

Context of Business Transformation: From Traditional to Generative AI Agents

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Abstract— In business processes, the activities of people are less and less represented. Realization of the needs of users as well as employees in companies can be realized through the application of computer systems. This paper presents the dimensions of context and situational parameters in communication processes. Business modalities include the traditional ways that are still applied, the application of autonomous intelligent agents and the application of generative artificial intelligence agents that are currently occupying the academic community and increasingly business societies and organizations. The main goal of the work includes the presentation of the advantages of applying innovative digital technologies and the transformation that is inevitable. In this paper, the semantic dimensions of the context with the factors of communication dynamics and models of communication dynamics are presented, where the advantages of the application from traditional to generative artificial intelligence agents are clearly seen.

Keywords— *electronic business, transformation, generative artificial intelligence, innovative models, user and employee needs*

I. INTRODUCTION

Basically, people who can be users of the service or employed in companies in accordance with their own or business needs have greater and more complex requirements compared to the period ten years ago. The accelerated development of the market, improvement of operations in organizations or today's pace of life also requires a large number of sacrifices that are an integral part of everyday activities. Today, when people as service users, companies and organizations as service providers are increasingly applying advanced Internet technologies in electronic business [1].

People's need to realize their activities creates new demands that, based on their thinking, must be realized in the shortest possible time, in order to increase overall satisfaction. Now the question arises, "What does the user need to realize his needs in a functional, safe and quality process?". The answer to this question can be in the application of advanced Internet technologies that are an integral part of electronic business. In this way, service users can, in addition to their daily business obligations, realize their private needs via computer.

Today, there is a large presence of computers and the Internet on the territory of the Republic of Serbia. Based on

the conducted research for a period of three months in 2024, computer users with no education and lower education use computer hardware and software components 51%, with secondary education 73.2% and with higher education 92.3%, while users also use the Internet without education and lower education 63.4%, with secondary education 92.1% and with higher education 97.8% [2]. Unlike private users, all companies use computers and the Internet 100% [3].

This paper presents business modalities, from the traditional model that was represented in the recent past to today's generative artificial intelligence agents that are increasingly applied in all electronic business processes.

II. RELATED RESEARCH

Below, some related research is selected, where the potential of digital environments, which can completely replace traditional ways of doing business, can be seen.

In this article, configuration theory is adopted to investigate how different combinations of regional factors contribute to profitability, emphasizing the principle of equifinality, which states that multiple, equally efficient configurations can lead to similar outcomes. This study examines the interaction of multiple factors – enterprise informatization, digital infrastructure, e-commerce, technology investments, innovation, hardware and software – within four key themes: digital readiness and technological integration, market and economic enablers, innovative capacity and activity, and basic artifacts and resources [4].

The digital twin (DT) is an emerging technology surrounded by much promise and potential to reshape the future of industries and society as a whole. DT is a system of systems that goes far beyond traditional computer simulations and analyses. It is the replication of all elements, processes, dynamics, and firmware of a physical system into a digital counterpart. The two systems (physical and digital) exist side by side, sharing all inputs and operations using real-time data communication and information transfer. By incorporating the Internet of Things (IoT), artificial intelligence (AI), 3D models, next-generation mobile communications (5G/6G), augmented reality (AR), virtual reality (VR), distributed computing, transfer learning (TL), and electronic sensors, the digital/virtual counterpart of a real-world system is able to provide seamless monitoring, analysis, evaluation, and prediction. DT offers a platform for testing and analyzing complex systems, which would be

impossible in traditional simulations and modular evaluations [5].

Digital Twin for Vehicle Networks (DTVN) continuously simulates and optimizes vehicle behavior to support emerging 6G Internet of Vehicles (IoV) applications, such as DT-assisted autonomous driving. In order to meet the quality of service (QoS), resource scheduling is performed for distributed DT vehicles. However, existing works mainly respond to service demand based on one-to-one DT synchronization and offloading of computation, which limits the quality of service response and is not sustainable. Meanwhile, the twin objects need to be frequently transmitted at the edges in parallel with the moving vehicles, responding to IoV service demand under highly dynamic DT resource distribution is challenging [6]. The global retail industry has experienced a massive expansion of e-commerce in the past decade, transforming physical stores into digitalized entities. One of the biggest threats to e-commerce is click fraud, which generates false clicks without true intent on online advertisements using automated software programs or organized human activities. This has become a major threat to the online advertising ecosystem, causing huge losses for technology companies such as Google, Facebook, and Meta, which rely on pay-per-click (PPC) models [7].

Electronic commerce or e-commerce encompasses services and good exchange over electronic support such as the Internet. It plays a key role in today's business and customer experience. Also, e-commerce platforms produce a huge amount of information. Therefore, recommender systems (RS) are a solution to overcome the problem of information overload. They provide personalized recommendations to improve user satisfaction. The author's paper [8] illustrates a systematic literature review (SLR) regarding the papers published in the field of e-commerce recommender systems. This review covers five categories of RS algorithms, including content-based filtering (CBF), collaborative filtering (CF), demographic-based filtering (DBF), hybrid filtering, and knowledge-based filtering (KBF) [8].

In an era where data is the cornerstone of strategic decision-making, Generative Artificial Intelligence (Gen AI) is revolutionizing the business intelligence (BI) landscape. It explores the multifaceted role of Generative AI in BI, spanning data generation and augmentation, predictive analytics, reporting automation, product and service innovation, and user experience personalization. It combines synthetic data generated using Generative Adversarial Networks (GANs) and Seasonal Autoregressive Integrated Moving Average (SARIMA) predictive modeling techniques to demonstrate the powerful capabilities of Generative AI in enhancing data-driven insights. Generative AI has been found to not only significantly improve the accuracy of predictive models, especially in scenarios with limited historical data, but also streamline reporting processes and catalyze innovation by uncovering latent customer needs. The transformative impact of generative AI in BI is highlighted, while also addressing the accompanying ethical considerations and the need for rigorous data governance [9].

A new framework for enterprise AI architecture is proposed, emphasizing the integration of three frameworks - TOGAF, BDIR and INSIGHT - to create a robust and comprehensive methodology. The integrated approach

addresses the unique challenges and considerations inherent in designing, implementing and managing AI systems in an enterprise context. The approach leverages the strengths of three distinct frameworks, TOGAF (The Open Group Architecture Framework), offering a structured approach to designing the data architecture, applications and technologies necessary for implementing AI. Decision analysis, such as BDIR (Business Question, Analysis Plan, Data, Insight, Recommendation), guides the translation of business objectives into data-driven decisions, ensuring that AI initiatives are driven by clear business needs and result in actionable recommendations [10].

The rapid growth of generative artificial intelligence has dramatically changed business operations across all sectors. It is important to understand its impact on efficiency, productivity, and decision-making as more organizations implement AI tools. It analyzes the use of generative artificial intelligence in business operations, assesses its impact on workforce performance, and explores trends in AI adoption across industries. Unlike previous research on theoretical frameworks, the study collects data from various sectors to demonstrate practical implementations of generative artificial intelligence, as well as employee perceptions. It proposes an organized framework that encompasses the process of data collection and analysis and assessing the impact of AI on business processes. It uses statistical methods, descriptive analytics, and trend analysis to extract insights from the collected data [11].

III. SEMANTIC CONTEXT DIMENSIONS AND SITUATIONAL PARAMETERS BETWEEN TRADITIONAL BUSINESS, AI INTELLIGENT AGENTS AND GENERATIVE AI AGENTS

A. Basic process elements of all business models

Using the Internet creates new business opportunities for potential users and employees in companies. In the recent past, users met their needs where physical presence was required, in a specific facility and direct communication with authorized employees. While the employees of the companies had to analyze a large number of documents in paper format and based on them, make their reports, which they have to deliver physically to their superiors. With the users as well as with the employees, a certain amount of time is needed for the realization of the activity, which also includes the time "spent" for preparation.

In other words, it takes time that users and employees cannot learn from the aspect of reducing or connecting with other events. All events and activities that are realized by the user or employee, in interpersonal communication between at least two people (face to face) or by means of a medium (computer) represent a specific process. It takes a certain amount of time to implement the process. For ease of understanding, it should be noted that "event" is a description of something during the realization of a process, "activity" is a description of an action performed within the process, and finally "process" is a term used for the current execution of a set of events and activities. Three levels can be distinguished in one process. The process is initiated by an event that can be the intention of the user or employee in interpersonal communication or the same initiators with the computer. A series of sequentially linked events represent intended activities. A set of activities represents one process. The basic elements of the process that are applied in all business models are shown in Fig. 1.

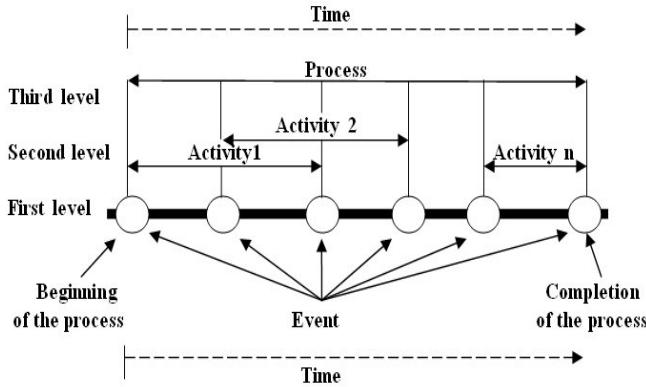


Fig. 1. Interconnection of events, activities and processes in all business models

B. Semantic dimensions of context between Traditional business, AI intelligent agents and Generative AI agents

Traditional business models generally require the physical presence of users, employees or interested people in the realization of their personal and business needs. The traditional AI (artificial intelligence) approach based on autonomous intelligent agents is less and less involving

humans in their interaction roles in order to reduce possible errors or undertaking unfavorable business processes. Their integral part is based on limited data (selected by the administrator or an authorized person) that are intended only for specific situations and processes that can be realized in the virtual space. One of the examples can be the application of intelligent agents intended for traffic regulation and management [12], [13].

Unlike the aforementioned business models, generative AI agents have the ability and ability to adapt to current and emerging events without any "limitations". This electronic business model based on generative AI has the ability to learn based on a large database as well as the processes themselves where new patterns of decision-making, presentation and execution of business tasks of users and employees as well as other people who need to apply an advanced digitalized way are created.

In the following, the situational factors of communication dynamics that can include all the mentioned models with advantages and disadvantages will be presented (Table 1).

TABLE I. SITUATIONAL FACTORS OF COMMUNICATION DYNAMICS

Semantic dimensions of context / Factors of communication dynamics	Traditional model	Traditional AI model (Intelligent Agents)	Model of generative AI agents
Who? (ROLES)	User or employee in direct communication with authorized people	Intelligent agents with specific services and selected databases	Generative AI agents with services and available databases
What? (RELATIONS/FUNCTIONS)	The need to implement activities with authorized people	Personal needs of the company in the business sector	All the needs to perform a reliable and timely service through the exchange of messages for the realization of events
Where? (SPACE-LOCATION)	Departure of the user or employee to the official premises	Virtual space of a company in the business sector	Virtual space of cloud computing (cloud computing)
When? (TIME-MOMENT OR INTERVAL)	Limited working hours of the official facility for the user / working hours of superiors in the company	Currently, upon receipt of a certain format (context) of the message, 24/7	Currently, upon receiving different message formats (contexts), 24/7
How? (INTERACTIONS /TECHNOLOGY)	In direct communication with users and employees in official premises with available equipment	Execution and implementation of service activities in a homogeneous digital business environment with selected technologies	Execution and implementation of service activities in a heterogeneous digital environment with all available technologies
Why? (QUALITY / SAFETY / SECURITY / SATISFACTION)	Realization of one's needs and business tasks for personal satisfaction	Satisfaction of employees in the implementation of planned activities in accordance with the standards of quality, safe and secure service	Maintaining scalability parameters and a good image of the company with the aim of increasing quality

C. Comparative overview of the business models of Traditional AI and Generative AI agents

A comparative overview of transactional business models can be observed based on situational parameters that basically include: space, time, roles, relationships, interactions and environment (Table 2). The table clearly and unambiguously shows the big differences between the business models. The traditional model has a lot of shortcomings because it involves the user or employee going to official premises that have limited random time, direct relationship in verbal communication, and the like. If you

look at the current latest model of generative AI agents, you can see the advantages compared to the others that were applied. Specific advantages are presented through the application of cloud computing, communication from anywhere and at any time during every day of the year, the availability of all available digital services as well as the ability of generative AI agents to perform business tasks. Based on the executed digital transactions, the database is expanded so that generative AI agents can "learn" and create new innovative responses for greater user and employee satisfaction.

TABLE II. DISPLAY OF THE MODEL IN VARIOUS SITUATIONAL PARAMETERS

Model / Situational parameter	Traditional model	Traditional AI model (Intelligent Agents)	Model of generative AI agents
SPACE	Office premises	Services of a company in a closed system of virtual space intended for communication	Open services of the company and computing in the cloud (cloud computing)
TIME	Limited working hours of the official facility	24/7	24/7
ROLES	User and employee with a need / authorized official	Integration and implementation of services for undertaking expected digital actions	Integration and implementation of services for undertaking expected and unexpected digital actions
RELATIONS	Business relationship between the user and the employee with the authorized person	Orchestration and choreography of basic services for the realization of transactional activities	Orchestration and choreography of all available services for the realization of transactional activities
INTERACTIONS	User and employee in direct interaction with an authorized person	Services that are implemented and integrated only with certain parameters (devices, systems, own databases)	Services that are implemented and integrated only with all available parameters (devices, systems, own and all available databases)
ENVIRONMENT	Physical access of the user and the employee to the predetermined premises	Service operations of the company in digital transaction activities	Platform for GenAI agents (company server, cloud computing, Big database)

IV. CONCLUDING CONSIDERATIONS AND A PROPOSAL FOR FUTURE RESEARCH

A. Concluding

In this work, the advanced internet technologies that are available to people are presented first. Based on the application of technologies, users, employees of companies, government institutions can realize their needs and business tasks faster and better. Today, a large number of people, users have advanced mobile devices in the form of smartphones, smart watches and bracelets with which they can satisfy their needs from anywhere and at any time, of course, with the use of wireless computer network connectivity. Also in the government sector as well as in enterprises in state or private ownership, the representation of computers and access to telecommunication networks (wired or wireless) is at the highest level.

Related literature is selected to introduce the reader to the technological advances that have been made in computer systems. The term "process" is explained, its meaning, the constituent elements that are represented in all business models, from the traditional one that is still applied in rural areas to generative AI agents that are the most significant advanced technology today. Generative AI agents are primarily used in higher education institutions, scientific institutes and certain economic sectors.

The central part of the paper presents the semantic dimensions of the context, where all business modalities are included, their transformation, the advantages that significantly emphasize the application of generative AI agents in everyday private or business activities, as well as the disadvantages that are currently most represented in the traditional model. A comparative review of situational parameters also confirms and highlights the importance of applying advanced technologies based on generative AI agents.

The implications can be multiple for researchers and business experts. In a theoretical sense, readers can clearly see the advantages of the application of computer technologies and also the disadvantages of the application of

traditional models that are still used today. When it comes to practical implications, the implementation and application of innovative services can confirm the justification of artificial intelligence generative agents in almost all business processes that can be implemented digitally.

B. Future Research

Research that needs to be conducted in the near future should include teaching staff in the field of information systems and information technologies in order to apply the development and application of electronic business technologies as much as possible. In this way, other employees in educational and scientific institutions create the prerequisites for the implementation and application of advanced technologies in all areas of electronic business for mass use in all environments where technical infrastructure computing capacities allow. The training provided can be in the form of schooling, seminars, conferences and finally testing of participants in order to monitor their progress.

The second step should include the implementation of generative artificial intelligence services in companies in electronic business models. In this way, service users can see and apply the advantages of the innovative model of electronic business. During their interaction with the service, they learn and realize their activities in the shortest possible time. At the same time, generative artificial intelligence learns on the basis of initiated requests and can create innovative models for increasing quality.

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