BREAKING DATA BARRIERS WITH GENAI AND LLM-DRIVEN INSIGHTS

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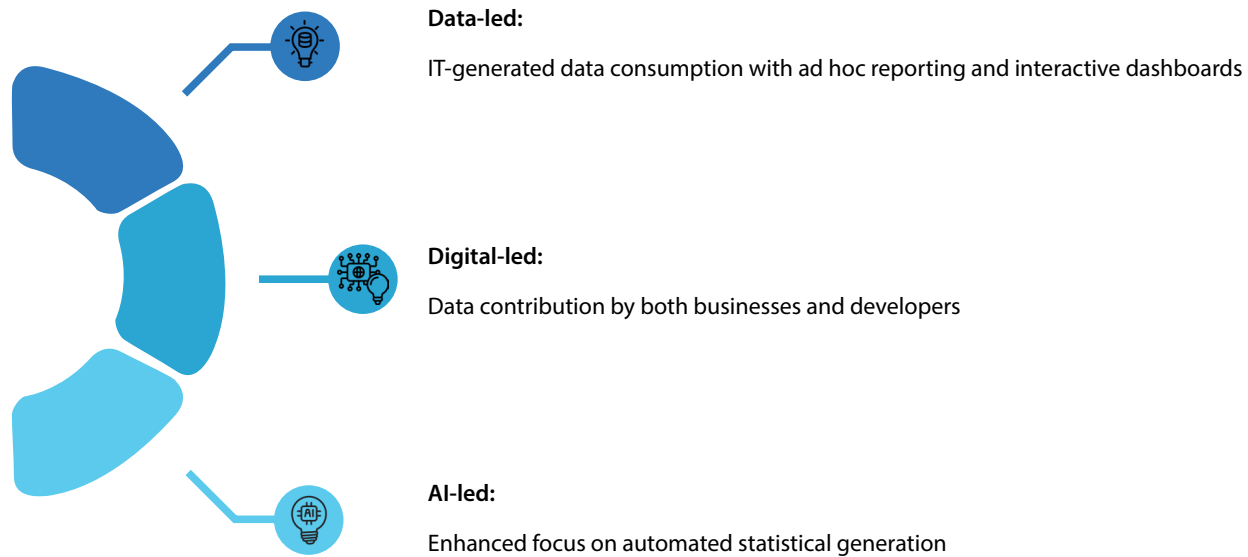Navigate your next
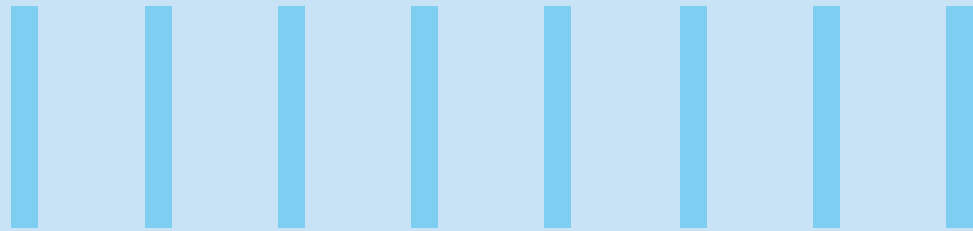
The enterprise data landscape is transforming significantly, with artificial intelligence (AI) and large language models (LLMs) taking center stage. To match pace with the growing need for automation, personalization, and compliant practices, organizations are seeking innovative business intelligence (BI) solutions. Such solutions can help process vast data sets and execute sophisticated algorithms to augment business decisions and attain operational excellence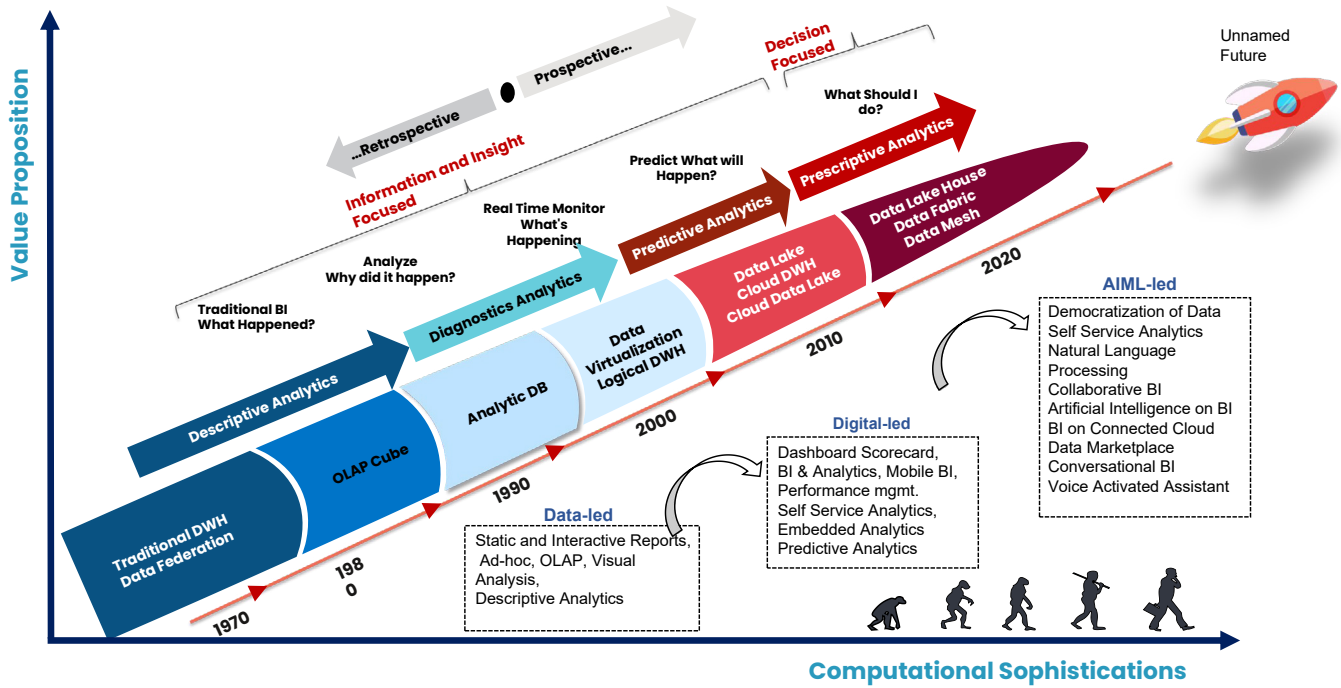. Sophisticated models like GPT-3 stand testimony to intuitive, conversational interactions that users engage in with data. Generative AI can help firms collaborate seamlessly with LLMs to elevate guided consumption, address data scarcity and simulations, automate report generation, and democratize data access.

Through this whitepaper, we will delve into the transformative impact of Gen AI and LLMs on business intelligence for enterprise data consumption.

The evolutionary journey of BI: From static reports to conversational insights

The landscape of modern data consumption has undergone a profound transformation, driven by disruptive forces such as the surge in data volume, increased cloud adoption, and the integration of next-gen AI tools. These influences have reshaped data generation, processing, and consumption, delineating *three pivotal eras in the evolution of BI tools:*

Data-led:

IT-generated data consumption with ad hoc reporting and interactive dashboards

Digital-led:

Data contribution by both businesses and developers

AI-led:

Enhanced focus on automated statistical generation

Value Proposition (vertical axis)

Decision Focused

Unnamed Future

...Retrospective

Prospective...

Information and Insight Focused

What Should I do?

Predict What will Happen?

Real Time Monitor What's Happening

Analyze Why did it happen?

Traditional BI What Happened?

Prescriptive Analytics

Predictive Analytics

Diagnostics Analytics

Descriptive Analytics

Data Lake House Data Fabric Data Mesh

Data Lake Cloud DWH Cloud Data Lake

Data Virtualization Logical DWH

Analytic DB

OLAP Cube

Traditional DWH Data Federation

1970 1980 1990 2000 2010 2020

AIML-led
Democratization of Data
Self Service Analytics
Natural Language Processing
Collaborative BI
Artificial Intelligence on BI
BI on Connected Cloud
Data Marketplace
Conversational BI
Voice Activated Assistant

Digital-led
Dashboard Scorecard,
BI & Analytics, Mobile BI,
Performance mgmt.
Self Service Analytics,
Embedded Analytics
Predictive Analytics

Data-led
Static and Interactive Reports,
Ad-hoc, OLAP, Visual Analysis,
Descriptive Analytics

Computational Sophistications (horizontal axis)

Internet and cloud computing emerged and accelerated the data consumption evolution, but enterprises soon realized the need for advanced solutions to cope with the information deluge. The answer was found through big data and advanced analytics, with technologies like Apache Hadoop and Apache Spark that could rapidly process massive data volumes.

Later, BI tools further evolved to integrate such data lakes, where extensively structured and unstructured data could help unlock the potential of big data for insights and predictive analytics. Analysis of voluminous datasets and predictive model generation gained momentum with the ascension of AI and ML, with intelligent algorithms empowered by natural language processing (NLP)-driven conversational interfaces, broadening data consumption accessibility.

Today, the journey continues with augmented analytics, where AI-driven insights seamlessly integrate into BI platforms and generate relevant findings and recommendations. Automated data preparation and cleansing help enterprises reduce time spent on data wrangling, leading to faster analysis.

The ongoing evolution underscores the dynamic nature of data consumption in the contemporary era. A massive chunk of organizational data lies buried in natural language text files, machine logs, and, increasingly, intelligent products. Organizations must harness the power of GenAI to decipher this digital surplus.

Decoding data renaissance with GenAI and LLM

Future-forward organizations are eager to fortify their business decisions to enhance productivity, address customer concerns in real-time, and achieve cost-effective outcomes. The surge in GenAI and LLM technologies is reshaping how BI vendors structure their offerings. They are strategically incorporating GenAI and LLM to redefine how companies interact with their data, help them foresee potential customer queries, and even propose questions they may have yet to consider.

On the one hand, GenAI stands at the forefront of this transformation, introducing advanced algorithms that propel BI tools beyond traditional analytics. The impact on enterprise data consumption is monumental, endowing businesses with unparalleled data synthesis, interpretation, and decision-making capabilities. On the other hand, LLMs – integral subsets of GenAI, can assist enterprises with linguistic enrichment. They focus on natural language understanding and generation and help personnel swiftly sift through extensive text datasets to extract the most relevant information.

With businesses becoming more aware of progressive technologies, there is a heightened focus on specialized software solutions offering context-sensitive insights extraction. Companies are entering an era of prioritized natural and intuitive interactions with customers and stakeholders.
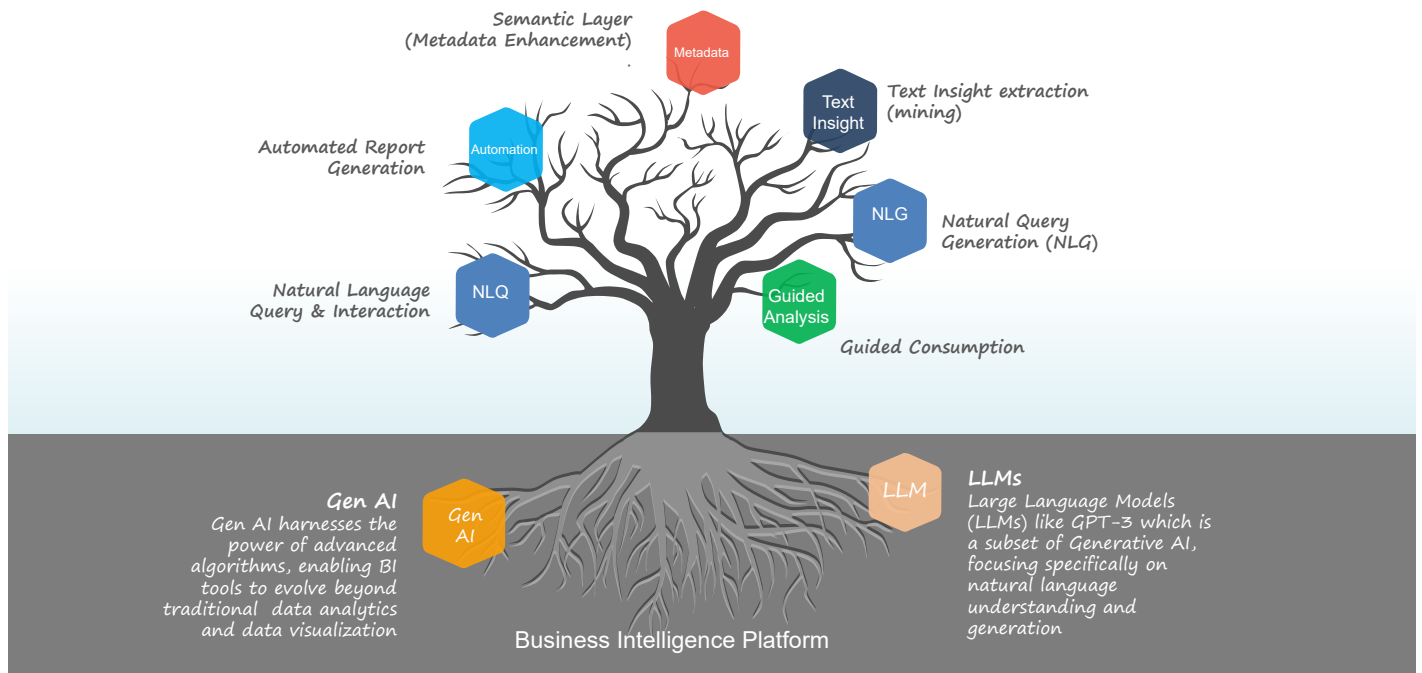
Unveiling next-gen data consumption trends

Forbes emphasizes the transformative power of GenAI and LLMs on BI offerings–poised to enhance data querying and reporting capabilities, facilitating more intuitive and conversational user interactions with data. Data-driven decision-making is becoming more inevitable than ever. However, businesses must venture beyond the hype of trendsetter technologies and recalibrate their strategies with the fundamental goals of solving business problems.

Let us have a look at the trends fuelling modern data consumption:

Trend Tree - Gen AI and LLM in Data Consumption

Semantic Layer
(Metadata Enhancement)

Metadata

Text Insight extraction
(mining)

Text Insight

Automated Report
Generation

Automation

NLG

Natural Query
Generation (NLG)

Natural Language
Query & Interaction

NLQ

Guided Analysis

Guided Consumption

Gen AI
Gen AI harnesses the power of advanced algorithms, enabling BI tools to evolve beyond traditional data analytics and data visualization

Gen AI

LLM

LLMs
Large Language Models (LLMs) like GPT-3 which is a subset of Generative AI, focusing specifically on natural language understanding and generation

Business Intelligence Platform

Redefining business conversations with Natural language query (NLQ):

AI and BI span various applications, including automating anomaly detection and generating predictive insights. However, the spotlight is currently on NLP. What BI vendors traditionally employed for translating natural language queries into SQL is now witnessing a paradigm shift. This transition introduces differentiation through prompt engineering, enabling vendors to enrich questions with data and semantic context. Today, Duet AI or Vertex AI comes with upgraded natural language interfaces with LLMs allowing users to interact conversationally with data, eliminating the need for complex SQL queries. For example, users can type "What were our top-selling products in Q3 2024?". The LLM model will adeptly convert this natural language inquiry into a precise data query and retrieve the answer from the company database.

Rescripting narratives with Natural language generation (NLG):

GenAI will spearhead the future of storytelling. Besides presenting raw data or graphs, BI tools with NLG capabilities can craft linguistically rich descriptions by translating spoken and text inputs. This evolution caters to the business need to generate text-based narratives and enhance self-service analysis. For instance, a business focusing on hyperlocal operations can leverage a sales dashboard to add search queries and receive text-based explanations or comparisons that uncover hidden patterns, leading to additional insights.

Empowering businesses with Guided analytics:

Firms can use guided analytics to redefine their strategies based on proactive suggestions, such as proposing the next steps or recommending additional questions based on user inquiries. Guided analytics can be a crucial differentiator, helping businesses stand out. Departments like Sales, Finance, Marketing, IT, Operations, and HR can leverage this approach to study trends, consumer patterns, or even region-wise product performance over a stipulated period. It only makes sense that out of 75% of the value that GenAI use cases could deliver – marketing, sales, and customer operations stand out as critical areas.

Harnessing contextual insights with LLM-powered mining:

LLMs demonstrate exceptional proficiency in comprehending the intricacies and nuances of language, thereby enhancing the accuracy of text mining results. LLMs display versatile capabilities – from automating various processes like report summarization to generating natural language searches for enterprise data. Thanks to sentiment analysis, a new layer of understanding has recently been added to textual data. As a seamless bridge between raw data and human language, LLMs can streamline the process of uncovering valuable insights hidden within vast unstructured datasets. Using those insights, organizations can take a substantial leap in informed decision-making.

Robust report generation with LLM-driven automation:

Conventional reporting, which once demanded increased workforce and time, has now been simplified by LLMs. Their transformative power is evident in automated analytics and enhanced visualization, leading to comprehensive reports being delivered in a fraction of the time. For instance, companies like Tableau have effectively simplified reporting by leveraging LLMs that automate analytics and documentation, supported by superior visualization capabilities. The add-on also makes accessing and understanding reports easier for non-technical users.

Enriching the semantic layer with Metadata enhancement:

Organizations pioneering data strategies must be mindful of creating a resilient semantic layer. They must take cues from **ChatGPT, Bard, and LLaMA,** and note that the richness and volume of their corporate data will be a critical component of their metadata, ultimately ensuring precision in contextual insights. LLMs can adeptly analyze and comprehend existing and external data sources. They can also use such sources to generate supplementary metadata encompassing descriptions, relationships, or contextual information in a natural language format.

Though many enterprises have already started implementing innovation strategies in this field, others are still trying to ascertain how such technologies might benefit them. Viewing GenAI as a growth catalyst might help them create the desired business impact.

Towards a future-ready data ecosystem

As industries progress toward human-centric operations, GenAI and LLM will continue to play pivotal roles in how businesses function. Enterprises ready to integrate these technologies into their strategic imperatives should inquire with vendors about the following aspects – the specific capabilities they provide, the functioning of these capabilities, the integration process, and the available pricing options.

With such advancements, business leaders can effectively derive context-sensitive information via user-friendly interfaces and elevate organizational decision-making capabilities. Intelligent information extraction and enrichment will pave the way for resilient and thriving data ecosystems, enabling industry-wide long-term growth.

About the Author

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Nilesh is a hands-on technologist and strategic visionary with focus on building, modernizing, managing enterprise level modern data architectures and Data Consumption program.

He posses specialized skills on Data Analytics, Data Lake, Data management, Azure, AWS Cloud with proven technical, solution architecture, strategic experience with large global Financial and Manufacturing industries.

Infosys Topaz is an AI-first set of services, solutions and platforms using generative AI technologies. It amplifies the potential of humans, enterprises and communities to create value. With 12,000+ AI use cases, 150+ pre-trained AI models, 10+ AI platforms steered by AI-first specialists and data strategists, and a 'responsible by design' approach, Infosys Topaz helps enterprises accelerate growth, unlock efficiencies at scale and build connected ecosystems.

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