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USING GENAI TO TRANSFORM DIGITAL PRODUCT DEVELOPMENT AND DIGITAL SALES IN THE BANKING SECTOR

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Abstract
The article examines the problems and strategic applications of using Generative Artificial Intellegence (GenAI) in order to transform the development of digital products and digital sales in the banking sector. The intensive development of GenAI creates unprecedented opportunities for the transformation of this sector. The relevance of the research is due to the need to rethink traditional approaches in the context of digitalization. There are contradictions regarding the optimal pace of GenAI implementation: a number of researchers call for aggressive digital innovations, while others point to the need for a gradual transition based on financial institutions' readiness and the maturity of the technologies themselves. The aim is to analyze the key areas of application of GenAI in the characterized area. The article systematizes the elements of the conceptual framework and the advantages of using generative artificial intelligence. The study proposes a novel strategic framework for assessing GenAI's impact and applications across key areas within the banking sector. Special attention is given to how GenAI affects the process of digital product development of financial products and its potential applications in digital sales, particularly through customer engagement, hyper-personalized communication, and chatbots. As a result of the study, it was found that the introduction of GenAI in the banking sector can significantly reduce the time to bring new products to market, enhance personalization in customer interactions, and drive revenue growth through innovative cross-selling strategies. The articles' materials are of practical value for the heads of commercial and retail banks, specialists in digital transformation, and researchers in the field of financial technologies.

Keywords Generative artificial intelligence (GenAI), digital product development, digital sales acceleration, banking industry transformation, digital transformation, customer engagement, cross-sell, hyper-personalization, chatbots, advanced analytics, financial technology.

INTRODUCTION

Generative Artificial Intelligence (GenAI) is fundamentally transforming the operations of the banking industry, offering unprecedented opportunities to redefine traditional approaches to product development, customer interactions, and the delivery of financial services. According to the McKinsey Global Institute, the banking sector stands out among various industries with one of the largest opportunities to generate additional value from GenAI, estimated at $200 billion to $340 billion annually—driven primarily by application in software engineering (digital product development), retail banking and corporate banking [1, 2]. Consequently, there is a growing academic interest in analyzing key areas where GenAI technology is applied in this sector and examining its potential for the industry's transformation.

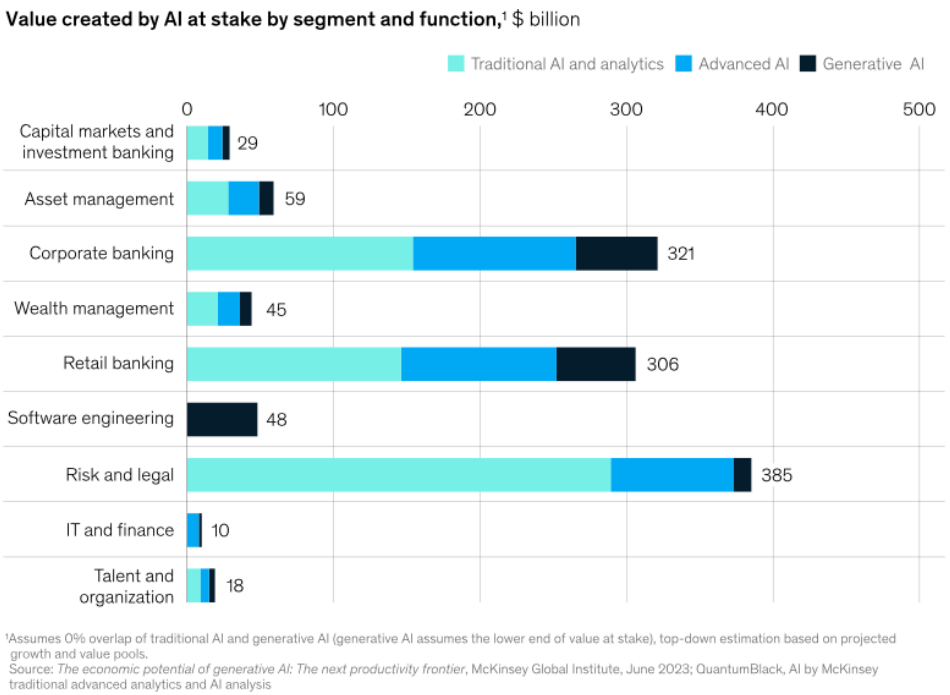

Figure 1. Value created by AI at stake by segment and function in the banking industry [2]

Companies, including banks, have already begun capturing value from generative AI, reflecting its transformative potential across industries. Recent empirical analysis indicates a significant increase in GenAI adoption, with 65% of surveyed organizations now reporting regular use—double the rate observed in the previous year [3]. This trend is particularly pronounced in the financial sector, where banks are actively exploring and experimenting with generative AI, underscoring its growing appeal and adaptability to a wide range of business processes.

Despite this progress, banks continue to face challenges in meeting the evolving expectations of their customers. The research problem lies in the fact that existing methods of digital banking services and sales do not fully address modern demands for personalization, speed, and service quality. As the banking sector undergoes a rapid digital transformation, the development of digital products has become a critical focus area. However, because digital product development is not traditionally a core competency for most banks, their methodologies are often outdated and lack agility. Digital tools, such as chatbots for customer interaction, often require lengthy development cycles before being introduced to the market and frequently demonstrate limited efficiency in practice. Moreover, traditional sales and service channels, such as bank branches and call centers, require significant operational costs and do not provide 24/7 service availability. This research aims to explore the potential of generative artificial intelligence to overcome these challenges and to transform processes related to digital product development and digital sales, as well as propose an innovative framework for identifying and prioritizing key applications of GenAI within these areas.

Current Scholarly Perspective

The preparation of this article involved comparative analysis, systematization, synthesis, and generalization, with a focus on reviewing recent scholarly works on the topic.

In the literature, various aspects of applying generative artificial intelligence in the banking sector are actively explored. For instance, J. Bellens and T. Mogi [4] highlight key priorities for the successful implementation of GenAI in this sector, emphasizing the need for a systematic approach to transforming business processes. Expanding on this idea, U. Noreen and co-authors [9] present the concept of Banking 4.0, where AI serves as a central element in the technological evolution of commercial banking services.

Of particular interest are studies on user acceptance of new AI developments. S.S. Bharti and colleagues [5] utilize the PLS-SEM method to analyze factors influencing customer perceptions of AI technologies in digital banking. Ja.N. Sheth and co-authors [12] focus on the potential for AI-driven service personalization in emerging markets, proposing a comprehensive model for experience assessment.

In more specialized areas, Ch. Dietzmann and colleagues [6] investigate the potential of robotic advisors, while S. Dimitrieska [7] examines the possibilities of generative AI in banking advertising and marketing communications.

Regional aspects of GenAI integration are analyzed by T. Maheswari and colleagues [8] through case studies, and by M. Sharma [10], who explores the specifics of AI adoption in the banking sector in the Middle East.

Contemporary research publications reveal differing perspectives on the optimal pace of GenAI technology integration: some researchers [4, 11, 13] advocate for rapid, large-scale transformation, whereas others [5, 12] emphasize the importance of a gradual transition in line with customer readiness.

Several aspects remain insufficiently covered, such as methodologies for evaluating the effectiveness of GenAI solutions in banking, issues of ethics and transparency in AI-driven decision-making, the long-term socioeconomic impacts of widespread AI adoption in banking, and challenges related to data security and privacy in implementing these innovations. Further, detailed research is necessary to fill these gaps and provide a comprehensive understanding of GenAI's role in transforming the banking sector.

Theoretical foundation of GenAI integration into business workflows

The integration of Generative Artificial Intelligence (GenAI) into business and technological workflows is grounded in the principles of foundation models and transformer architectures. GenAI is characterized by its ability to create unstructured content, such as text, images, and videos, through models trained on extensive datasets across various domains. This versatility enables it to be adapted to diverse tasks, transcending the limitations of traditional AI systems that were predominantly designed for structured data interpretation and limited applications. (Fig. 2)

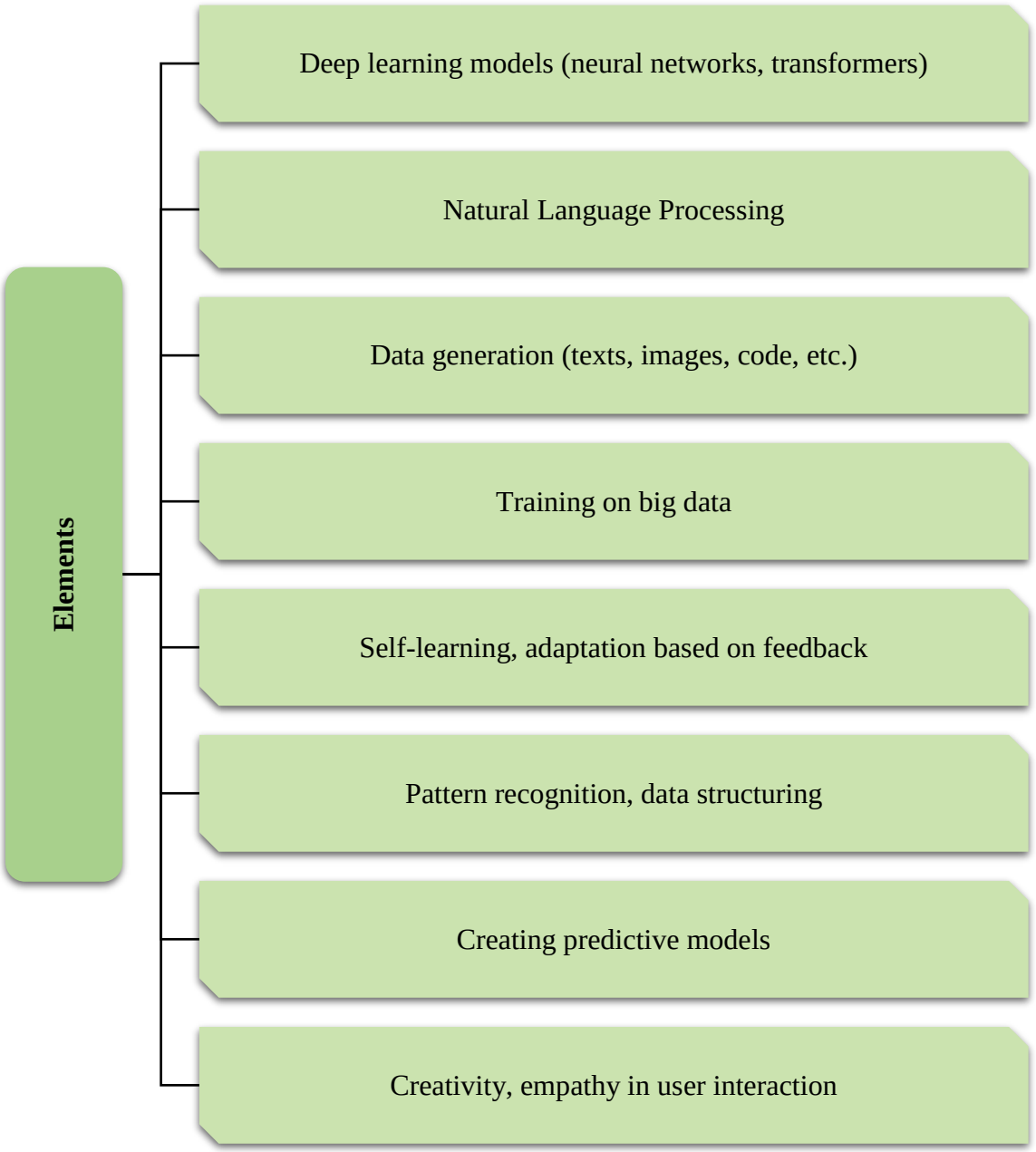

Figure 2. Elements of the GenAI conceptual framework [4, 7, 13, 14, 17]

Foundation models, which form the core of GenAI systems, utilize vast datasets encompassing internet crawls, literary repositories, and domain-specific corpora. For example, the training dataset for GPT-3 consisted of 45 terabytes of data, including over 250,000 books, Wikipedia, and Web content. The underlying architecture leverages transformer models with billions of parameters (e.g., GPT-4 with 175 billion parameters), trained using attention mechanisms to predict sequential data patterns [18]. This training process, equivalent to decades of computation on singular GPU systems, results in a generalized model capable of diverse text-generation tasks, such as writing articles, code generation, and emotional sentiment analysis.

What distinguishes GenAI from traditional AI paradigms is its capacity to generate novel outputs while simultaneously excelling at interpreting unstructured data. By enabling better data labeling and context understanding, GenAI facilitates more efficient workflows. Furthermore, its integration within industry-specific processes allows for reimagined end-to-end operations, moving beyond fragmented point solutions to holistic automation.

By integrating these capabilities, GenAI not only automates isolated processes but also drives systemic efficiency and innovation across industries. Its theoretical foundation, rooted in foundational modeling and advanced data training methodologies, provides the basis for its expansive adaptability and transformative potential.

GenAI impact on Digital Product development and Digital Sales within the banking sector

Generative AI has the potential to revolutionize the entire digital product development lifecycle (PDLC) within the banking sector, addressing critical challenges in efficiency, agility, and customer-centric innovation. By integrating generative AI across all stages of the PDLC (ideation, development, deployment), banks can overcome the limitations of traditional development methods, accelerate timelines, and create superior digital solutions tailored to evolving customer needs [2]. As banks increasingly digitize their operations, generative AI offers a transformative pathway to modernize their approaches and drive value creation in a highly competitive and regulated industry.

In the ideation phase, generative AI can enhance the breadth and depth of idea generation by analyzing customer behavior, market trends, and operational data to identify unmet needs and emerging opportunities. For example, banks can leverage AI to design personalized financial products, such as dynamic savings plans or tailored lending solutions, by converting raw data into actionable user stories. Furthermore, generative AI can streamline the creation of requirements, translating abstract business goals into detailed functional specifications. This accelerates the validation of ideas and ensures alignment with customer expectations while reducing the time required to move from concept to execution.

In the development phase, generative AI transforms how banks approach coding, testing, and system design. AI can assist in the automated generation of secure and context-aware code based on predefined requirements, ensuring compliance with regulatory standards and industry best practices. Additionally, generative AI can optimize testing processes by identifying potential vulnerabilities, generating test cases, and adapting to iterative changes in requirements. This capability is especially valuable in the banking sector, where robust testing is critical to maintaining the reliability and security of systems that handle sensitive financial transactions. Generative AI also enables more adaptive and efficient system architecture, automatically adjusting to new business needs and regulatory changes, further enhancing development agility.

The application of GenAI is particularly transformative in the domain of digital sales [4], where effective communication and tailored recommendations are critical. This technology offers a transformative approach to customer engagement, enabling high levels of personalization and interaction that surpass the limitations of traditional methods. Particularly, GenAI allows banks to transition from segmented approaches to individualized, real-time interactions at scale.

The evolution of personalization in banking can be conceptualized as a progression through several stages. Initially, banks lacked any form of personalization, delivering uniform

communications to all customers irrespective of their unique needs or preferences. Over time, simple personalization emerged, incorporating basic data elements such as customer names or account details into messages. This approach subsequently evolved into segment-driven personalization, wherein customers were grouped based on broad demographic or behavioral characteristics, and communications were tailored accordingly. While these approaches provided incremental improvements, they were inherently limited in their ability to address the nuanced preferences of individual customers.

GenAI marks a significant advancement in personalization by enabling hyper-personalized, one-to-one interactions at scale. Unlike traditional methods that rely on static templates, GenAI dynamically generates bespoke communications, adapting content, tone, and delivery channels to align with the specific preferences and behaviors of each customer. For example, generative AI can analyze customer financial histories and behavioral patterns to craft tailored product recommendations, such as personalized credit card offers or investment advice [6]. This capability moves beyond mass segmentation, delivering communications that resonate with individual customers on a granular level.

In addition to personalized communication, GenAI impacts the area of after-sales service, where its capabilities significantly outperform traditional call centers. GeaAI-powered virtual assistant can instantly process requests without creating queues and operate around the clock, maintaining consistently high-quality service (regardless of time, system load, or other factors). Additionally, a single virtual assistant can simultaneously serve thousands of clients, offering each one personalized attention and maintaining the dialogue context. GenAI bots manage a wide range of tasks (Fig. 3). By analyzing customer data in real-time, these systems can identify relevant cross-selling opportunities, offering personalized product or service recommendations that align with customer needs and behaviors. Such advancements not only strengthen customer satisfaction and loyalty by ensuring prompt and tailored interactions at every touchpoint but also create new avenues for revenue generation through targeted cross-sell initiatives.

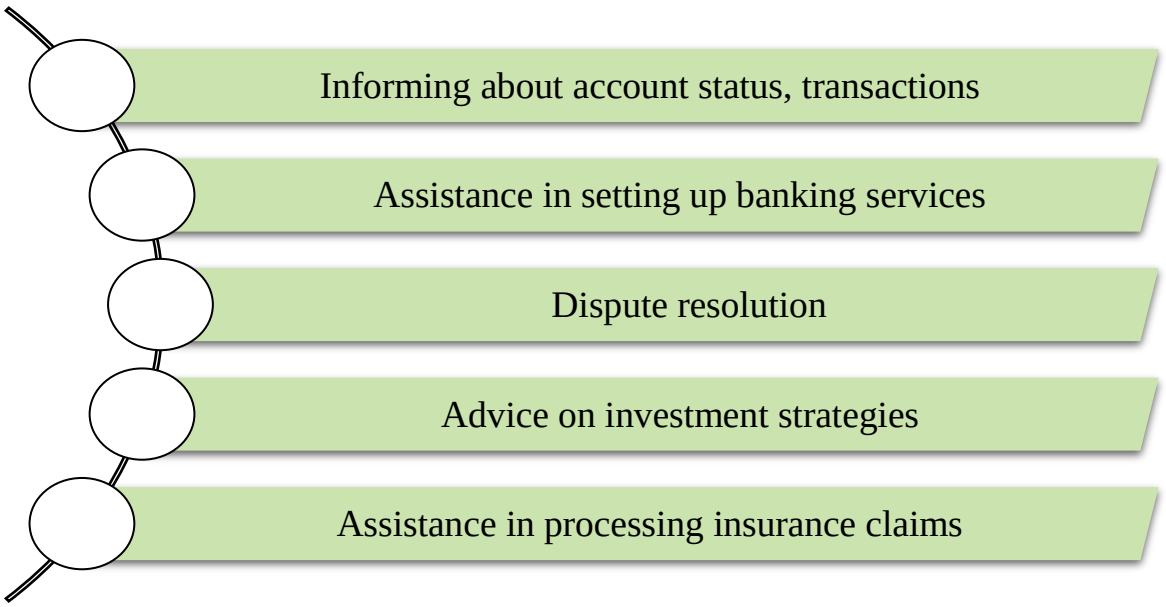

Figure 3. Multitasking of GenAI bots [10, 12, 15, 16]

At its most sophisticated stage, GenAI enables end-to-end personalized conversational experiences across multiple digital channels. Customers can initiate and seamlessly continue interactions through mediums such as chat, email, or voice, with GenAI responding in real time to provide contextual, human-like engagements. For instance, a customer inquiring about recent transactions might receive a detailed response accompanied by tailored suggestions for relevant financial products or services, such as savings plans or investment options. This transition from static, transactional exchanges to dynamic, responsive conversations fosters deeper customer engagement and builds trust.

Impact assessment framework and strategic implications for banks

Table 1 provides a comprehensive framework and original perspective for analyzing the transformative impact of GenAI across critical stages of digital product development and digital sales within the banking sector. Developed through original analysis and enriched by review of existing scientific publications [1, 4, 6, 7, 11], it systematically categorizes key applications of GenAI alongside their respective impacts, offering a structured and data-driven perspective on how this technology can address prevailing inefficiencies, enhance customer engagement, and foster innovation.

The framework delineates specific use cases across ideation, development, deployment, sales, and customer service, illustrating how GenAI can optimize processes such as automated requirement drafting, hyper-personalized customer interactions, and real-time operational monitoring. Furthermore, it identifies the tangible outcomes of these applications, including enhanced product quality, increased customer satisfaction, operational efficiency, and revenue growth through targeted cross-selling. This framework not only underscores the strategic potential of GenAI in banking but also provides a foundation for future research and implementation strategies aimed at leveraging its capabilities to meet evolving industry demands.

Table 1. Framework for defining core applications and impact across critical stages of digital product development and digital sales.

Domain	Category	GenAI Core Applications	Impact
Digital Product Development	Ideation and Requirements	Analyze customer and market data to identify unmet needs.	Faster product innovation.
		Draft detailed user stories and requirements automatically.	Improved alignment with customer needs.
		Validate ideas faster through predictive customer scenarios.	Reduced time to validate product ideas.
	Development and Testing	Generate secure, compliant, and context-aware code.	Enhanced product quality.

		Automate test creation and vulnerability detection.	Reduced development time and cost.
		Optimize system architecture dynamically for evolving needs.	Improved agility in adapting to requirements.
	Deployment and Monitoring	Predict and resolve operational issues proactively.	Improved system reliability.
		Analyze feedback to introduce updates and optimizations.	Increased operational efficiency.
		Streamline deployment processes with real-time insights.	Faster and more efficient product deployment.
Digital Sales	Hyper-Personalization in Sales	Generate dynamic, individualized communications.	Higher engagement and sales conversion rates.
		Provide real-time, contextual interactions across channels.	Improved customer satisfaction and loyalty.
		Recommend products using behavioral and financial data to enhance cross-selling.	Increased revenue through targeted cross-selling.
	After-Sales Service	Deliver scalable, 24/7 virtual assistance with personalized responses.	Enhanced customer support experience.
		Maintain consistent service quality regardless of demand.	Increased retention and customer trust.
		Identify cross-selling opportunities during customer interactions.	Boosted revenue through personalized recommendations.

GenAI offers banks a transformative opportunity to modernize their product development processes, addressing longstanding inefficiencies and aligning with the demands of the digital era. Historically, banks have relied on rigid, resource-intensive development methodologies that need help to keep pace with rapidly changing customer expectations. GenAI introduces flexibility and efficiency into the PDLC, enabling banks to significantly accelerate the development of digital products and time to market.

The application of GenAI in digital sales and customer engagement carries profound strategic implications for the banking sector. By delivering

hyper-personalized, real-time interactions, GenAI not only enhances customer satisfaction but also drives higher engagement and loyalty. Furthermore, its ability to combine digital sales and after-sales services into a seamless, AI-driven continuum positions banks as trusted financial partners rather than mere transactional service providers. This shift not only improves the overall customer experience but also enables banks to capitalize on more effective cross-selling and up-selling opportunities within their digital ecosystems.

The potential applications of GenAI in the banking sector remain vast. While one of the largest strategic impacts of GenAI in banking is anticipated in digital product development and digital sales, its broader implications extend to key areas such as operations, compliance, and talent management. By automating complex workflows, enhancing fraud detection and risk monitoring, and streamlining workforce optimization, GenAI equips banks to achieve greater operational efficiency, strengthen regulatory compliance, and improve organizational agility. These applications not only address current challenges but also position banks to innovate and adapt in a rapidly evolving market, ensuring sustained competitiveness and long-term strategic resilience.

CONCLUSIONS

GenAI represents a transformative opportunity for the banking sector, addressing critical inefficiencies and enabling innovation in a highly competitive and regulated industry. By leveraging GenAI, banks can enhance agility, streamline operations, and deliver superior customer experiences. Its applications span multiple domains, with some of the most impactful ones being digital product development and digital sales.

In the domain of digital product development, GenAI revolutionizes the product development lifecycle (PDLC) by enabling faster, more efficient processes at every stage, from ideation to deployment. During prototype creation and product backlog planning, the tools optimize ideas and prioritize tasks, focusing on the key features most important to clients. In the development phase, GenAI reduces the workload on developers, accelerating coding and testing, which helps shorten the time to market. Ultimately, this results in a smoother and more successful product launch, backed by valuable data-driven recommendations.

In digital sales, GenAI drives hyper-personalization, transforming customer engagement and communication strategies. By transitioning from segmented messaging to individualized, real-time interactions, GenAI fosters deeper customer connections and enhances satisfaction. Its ability to analyze customer behavior and financial patterns allows for tailored product recommendations, increasing both engagement and sales conversion rates. Additionally, GenAI's role in after-sales service ensures 24/7 availability, personalized assistance, and cross-selling opportunities, further strengthening customer loyalty and driving revenue growth.

In summary, it is crucial to emphasize that GenAI enables banks to make the product development and digital sales processes more targeted, agile, and data-driven, thereby strengthening their competitive position in a rapidly changing environment. Achieving its full potential requires both technological readiness and a fundamental transformation of business processes within banks, enabling a new standard of service excellence.

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