AI Design Patterns for Generative AI and Augmented Analytics and BI

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Data and analytics leaders struggle to leverage generative AI in their analytics and business intelligence platforms and data ecosystems. These slides provide architecture guidance on design patterns to implement generative AI alongside or within augmented ABI platforms.

Overview

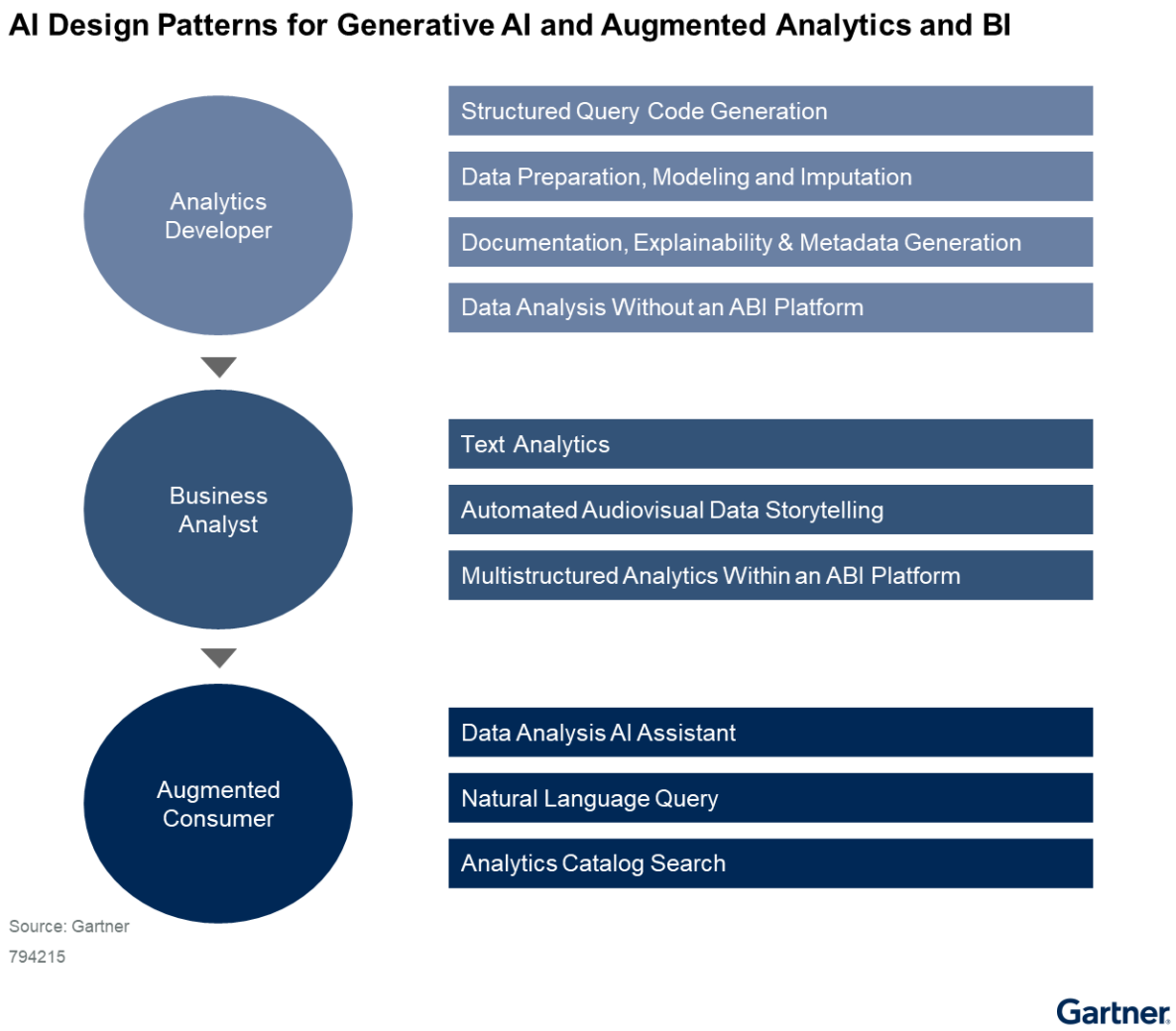
Design patterns are reusable solutions to common AI and software design problems. They are not specific to a particular use case, but rather provide a set of repeatable approaches, principles and architectural blueprints that can be applied in diverse use cases. Design patterns help improve the quality, maintainability, consistency and extensibility of software systems.

This presentation contains 10 key design patterns to implement augmented analytics and business intelligence (ABI)-integrated generative AI (GenAI) capabilities. It should be used to facilitate ideation and to rightsize investment based on the design pattern's complexity and value.

The popularity of ChatGPT has opened the floodgates of innovation in GenAI in the augmented ABI space. However, data and analytics (D&A) leaders struggle in understanding how to best include enterprise GenAI capabilities in their modern data stack, data pipelines and analytics workflows, which limits the business value they could obtain from these technologies.

Each pattern in the presentation includes high-level design illustrations, a description, benefits, drawbacks and use cases. Download the slide deck to view the patterns and explore how they could be used across enterprise solutions. See Figure 1 for all of the design patterns and associated user personas.

Figure 1. AI Design Patterns for Generative AI and Augmented Analytics and BI



User personas align with use cases in the Critical Capabilities for Analytics and Business Intelligence Platforms, including:

- **Analytics developer,** which describes the ability for an analytics developer to build and distribute analytics content to a large community of analytic consumers across the enterprise.
- **Business analyst,** who supports the business analyst's ability to blend disparate data together for visual analysis with little help required of IT.
- **Augmented consumer** is for organizations that want to focus on the consumer of analytic content, making it easy to find and understand various forms of analytic content.

Several GenAI deployment options (see How to Choose an Approach for Deploying Generative AI) for ABI platforms are emerging that address consideration of data privacy, security and protection, solution structure, implementation, architecture, and the benefits and drawbacks of these. These options include choosing to:

- **Consume** (SaaS application or API)
- **Embed** (SaaS or PaaS)
- **Extend** (retrieval augmented generation or fine-tuning), and
- **Build** (a custom foundation model)

Organizations are racing to implement GenAI models, including applications like ChatGPT. While 9% have already deployed, one-third of CIOs and technology executives state that they will deploy generative AI technologies in the next 12 months, according to the 2024 Gartner CIO and Technology Executive Survey. [1] The AI design patterns presented here give immediate guidance to organizations to execute on short-term opportunities and reuse common patterns, and provide a target state for more complex implementations.

Analytics and BI platforms have been a leading software category in implementing AI, which means that generative AI is just the latest development in a long line of innovations. Augmented Analytics and BI (ABI) platforms are well complemented by GenAI-based solutions. They provide guardrails around creative suggestions (hallucinations) where high thresholds of accuracy and correctness need to be attained for reporting of quantitative data.

Gartner predicts that by 2026, more than 70% of independent software vendors (ISVs) will have embedded, generative AI capabilities in their enterprise applications, which is a major increase from fewer than 1% today. Natural language query and conversational AI interfaces are disruptive to established patterns of turning data into insights — visual point-and-click user experiences — with emerging workflows and multiexperience user interfaces. As such, these generative AI design patterns are enabling platform buyers to reduce technical debt in organizations where multiple enterprise standards for their ABI platform is typical.

Moving from prototypes to production deployments requires collaboration between D&A, software engineering and border IT team. Gartner predicts that by 2026, more than 80% of enterprises will have used generative, artificial intelligence (AI) APIs, models and/or deployed generative, AI-enabled applications in production environments, which is a significant increase from fewer than 5% today. Therefore, organizations should reuse these design patterns as they plan and design their GenAI implementations for their augmented and generative analytics experience.

D&A leaders and teams may not be responsible for designing and building these patterns. In many cases, it will be the technology software and service providers doing so within their solutions for their clients. It is useful for D&A leaders to understand these patterns and that there are deeper engineering and software design challenges and constraints that vendors will assist in addressing.

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3 Steps to Scale Analytics Adoption Through Automation and Augmentation

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ChatGPT Research Highlights

Data and Analytics Essentials: Gartner Analytics Atlas

Acronym Key and Glossary Terms

ABI	Analytics and business intelligence
API	Application programming interface
AI	Artificial intelligence
LLM	Large language model
NLG	Natural language generation
TTS	Text-to-speech

Evidence

[1] **2024 Gartner CIO and Technology Executive Survey** This survey was conducted online from 2 May to 27 June 2023. to help CIOs determine how to distribute digital leadership across the enterprise and to identify trends in IT investments.Qualified respondents were drawn from Gartner Executive Programs members and other CIOs and technology executives. The total sample is 2,457 respondents, with representation from all geographies and industry sectors (public and private). *Disclaimer: Results of this survey do not represent global findings or the market as a whole, but reflect the sentiments of the respondents and companies surveyed.*

Results indicate that 9% have already deployed generative AI. One-third of respondents stated that they will deploy generative AI technology within the next 12 months and only 3% of CIO and technology executives stated that they had no interest in generative AI deployment.