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Empowering product information management (PIM) with Generative AI (GenAI)

A new frontier in digital commerce

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How GenAI can improve product information management (PIM)

GenAI presents opportunities that can change the future of product information management (PIM). Product Information today is inherently fragmented along the product life cycle by where it originates and how it is aggregated and enriched. Variations exist in context and usage across the organization, ecommerce channels, and the partner ecosystem. Enhancements to traditional PIM capabilities with GenAI have the potential for profitable solutions for digital commerce across industries, delivering costs optimization, efficiency improvements, and revenue growth.

Research has suggested that breakthroughs in GenAI could increase global GDP by 7%—nearly $7 trillion—and boost productivity growth by 1.5 percentage points[1]. By 2025, organizations that use AI across the marketing function will shift 75% of their staff's operations from production to more strategic activities[1].

The majority of product content, including product descriptions, product images, personalization, and translation, are expected to be AI-generated in near future[1]. The enrichment can extend beyond structured data to integrate time series data, images, videos, and speech. Event-driven integrations and automation of repetitive manual data management tasks such as product data entry, product classification, image association, reviews for data quality, and regulatory compliance are making GenAI a co-pilot that augments human capability, delivers speed to outcomes, and provides efficiencies at scale in product management.

Use cases that empower PIM with GenAI capabilities across industries and product life cycle are explored below. Product and digital commerce leaders are encouraged to consider these use cases when developing strategies to add business value.

Getting to know GenAI

To consider the potential impact of GenAI in PIM, it's helpful to understand what GenAI is and how it operates.

- AI is the capacity of machines to perform tasks that simulates human intelligence such as data processing, problem solving, and robotics.

- GenAI is a sophisticated subset of AI that uses large parameter models to create data across modalities of structured, sequential, vision, NLP, and graphs.

- GenAI creates original content such as text, images, audio, code, and video, and adds contextual awareness. It automates human-like decision-making to workflows, thus changing how work is performed.

What does this mean for digital commerce?

Product information is the foundation for digital commerce to respond to competitive pressures and deliver new customer experiences. Product managers need to rapidly innovate, implement, and release product features based on the voice of the customer (VoC) and changing customer expectations. Accordingly, customer experiences need to be continuously optimized at touchpoints to maintain an organization's competitive edge.

Below are some select use cases primed for GenAI to empower PIM and transform digital commerce.

Marketing
Personalized marketing
Impactful personalized marketing and recommendations.
GenAI can analyze vast amounts of product data from PIM against trends, customer preferences, and behavior patterns. Factoring in customer input and preferences, GenAI can create tailored product suggestions based on real-time customer interactions. This can lead to more targeted and hyper-personalized product suggestions, enhancing the shopping experience and increasing the likelihood of purchase.

Customer support
Customer service automation
Virtual assistants, personalized Interactions, and proactive support
Enriched product information in PIM enables AI-powered chatbots and virtual assistants that can interact with customers in real time, providing tailored responses and troubleshooting tips. GenAI can predict potential customer issues based on product usage patterns, allowing businesses to proactively reach out to customers with solutions. This can reduce the number of inbound support requests, enhance the customer experience, and build trust.

Virtual reality
Visual search and augmented reality
Enhanced product discovery, product visualization, and virtual try-on
GenAI-driven visual search can help customers discover products that match their style or preferences by analyzing visual attributes such as colors, shapes, and patterns via power augmented reality (AR) applications that allow customers to visualize products in their own environment. This helps customers make more informed purchasing decisions by seeing how products will look in their space, reducing returns and increasing confidence and conversion rates.

Supply chain
Optimization of inventory levels
Real-time inventory visibility, dynamic promotions
GenAI can provide end-to-end visibility across the supply chain by analyzing data from PIM with various sources, including suppliers, logistics providers, and data lakes. Event-driven integrations can trigger promotions in real-time based on inventory levels, demand forecasts, and market conditions, helping ensure products are sold at the right time at the right price.

Product innovation
Competitive product development
More dynamic and responsive product road maps
GenAI and PIM can integrate insights from customer feedback, competitor analysis, and supply chain data into the product development process, enabling targeted product improvements and innovations.[2] This ensures that new products and updates align with customer preferences, trends, and compliance legislations, and outperform the competition, thereby increasing the likelihood of market success.

Automation
Automated data management
Auto-analyze, organize, and improve accuracy and completeness.
GenAI can be used in PIM to automatically identify and extract foundational product data from multiple sources and cleanse, standardize, and harmonize data, and it can bulk create new SKUs and categorize, enrich, and translate. This enables faster data intake and distribution of accurate and complete product information to channels. In addition, AI can rapidly accelerate data quality improvement efforts through outlier detection, attribute extraction, and retrieval augmented generation to fill missing information.[4]

Upfront investment in GenAI

GenAI has the potential to transform PIM and digital commerce. It will take upfront investment in time and money. Companies that are adopting AI can have various levels of maturity from AI experimentation to implementing AI at scale. Key value levers can include:

- **Speed to execution**: Minimize latency to accelerate time-to-business outcomes
- **Cost reduction**: Automate processes, tasks, and interactions to increase efficiency and reduce cost
- **Reducing complexity**: Decipher patterns and predict outcomes to improve decisions[2]
- **Transforming engagement**: Change how humans interact with systems by expanding the modes of engagement though voice, vision, touch, and text
- **Fueling innovation**: Generate deep insights on "Where to play?" and "How to win?", enabling new product development and new market opportunities
- **Fortifying trust**: Deliver a consistent brand message and secure the brand from intrusion, enhancing trust among customers

Limitations of GenAI

While the future looks promising, GenAI has limitations that product managers and digital commerce leaders should consider.

Fairness and impartiality

Humans train the foundation models that power GenAI and humans bring to the work inherent biases. The data set used to train models has to be governed to eliminate bias. Consideration of how the customer will respond to outcomes from the model will also have to be evaluated regularly to ensure customers are not negatively impacted by unpredictable output due to historical data and hallucinations.

As detailed in Deloitte's Trustworthy AI™ framework,[3] organizations can design GenAI capabilities that are fair and impartial, transparent and explainable, reliable, safe, and secure, thus guiding models to reduce bias in content.

Cost and complexity

AI models require access to substantial amounts of data. With small data volumes, the potential for GenAI to produce inaccurate content may increase as the models that are still learning.[2] All PIM applications do not have the necessary data model and capabilities to effectively integrate with AI technologies. When considering AI-powered PIM capabilities, ensure that they do not require custom development for data model or integrations as this will add additional cost and complexity.

It is recommended that product and digital commerce leaders restrict initial usage of AI capabilities in PIM to increase accuracy of integrations and certify models and output before expanding adoption.

Safety and security

Powerful technologies are often targets for malicious behavior, and GenAI can be susceptible to harmful manipulation. A GenAI-enabled PIM system could erroneously create products or offerings that do not exist and promote those to a customer base, leading to brand confusion and potentially brand damage. More troubling, in the hands of a bad actor, GenAI content could be used maliciously to create misleading content to harm the business and its customers.

Product and digital commerce leaders should partner with enterprise technology teams to establish standards and to address cybersecurity risks and stakeholders need to continuously align GenAI outputs with business objectives and customer interests.

Accountability and human insight

AI model cannot be meaningfully held accountable for its outputs, and hence accountability is squarely a human domain. It is critical to keep human product managers and data stewards in the loop for monitoring inputs and outputs for GenAI models powering PIM to ensure data used needs is align with use case targeted. Absence of human intervention could lead to missing products in catalogs or more focus on popular brands.

Product and digital commerce leaders should enable stakeholders with the capacity and tools to understand GenAI models, its function, and validate outputs to determine value realization.

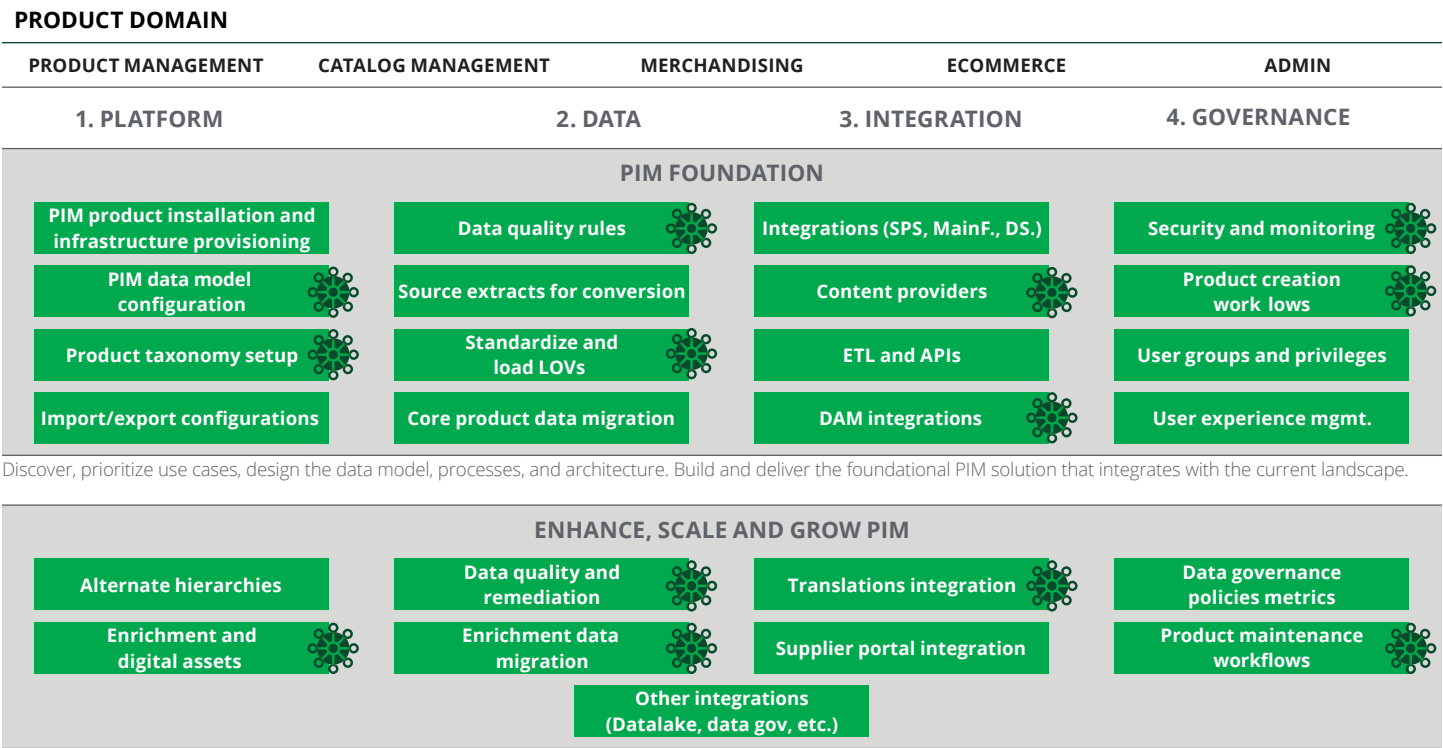# Solution architecture for integrating PIM with GenAI

Effective data flow, real-time processing, and robust analytics capabilities are prerequisites.
Key components of enabling solution architecture include a data ingestion layer, API gateways for data synchronization, and AI and machine learning components to develop, deploy, and train GenAI models. PIM will leverage integration with analytics tools to generate insights, and integration with digital commerce platforms to enhance product recommendations, search, and customer support. Customer interaction interfaces can then facilitate AI-powered chatbots, virtual assistants, and AR applications.

Key components and interactions to empower PIM with GenAI:

- Data ingestion
- Event-driven integration
- AI and machine learning
- Data processing and analytics
- Digital commerce application layer
- GenAI security and governance
- User interface and interaction layer
- GenAI monitoring and management

Opportunities to power PIM with GenAI

PRODUCT DOMAIN

PRODUCT MANAGEMENT	CATALOG MANAGEMENT	MERCHANDISING	ECOMMERCE	ADMIN
1. PLATFORM	**2. DATA**	**3. INTEGRATION**		**4. GOVERNANCE**

PIM FOUNDATION

PIM product installation and infrastructure provisioning	Data quality rules	Integrations (SPS, MainF., DS.)	Security and monitoring
PIM data model configuration	Source extracts for conversion	Content providers	Product creation work lows
Product taxonomy setup	Standardize and load LOVs	ETL and APIs	User groups and privileges
Import/export configurations	Core product data migration	DAM integrations	User experience mgmt.

Discover, prioritize use cases, design the data model, processes, and architecture. Build and deliver the foundational PIM solution that integrates with the current landscape.

ENHANCE, SCALE AND GROW PIM

Alternate hierarchies	Data quality and remediation	Translations integration	Data governance policies metrics
Enrichment and digital assets	Enrichment data migration	Supplier portal integration	Product maintenance workflows
	Other integrations (Datalake, data gov, etc.)		

Continue to evolve the PIM solution to include additional products and systems, supplier items, merchandising and marketing content, digital assets, and translations.

Conclusion

While the opportunities presented by the use cases to empower PIM with GenAI deployments are promising, it is important to consistently govern GenAI capabilities across the product lifecycle and mitigate inherent risks. For many organizations, the risks of not embracing GenAI outweigh the risks the technology creates.

No matter what stage of the AI journey you are in with PIM and digital commerce, whether you are a board member, a C-suite leader driving digital strategy for your organization, or a hands-on data scientist bringing AI strategy to life, we can help you leverage AI for a competitive advantage.

Please visit: State of Generative AI in the Enterprise 2024 | Deloitte US

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