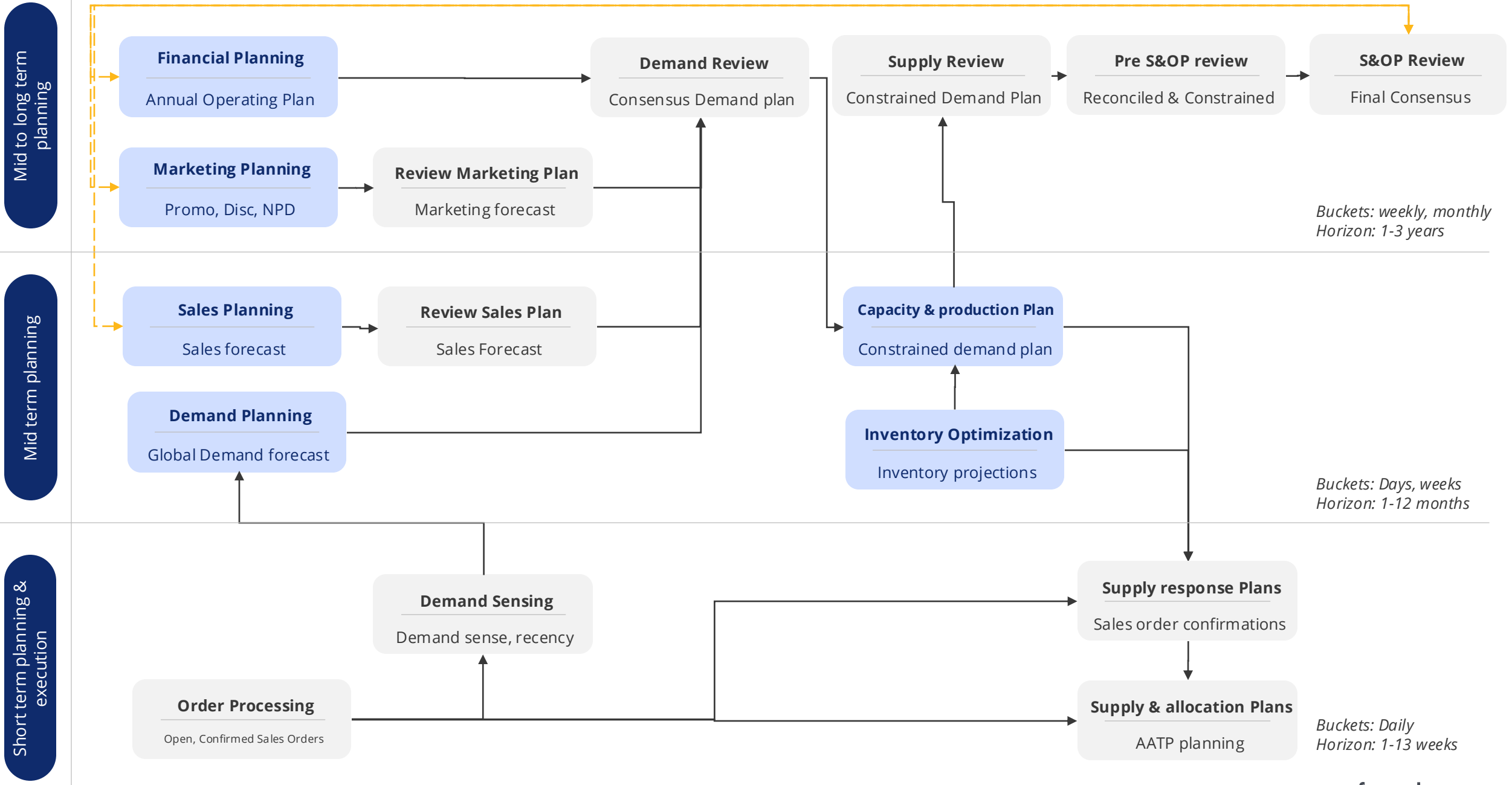
Multi-Agent Interaction Workflow for S&OP



	Demand Forecasting Agent (DFA)	Inventory Optimization Agent (IOA)	Production Planning Agent (PPA)	Logistics and Distribution Agent (LDA)	Financial Alignment Agent (FAA)	Market Intelligence Agent (MIA)
Task	*Predict future demand*	*Evaluate demand fluctuations and recommends stock levels across warehouses.*	*Adjust manufacturing schedules based on demand and inventory insights.*	*Optimize transportation and delivery schedules*	*Evaluate the cost implications of production, logistics, and inventory decisions.*	*Monitor competitor pricing, consumer sentiment, and macroeconomic trends.*
Tool	• *ML Model for Demand Forecasting* • *Gen AI model for Qualitative Insights* • *Report Generation service*	• *Reinforcement learning model for optimization*	• *MES (Manufacturing Execution System)* • *ERP (SAP, Oracle)*	• *Route Optimization (Google OR-Tools, OptaPlanner)* • *TMS (Transportation Management System)*	• *Financial Analytics (Anaplan, SAP)*	• *Web Scraping* • *Social Listening (Brandwatch)* • *NLP for Insights*
Data	*Historical Sales Data* *Market Trends* *Retailer POS Data* *Weather & Economic Indicators*	*Warehouse Inventory Data* *Demand Forecast* *Real-time Sales Data*	*Raw Material Availability data* *Production Capacity data* *Supplier Lead Time data*	*Supplier & Warehouse Locations data* *Traffic & Weather data* *Carrier Constraints data*	*Cost Data* *Profitability Analysis data* *Budget vs Actuals data*	*Competitor Pricing data* *Consumer Reviews & Trends data* *Market Reports data*

fractal

S&OP agents across each of process node covering L1 & L2 processes



Case study

Mitigating Demand Risks in Real-Time: GenAI's Adaptive Insights and Conversational Support

Client Context and Business Challenge

Client Context

- A global food and beverage company facing significant challenges in supply plan iterations to respond to demand risks
- IBP leaders' vision is to be able to assess magnitude and severity of risk in more agile fashion. Leveraging agentic frameworks

Business Challenge

- Limited data visibility and quality
- Difficulty capturing complex demand patterns
- Inability to adapt to market dynamics and unforeseen events
- Limited incorporation of contextual factors and business knowledge

Our Tailored Solution Approach

Decision Intelligence

- **Demand at risk**: AI compares evolving demand with inventory and supply plans to assess risk across customer segments etc.
- **Driver analysis:** : AI delineates the drivers of what are the reasons of risk, considering both supply and demand side factors

AI/GenAI

- **LLM-Powered conversations**: Real-time in conversational manner; Contextual understanding on th flow of questions
- **Forecast accuracy improvement**: Adaptive and self-learning models that continuously improve prediction accuracy

Data Engineering

- **Scalable AI Architecture**: Cloud-native, modular system processes high-volume granular demand and inventory data from ERP and advanced planning systems
- **Unstructured Data Processing**: Ingests, cleans, and structures external reports from various formats for AI-driven analysis and automation.

Empowering Transformations, Unlocking Value collectively

Transformation realized

- Enabled AI-driven monitoring of demand at risk proactively, perform root-cause analysis fast in conversational manner, and collaborate with cross functional teams for mitigation actions

Value Unlocked

- **15%+ Incremental revenue** through identification of Demand At Risk, Capacity & Inventory rebalancing
- **30% reduction in time to decisions** from deployment of human + agent framework in risk assessment and RCA

Procurement assist

Reimagining Negotiations through *Procure.ai*

CURRENT STATE:

BUSINESS PROBLEMS IDENTIFIED

Fragmented Insights:
- Insights scattered across various sources and systems.
- Risk of incomplete insights.

Productivity Loss:
- Time-consuming & laborious process.
- Limited pursual of periodic negotiations.

Limited Human Intelligence:
- Reliance on a mix of analytics, market studies, & intuition
- Slows down the negotiation process and responsiveness.

Absence of Insights Docket :
- No centralized repository, impacting decision agility & potential biases

Security
- Unauthorized access risks compromising business sensitive information.

FUTURE STATE INTERVENTION:

Reimagine Negotiation with GEN AI

Unified Insights & Automated Decision support
- Collate Negotiation Insights docket across Contracts & AI driven pricing from multiple sources.
- Streamline the negotiation process by automating intelligence gathering

Augmented Human-AI Intelligence
- Leverage price forecasts (from multiple systems), market studies, and human intuition to build valuable intelligence on potential price ranges

Automated Benchmark Analysis:
- Implement automated benchmark analysis for quick adjustments based on market trends and thus revisit contracts periodically

Centralized Insights Repository
- Democratize insights across spend pools & categories

Procurement Policy playbook
- Assist in policies through conversational AI for contextual interactions & improved decision-making

Automated Contract documentation
- Assist in automated creation of contracts, post negotiations

Unlocking value through Procurement transformation

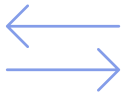
1

SUPPLIER'S CONTRACT VISIBILITY

Real-time contract status for timely actions.

25%
Boost in procurement efficiency

2



CONVERSATIONAL SUPPLIER ANALYSIS

Advanced Gen AI analysis for performance insights.

20-30%
ROI by cutting costs & improving interactions

3

NEGOTIATION COACH & UNIFIED INSIGHTS

AI-powered strategies for negotiation excellence.

80%
automation of the workload

4

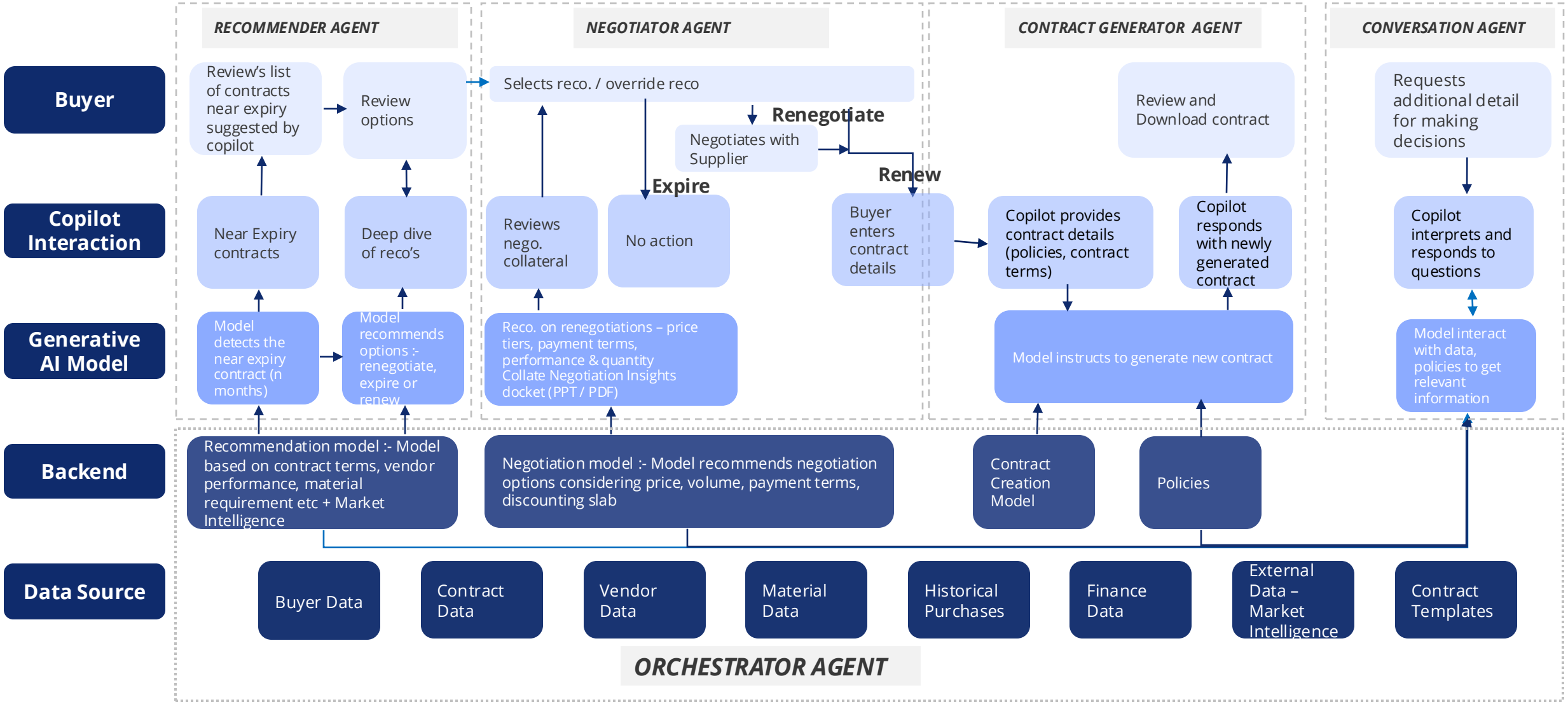
SMART PROCUREMENT POLICY PLAYBOOK

AI insights merged with human expertise in contract creation.

30%
enhanced workforce productivity

VALUE REALISATION

Buyer's journey towards Intelligent Negotiations



fractal

Case study

Efficient Contract negotiation & tail spend reduction

Client Context and Business Challenge

Client Context

- A global switch gear company facing significant challenges in negotiating contracts at regular frequency
- Procurement teams strongly believe that there is a potential to save multi million dollars through effective negotiations

Business Challenge

- Lack of Insights
- Time-Consuming Contract Analysis
- Lack of Standardization
- Compliance & Risk Management
- Manual Contract creation

Our Tailored Solution Approach

Decision Intelligence

- **Context-Aware Contract Insights**: AI compares extracted parameters with benchmarks, enabling risk assessment and better negotiation.
- **Contract term recommendations**: AI recommends optimized terms based on past contracts, legal best practices, and compliance needs.

AI/GenAI

- **LLM-Powered Contract Intelligence**: Extracts and highlights key contract parameters using LLMs, enabling faster analysis and reducing manual effort.
- **Automated Contract Generation**: Uses GenAI to generate tailored contracts based on user inputs, ensuring consistency, compliance, and efficiency.

Data Engineering

- **Scalable AI Architecture**: Cloud-native, modular system processes high-volume contracts and integrates seamlessly with procurement platforms.
- **Unstructured Data Processing**: Ingests, cleans, and structures contract data from various formats for AI-driven analysis and automation.

Empowering Transformations, Unlocking Value collectively

Transformation realized

- Enabled AI-driven contract intelligence, streamlining negotiations, automating workflows, enhancing efficiency, and empowering the procurement team to conduct contract negotiations with greater frequency and improved decision-making.

Value Unlocked

- **$20M+ Cost Savings in Sourcing**: AI-driven contract analysis and negotiation optimization unlock significant cost reductions through improved terms and supplier alignment.
- **12% Increase in Buyer Productivity**: Automating contract review and generation streamlines workflows, reducing manual effort and accelerating decision-making.
- **10% reduction in tail spend leakage**: Achieved smarter procurement decisions through AI-driven insights, enabling enhanced visibility and control

Manufacturing Digital Ops

MRO Digital Ops through Manufacturing digital ops

CURRENT STATE:

BUSINESS PROBLEMS IDENTIFIED

Identify risk and causation of failure:

- Machine failures are often detected after the fact happens and it takes a lot of manual effort and multiple data sources to identify what caused it

What should be the action and what is impact:

- Limited visibility into historical actions taken for similar failures
- Limited visibility into impact of downtime because of the repair/replacement

Spare parts and restocking:

- Where are the spare parts?
- When should I place a new order for spares?
- What is the overall cost to get the line back up again?

FUTURE STATE INTERVENTION:

Reimagine Machine maintenance with GEN AI

Interactive questions through Conversation AI:

- Intelligent conversations with machine logs and process parameters data
- Extract key insights & summary of process steps, critical process parameters and potential failure reasons

Recommendations on optimal action and impact:

- Leverage existing AI & analytics models
- Analyze best possible action based on historical data and the corresponding impact on cost, downtime and personnel requirements

Maintain optimal spare parts inventory:

- Leverage optimization algorithms
- Explore spare parts availability and recommend optimal re-order points based on historical consumption and current status of the machines

Reimagining Floor Training through Plant Operator trainer

CURRENT STATE:

BUSINESS PROBLEMS IDENTIFIED

Longer training calendars:
- Manufacturing floor operator training content & schedule is static, longer and conflicting schedules

Limited to Standard Operating procedures:
- Typically training is based on Standard operating procedure documents
- Limited on floor training hours

Restricted to known scenarios:
- Training is limited to known scenarios and operating thresholds
- Limited experimentation to understand the possibilities

FUTURE STATE INTERVENTION:

Reimagine Shop Floor training with GEN AI

Interactive training through Conversation AI:
- Intelligent conversations with Standard Operating Procedure documents
- Extract key insights & summary of process steps, critical process parameters

Virtual assessment of through put & efficiency:
- Leverage existing AI & analytics models
- Gain knowledge on critical process parameters, their thresholds and interdependencies
- Simulate processes to arrive at step by step iterations to achieve Yield and efficiency

Explore Unlimited possibilities:
- Leverage GenAI capabilities to generate synthetic data
- Explore the synthetic generated data for simulations for potential future scenarios

Thank You.

A strategic partner to the most admired Fortune 500® companies globally, we help power every human decision in the enterprise by bringing advanced analytics & AI, engineering and design.

fractal.ai