Commercialization of Generative Artificial Intelligence in E-Business

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***Abstract* - This paper examines the key aspects of the commercialization of generative artificial intelligence (Gen AI) in the e-business domain. The focus is on distinguishing between three primary commercial models: Business-to-Consumer (B2C), Business-to-Business (B2B), and Business-to-Government (B2G), which differ from one another in terms of target audience, application, technical requirements, and monetization strategies. While B2C solutions are focused on mass accessibility, personalization, and user experience, B2B systems require deep integration with business processes, along with a high level of scalability and security. The B2G model addresses the improvement of public services, but it also raises specific ethical and regulatory questions. The paper also highlights that the development and application of Gen AI are outpacing the response of the scientific community and regulators, creating a need for more intensive collaboration between industry, science, and policymakers to ensure the responsible and sustainable application of this transformative technology.**

Keywords: Generative Artificial Intelligence, commercialization, e-business, B2B, B2C, B2G, business models

I. Introduction

Generative Artificial Intelligence (Gen AI) represents a significant leap in the evolution of artificial intelligence, enabling the creation of entirely new content, including text, images, audio, and software code [1]. Unlike traditional AI systems, which rely on analyzing existing data, Gen AI has the transformative potential to reshape the way businesses are conducted fundamentally [2]. The rise of this technology, accelerated by the breakthrough of tools like ChatGPT, Gemini, and others after 2022, has led to its widespread adoption and public awareness of its capabilities [3].

The commercial use of Gen AI can be observed through personal and individual applications, as well as three distinct commercial models, each with unique characteristics and objectives (Fig. 1). Understanding the process of commercializing Gen AI is crucial for successful implementation in the modern business environment, as it necessitates a comprehensive analysis of its applications in both private and commercial contexts.

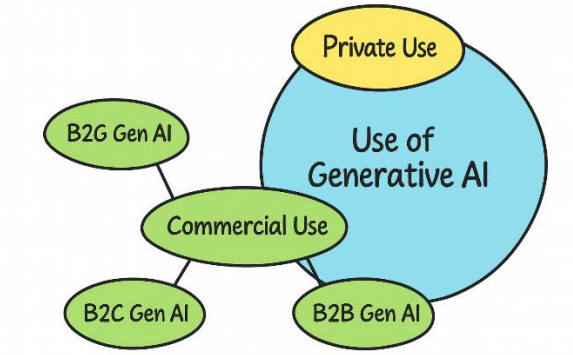

Fig. 1. Applications of Generative AI: Private Use, B2C, B2B & B2G

Personal/Individual Use of Gen AI finds application in generating content for social media, creating unique images for personal projects, writing creative texts, composing simple music, creating personal avatars and filters, generating responses for online communication, language learning through interactive conversations, creating personalized educational materials, recipe generation based on available ingredients, travel planning, interior design assistance, and generating ideas for gifts and entertainment.

This paper aims to analyze the process of commercializing Gen AI, with special focus on three key commercial models: B2C, B2B, and B2G, while clearly distinguishing them from personal use applications.

II. Commercialization Models of Gen AI

The commercial use of generative AI can be observed through three main distinct forms, each with unique characteristics and objectives: B2C, B2B, and B2G Gen AI models.

A. *Business-to-Consumer (B2C) Gen AI*

Gen AI tools, such as ChatGPT, Gemini, Claude, etc., intended for the general public, are distinguished by their intuitive user interfaces, which allow even less technically experienced individuals to generate content. The main points are personalization, entertainment, creativity, and enhancing personal productivity [2]. Monetization is most often achieved through *freemium* models, monthly subscriptions, or pay-per-use models.

The design of these tools prioritizes the user experience, effectively hiding complex technical details. The focus has shifted from a complex interface to simplicity and intuitiveness, making them similar to everyday applications. Complex processes, including natural language processing, model training, and token handling, occur seamlessly in the background [1].

Thanks to such user-oriented interfaces, generative AI tools become usable even for individuals without prior knowledge of programming, statistics, or machine learning. This significantly expands the circle of potential users, who can now experiment and leverage the benefits of these technologies without needing technical expertise. Additionally, the linguistic accessibility of the tools, which support most world languages, contributes to their inclusivity and global availability [3].

A crucial distinction must be made between the private, non-commercial use of generative AI and its formal B2C applications. Although the line can sometimes be thin and overlapping, there are fundamental differences in motivation, scope, potential impact, and responsibility.

Monetization is most often achieved through freemium models, monthly subscriptions, or pay-per-use models.

How to separate private from B2C applications of Generative AI for the general public:

By focusing on the following key aspects:

Who is the leading actor, and what is their motivation?

- **Individual/personal use:** An individual user utilizes the tool for personal needs (entertainment, learning, creativity, organization), without the direct intention of profiting or providing services to others. The motivation is personal.
- **B2C use:** A business (company, organization) offers a tool or service directly to consumers. The motivation is usually commercial (revenue, users, brand).

What is the primary goal of using the tool?

- **Individual/personal use:** Personal benefit (e.g., a greeting card, a poem, an image for a non-monetized blog).
- **B2C use:** Providing value to consumers through a product or service (e.g., personalized recommendations, customer support, on-demand content creation).

What is the nature of the interaction with the tool?

- **Individual/personal use:** Direct interaction of the user with the tool.
- **B2C use:** Interaction of the user with a platform or service in which AI is integrated.

Is there a commercial aspect or an exchange of value?

- **Individual/personal use:** There is usually no direct commercial gain from the generated content (except for possible later commercialization).
- **B2C use:** Companies directly earn money or build long-term relationships with users through these tools (payment for services, advertising).

Illustrative examples:

Individual/personal use:

- An individual uses a free online tool to generate a desktop wallpaper.
- A person uses an AI application to write poetry for personal use.
- A student uses a text summarization tool to understand a scientific paper.

B2C use:

- A company offers a subscription to generate professional marketing texts.
- A social network has a feature for generating photo descriptions.
- An e-learning platform uses AI for personalized quizzes.

Finally, it is essential to emphasize that the use of generative artificial intelligence carries a series of potential risks that must be considered, and these risks differ significantly between private users and B2C applications.

Separating private from B2C use is essential for several reasons, especially when considering the misuse of Gen AI:

- **Responsibility:** In B2C scenarios, companies bear greater responsibility for potential misuse by users.
- **Regulation:** Commercial applications of Gen AI may be subject to various laws and regulations.
- **Scale of Impact:** B2C applications have a greater potential reach and impact.
- **Ethical Considerations:** Commercial use raises specific ethical questions (transparency, bias, data protection, manipulation).

Therefore, although an individual user may use a similar tool as a B2C service, the context, motivation, and actors are key to differentiation. Clearly defining these categories enables a more precise analysis of specific forms of misuse and their benefits.

Generative AI tools for the general public are used to generate content for social media, create unique images for personal projects, write creative texts, compose simple music, and develop short video clips. The quality and relevance of the output from these models significantly depend on the user's queries, which emphasizes the importance of prompt engineering in effectively guiding the AI toward the desired results [4].

The applications and impact of these generative AI tools for end-users are vast and constantly growing. ChatGPT is used for content creation, writing assistance, summarizing information, translation, and coding help [5]. Image generation tools like DALL·E, Midjourney, and Stable Diffusion allow for the easy creation of digital art, illustrations, designs, product mockups, marketing visuals, and educational materials. The emergence of multimodal applications, such as GPT-4 series and Gemini Pro, Claude Sonnet 4 further expands possibilities through the integration of text, sound, images, and video, improving customer support, content creation, education, and accessibility.

The accessibility and ease of use of these tools have been key to their rapid adoption in various fields. They have empowered individuals to express creativity, learn, and improve productivity in new ways. Continuous progress in the underlying technologies promises even more sophisticated and transformative applications in the future.

B. Business-to-Business (B2B) Gen AI

In the business environment, Gen AI is applied to enhance internal processes, boost efficiency, and accelerate innovation. These solutions are often integrated into existing business systems (CRM, ERP) and are tailored to specific industry needs. Key requirements are scalability, security, and regulatory compliance, while business models include licenses, subscriptions, and custom corporate contracts.

Beyond the domain of tools for end-users, a significant aspect of the commercialization of generative artificial intelligence is reflected in specialized solutions for business-to-business (B2B) use, tailored to the unique needs and challenges of various industries [6]. Businesses have access to a diverse range of platforms and application programming interfaces (APIs) that enable the integration of generative AI capabilities into their existing workflows and applications [7]. This integration often involves the implementation of sophisticated Gen AI agents – intelligent software entities designed to autonomously perform specific tasks such as content generation, data analysis, or process automation within a business environment [8].

The target audience for general-purpose generative artificial intelligence tools is broad, encompassing individuals seeking creative inspiration, students requiring assistance with writing assignments, and professionals aiming to boost their productivity. This wide range of users reflects the comprehensive application and democratization of advanced AI capabilities. These tools often use freemium or subscription models to cater to a large and diverse user base. On the other hand, specialized B2B generative artificial intelligence solutions are primarily aimed at businesses and organizations within specific industries, as well as researchers and experts seeking advanced AI capabilities to solve complex challenges in their fields. These solutions often include the implementation of Gen AI agents tailored to their specific needs [9]. The adoption of these tools unlocks the potential for significant business impact and a measurable return on investment [10].

Some of the examples the thematic areas of generative AI application in modern business are shown on Fig. 2.

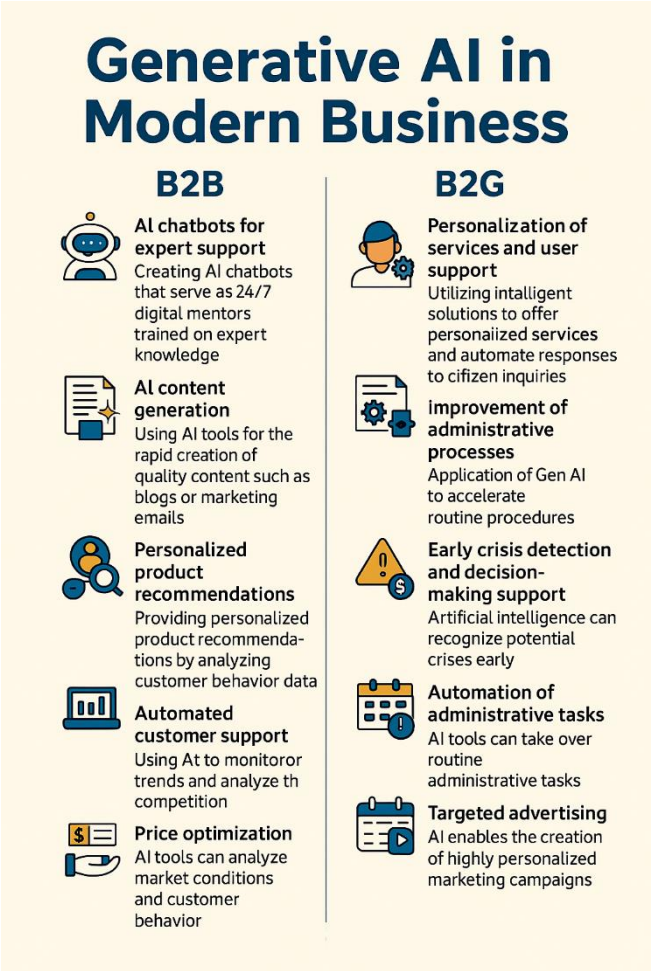

Fig. 2. Generative AI application in modern business

This wide array of examples demonstrates that the role of Generative AI in the B2B sector extends far beyond simple task automation. It positions itself as a strategic partner capable of enhancing core business functions—from operational efficiency and data-driven decision-making to customer engagement and innovation. Unlike the B2C model, which focuses on direct user experience, B2B solutions are fundamentally about creating measurable business value, integrating deeply into existing workflows, and providing a tangible return on investment

C. Business-to-Government (B2G) Gen AI

Public institutions are increasingly recognizing the potential of generative artificial intelligence to improve their services and interactions with citizens. The implementation of Gen AI in the public sector brings numerous advantages:

- **Personalization of services and user support:** By utilizing intelligent solutions, institutions can offer personalized services, automate responses to citizen inquiries, and streamline processes such as completing electronic forms, which contributes to increased user satisfaction.
- **Improvement of administrative processes:** The application of Gen AI allows for the acceleration of routine procedures based on objective facts, such as processing citizen requests based on submitted documentation or data from registers.

- **Early crisis detection and decision-making support:** Artificial intelligence can help public administration to recognize potential crises early by analyzing large datasets, enabling timely reactions and informed decision-making.

However, despite these advantages, there are challenges related to implementing Gen AI in the public sector, including issues of data privacy, algorithm transparency, and the need for clear usage guidelines. Therefore, it is necessary to develop strategies that will ensure the responsible and ethical use of this technology in the service of citizens.

It is important to emphasize that these AI tools are not reserved only for large corporations; small and medium-sized enterprises, as well as entrepreneurs, can use them effectively to improve their operations and increase revenue.

III. Key Differences in the Application of Gen AI Models

Although they rely on similar technologies, the B2B, B2C, and B2G models differ significantly in terms of target audience, purpose, procurement process, and technical requirements. Table 1 provides a comparative overview of these differences.

TABLE I. KEY DIFFERENCES IN THE APPLICATION OF GEN AI IN B2B, B2C, AND B2G GEN AI MODELS

Criterion	Gen AI Business Models		
	B2B – Business to Business	***B2C – Business to Consumer***	***B2G – Business to Government***
Target Audience	Companies, teams, professionals	End-users, individual consumers	Government institutions, public agencies
Purpose of Gen AI Use	Process optimization, analytics, automation	Personalization, entertainment, creation, learning	Efficiency of public services, data analysis
Purchasing Process	Lengthy, consultative, with technical evaluation	Fast, often emotional, via digital channels	Complex, through public procurement, requires compliance
Monetization Models	Subscriptions, API models, and custom contracts	Freemium, monthly subscriptions, pay-per-use	Fixed-budget contracts, tenders
Technical Requirements	Scalability, integration with ERP/CRM, security	Simplicity, mobile accessibility, and UX design	Legal compliance, high level of security

Understanding these differences is crucial for selecting the right strategy for developing and commercializing Gen AI solutions, as successfully adapting to the specifics of each model provides a clear competitive advantage.

IV. Regulatory and Ethical Challenges

The commercialization of Gen AI technology is not merely a technical or business challenge; it is fraught with complex regulatory and ethical issues [11,12]. These challenges are not monolithic. Instead, they manifest differently across the B2C, B2B, and B2G models, each presenting a unique risk profile that demands a tailored governance approach. A one-size-fits-all regulatory framework is insufficient for addressing the distinct implications of Gen AI in these varied contexts.

A. Challenges in the B2C Domain: Scale, Manipulation, and Consumer Protection

Ethical challenges in the B2C domain most often relate to the mass manipulation of users through personalization and the protection of the privacy of a vast number of individuals. Given the direct-to-consumer nature of these tools, key risks include [10]:

- **Misinformation and Hallucinations at Scale:** When a B2C tool provides inaccurate information (e.g., incorrect medical advice or financial guidance), the potential for harm is distributed across a massive, non-expert user base, making accountability diffuse and hard to manage.
- **Data Privacy and Manipulation:** B2C models thrive on user data to personalize experiences. This creates a significant risk of data misuse and the potential for manipulative advertising to exploit consumer psychology through personalization.
- **Consumer Rights and Transparency:** Users of B2C tools often lack a clear understanding of how the AI makes decisions or how their data is being used. Ensuring transparency and upholding consumer rights in this asymmetrical relationship is a primary regulatory challenge.

B. Challenges in the B2B Environment: Liability, Security, and Intellectual Property

In the B2B environment, the risks are more focused on data security, infringement of intellectual property through generated code or design, and the question of liability for errors made by AI systems that cause financial damage to another company. The core challenges include:

- **Corporate Data Security:** B2B Gen AI solutions are often integrated into core business systems and may be trained on sensitive, proprietary data (e.g., financial records, trade secrets, customer lists). A data breach or model leak can have catastrophic economic and competitive consequences.
- **Accountability and Liability:** If a Gen AI tool produces faulty code that causes a client's system to fail or generates marketing material that infringes on a copyright, who is liable? The AI provider, the company using the tool, or both? Establishing clear lines of accountability in business contracts is a critical legal hurdle.
- **Intellectual Property (IP):** The question of who owns the output generated by a Gen AI tool for a business client is a complex legal gray area. B2B contracts must meticulously define ownership and usage rights for AI-generated designs, software code, reports, and other materials to avoid future disputes.

C. Challenges in the B2G Sector: Public Trust, Oversight, and Sovereignty

B2G projects are similar in general structure to B2B projects, except for the target group they cover. However, they still differ significantly [13]. The B2G model presents unique challenges related to public trust, democratic control, and the

potential for AI misuse in critical state functions, such as security or justice. These applications carry the highest level of societal risk:

- **Public Trust and Democratic Oversight:** When governments use AI for public services (e.g., social benefit allocation, predictive policing, or judicial support), decisions must be transparent, auditable, and accountable to the public. The risk of "black box" algorithms eroding public trust in state institutions is immense.
- **Data Sovereignty and National Security:** The use of AI in government raises critical questions about where sensitive citizen data is stored and processed, especially if third-party, foreign-owned platforms are used. This intersects with issues of national security and digital sovereignty.
- **Equity and Systemic Bias:** If a Gen AI system used by the government is trained on biased historical data, it can perpetuate and even amplify systemic discrimination on a societal scale. Ensuring fairness and equity in B2G applications is a paramount ethical and regulatory imperative.

As demonstrated, the ethical and regulatory landscape of Gen AI is highly fragmented. The locus of concern shifts dramatically—from protecting the individual consumer in the B2C space, to mitigating corporate and financial risk in B2B interactions, and finally to safeguarding public trust and democratic principles in the B2G model. This differentiation is crucial, as it highlights why a one-size-fits-all approach to regulation is likely to fail. Effectively governing this technology requires a nuanced, context-aware framework that addresses the specific vulnerabilities inherent in each commercialization pathway.

V. CS: SERBIA

The commercialization and adoption of Generative AI in Serbia present a picture of emerging potential set against current market realities. While the Serbian government has demonstrated a significant strategic commitment to developing AI capabilities, data on enterprise adoption suggests that the market is still in its early stages.

According to the official 2024 report from the Statistical Office of the Republic of Serbia, only **7.0%** of enterprises use any form of artificial intelligence technology. The adoption rate varies significantly with company size, being highest among large enterprises (14.6%) and lower in medium (9.7%) and small (6.0%) businesses. Unsurprisingly, the Information and Communication sector leads with a **29.0%** adoption rate, whereas traditional sectors, such as Construction (0.6%) and Accommodation and Food Services (0.2%), lag significantly behind [14].

Crucially, while these statistics provide a valuable baseline, they do not specify which AI technologies are being used or for what purposes. The official survey questionnaire included detailed questions on the types of AI (e.g., text mining, machine learning) and their application areas (e.g., marketing, logistics). The absence of these results in the final publication suggests that the disaggregated data may have been too sparse to be statistically significant—a common practice when cell counts are too low for reliable reporting. This highlights a critical data gap for a deeper analysis of Gen AI commercialization.

The application of Generative AI in Serbia's public sector (B2G) is accelerating through concrete strategic projects. In April 2025, a contract was signed with the French company Bull SAS (part of the Eviden group) for the procurement of a new supercomputer intended for training and hosting future AI applications, as part of the "*Leap into the Future – Serbia 2027*" program [15]. Additionally, in June 2025, a "smart digital assistant" was implemented on the eUprava Portal. Using an OpenAI language model, it provides basic information to users, with a plan to become transactional in a second phase, including booking appointments and automating processes [16].

These initiatives demonstrate a strategic shift towards the broader application of AI in e-government and the digitalization of public services, accompanied by the strengthening of necessary infrastructural support.

While enterprise adoption remains low, the picture among individual users tells a different story, marked by high engagement and positive perception. Although precise official user counts are unavailable, proxy indicators offer valuable insight. Data on market share, for instance, confirms the popularity of specific tools. According to **Statcounter Global Stats** for June 2025, **ChatGPT** holds a dominant market share of **95.92%** among AI chatbots in Serbia (Fig. 3.) [17].

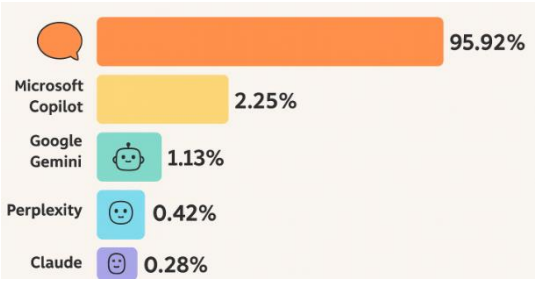

Fig. 3. Mobile AI Chatbot Market Share in Serbia - June 2025 [16]

A general openness to AI technology supports this widespread popularity. The **STADA Health Report (2024)** reveals that **65% of Serbian citizens** hold a positive attitude towards artificial intelligence, surpassing the European average and indicating a significant potential and actual user base [18].

In summary, the Serbian case illustrates a dichotomy: a strong top-down strategic push for AI development contrasts with a bottom-up commercial adoption that is still nascent and heavily concentrated in the ICT sector. While enthusiasm and individual use are growing, comprehensive data on the specific commercial applications of Gen AI remains limited, underscoring the challenge of practice outpacing systematic analysis and reporting.

VI. CONCLUSION

The commercialization of generative artificial intelligence is evolving rapidly and has the potential to impact both business and society profoundly. Unlike previous industrial revolutions where science preceded practice, in the case of Gen AI, industry development has outpaced academic and regulatory tempo. Practice has overtaken theory, confirmed by research showing that 84% of respondents from media and scientific communities felt unprepared for such rapid transformation.

Successful and responsible commercialization requires a clear distinction between B2C, B2B, and B2G models, as each carries specific challenges and opportunities. The synergy between industry, academia, and regulators can ensure that Gen AI becomes the foundation of sustainable technological progress rather than a source of new problems.

The unique aspect of Gen AI commercialization lies in its unprecedented speed of transition from laboratory to everyday practice, often ahead of academic understanding. This phenomenon necessitates more intensive collaboration between all stakeholders to ensure the responsible development and deployment of this transformative technology.

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