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R. Abduqayumova, S. Uktamov
The role of ai in enhancing omni-channel customer support system: a study of call centers in Uzbekistan.....150

G. Samatov, I. Maxsumov, D. Yuldoshev
Improvement of the methods of reliable delivery of cargo flows in the international direction (in the example of the Termiz-Mazari-Sharif route) Systematic analysis of the literature).....154

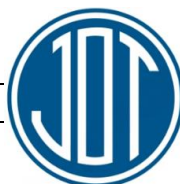
D. Nazhenov, A. Baqoyev, A. Yusupov, Sh. Suyunbayev
Development of a method for assessing the impact of organizing shunting operations with different numbers of locomotives on the quality indicators of the use of rail transport165

N. Aripov, N. Tohirov
Improving Methods to Reduce Inefficient Time Losses under Speed Limit Conditions at JSC “Uzbekistan Railways”172

O. Turdiev
Analysis of the optimizer's performance in solving the traveling salesman problem.....177

A. Babaev, A. Ibadullaev, A. Arifjanov, U. Chorshanbiev
Options for solving two-dimensional elastic bodies using the finite element method181

Sh. Kayumov, A. Bashirova
Automation of operational control of wagon flows in the technological cycle industrial enterprises of railway transport.....185



The role of ai in enhancing omni-channel customer support system: a study of call centers in Uzbekistan

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Abstract:

The swift adoption of Artificial Intelligence (AI) technologies is transforming call centre operations management, revolutionizing customer service and operational efficiency. This paper explores the impact of AI-driven tools, such as Speech-to-Text (STT) and Text-to-Speech (TTS) systems, on call centre performance and economic outcomes, focusing on the rapidly growing market in Uzbekistan. Drawing on qualitative interviews and quantitative market data, this research highlights how AI improves operational efficiency through customer conversation analysis, error tracking, and sentiment analysis. Additionally, the study provides a statistical forecast on market capture, showing potential growth trends for AI-based startups in Uzbekistan's telecommunications, EdTech, retail, and other key sectors. With a Serviceable Obtainable Market (SOM) of 1% and an optimistic growth outlook, this paper argues that AI tools offer considerable strategic value for businesses aiming to enhance customer satisfaction and optimize service operations.

Keywords:

Speech to Text, Text to Speech, AI, Market capture, call centers

1. Introduction

The customer service operations in many sectors are changing due to the swift advancement of Artificial Intelligence (AI) technologies. Call center operations management is one of the main areas where artificial intelligence (AI) is having a big impact[1]. Here, AI is being used more and more to analyze customer conversations, expedite workflows, and improve decision-making[2]. Artificial intelligence (AI)-driven technologies, like machine learning (ML) and natural language processing (NLP), are enabling managers access to real-time data-driven insights that improve customer satisfaction, cut costs, and increase operational efficiency[3][4].

Even though AI is being used more and more in this industry, little is known about how AI-driven insights may strategically improve operations management in contact centers[5]. This paper is aiming to highlight operational enhancement in sector segments that AI powered tools can bring.

Moreover, The STT (Speech to text) and TTS (Text to speech) technologies are widely being used by a range of industries including healthcare, IT & telecommunications, BFSI, automotive, government & legal, education, retail & ecommerce, media & entertainment, and others[6]. The world market size is calculated to be equal to USD 12.6B for STT and USD 2.8B for TTS in 2023 (Fortune Business Insights, 2023).

However, Uzbekistan as being one of the countries where businesses are adopting STT and TTS AI tools very rapidly, quite limited research is available on economic value of current markets in Uzbekistan's economy.

This research is aiming to develop statistical forecasts on market capture for coming years, based on market size, linear regressions trend analysis and market capture power of existing AI based startups.

2. Methodology and Data

The study utilized both quantitative and qualitative data to ensure comprehensive analysis. Primary data was collected through qualitative survey and interview of startup team members that are developing AI powered STT and TTS solutions for Businesses in Uzbekistan, offering firsthand insights into the research subject. In contrast, secondary data was obtained from State Statistics Committee of the Republic of Uzbekistan, Fortune Business Insight, peer-reviewed journals, and industry publications, ensuring that existing research and contextual data were incorporated into the analysis. While the primary data will focus on Uzbekistan market and economy, the benchmarking has been done based on international developed economies.


3. Results

The primary qualitative interview had contributed to reveal following operational advancements of AI tools in Context of Uzbekistan Market:

1. Speech-to-Text (STT) Capabilities:

- **Languages Supported:** The STT technology supports multiple languages, including **Uzbek, Russian, Kazakh, and English**. This diversity allows for broad applicability in multilingual regions, especially in Central Asia.
- **Speaker Identification:** AI tool can determine the **language spoken** and **identify individual speakers**, enhancing its utility in call centers where conversations may involve multiple agents or languages.
- **Timestamps:** Each word recognized by the system is tagged with a **timestamp**, which can be critical for reviewing and analyzing specific parts

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of conversations, ensuring efficient audit and compliance processes.

- **Performance and Accuracy:** 95% Recognition Accuracy
- **Deep Audio Wave Analysis:** This suggests that the system doesn't just transcribe basic audio but performs an in-depth analysis of the audio wave, possibly detecting nuances in tone, emotion, or speaker intent.
- **Specialization for Uzbek Language and Dialects**

2. TTS Technology Overview:

- **High-Speed Audio Analysis:** The technology analyzes audio "within fractions of a second," ensuring rapid and accurate recognition of speech, including its **stylistic diversity**. This allows for smooth, real-time interactions through voice assistants, eliminating delays in communication.
- **AI-Driven Text-to-Speech Conversion:** The system uses AI to **convert written text into natural-sounding speech**, enabling automated, human-like conversations. This is particularly valuable in automating customer interactions in call centers or virtual assistants.
- **Intonation Control:** The TTS system offers the ability to select different intonations, allowing customization of the speech tone to match the desired emotional context (e.g., polite, formal, or friendly).
- **Voice Selection:** Users can choose from a variety of voice options to fit different business needs, such as gender, age, or style, making interactions feel more personalized and engaging.
- **Automation for Call Centers:** The system enables automation of call center operations, where pre-programmed responses are voiced by the TTS engine, allowing agents to handle routine inquiries more efficiently or even replace them in certain cases with virtual agents.

3. Analysis capabilities:

- **Summary Analysis:** AI tools provide a **brief and accurate summary** of conversations or call interactions, which is extremely useful in call center environments for quickly reviewing key points discussed without going through the entire conversation.
- **Sentiment Analysis:** The system can analyze the **emotional tone** of the conversation (positive, negative, neutral) through sentiment analysis. This feature can be valuable in understanding customer satisfaction, agent performance, and the general mood of the interaction. Sentiment analysis helps in categorizing interactions for further action, like flagging dissatisfied customers or providing follow-up service.
- **Translation:** The inclusion of **translation capabilities** indicates that AI system can process and convert speech or text between multiple languages, which is ideal for multilingual call centers operating globally. This functionality

ensures that customer inquiries are understood and addressed, regardless of the language spoken.

When it comes to quantitative analysis the research has been conducted in two aspects:

Key Features of Speech analytics across sectors and economic market capture forecast.

1. Feature analysis by Sector

In the economic context of Uzbekistan, the main niche market that AI startups are concentrating on are following: Telecommunications, EdTech, Retail, Auto service, fitness, real estate, healthcare, financial institutions, taxi service. When the key features of AI tools have been analyzed by each sector the following table has been made:

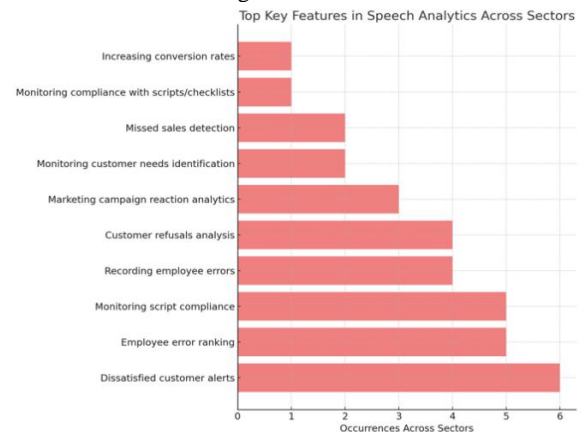


Figure 1: Top Key Features in Speech Analytics Across sectors

From Figure 1 it can be concluded that Dissatisfied customer Alert is one of the biggest problems that Speech analysis tools can solve. Ranking employees based on errors they make during customer interactions is a prevalent practice, which helps improve training and performance management. This feature is frequently used to track and analyse mistakes made by employees during interactions, providing valuable data for performance improvement. And especially for customer-oriented service sector customer refusal analysis, need identification, missed sales detection features is considered to be quite beneficial.

Speech analytics is a technology that allows firms to examine client interactions and derive insightful information. By immediately identifying unsatisfied customers in real-time, it enables businesses to promptly address the issue and enhance customer satisfaction. It raises operational efficiency and upgrades training programs by tracking employee performance through error ranking and script compliance monitoring. Speech analytics additionally helps in sales optimisation by detecting lost sales chances and examining customer refusals, which facilitates the improvement of marketing and customer service tactics. All things considered, it is a vital instrument for raising business outcomes, operational performance, and customer service in of industries.

2. Economic market capture

The world market size of STT and TTS is calculated to be equal to USD 12.6B and USD 2.8B in 2023 consequently, based on Fortune Business Insights. In this research the main concentration of STT and TTS based companies concentrated market sizes has been calculated based on statistics of State Statistics Committee of the Republic of



Uzbekistan.

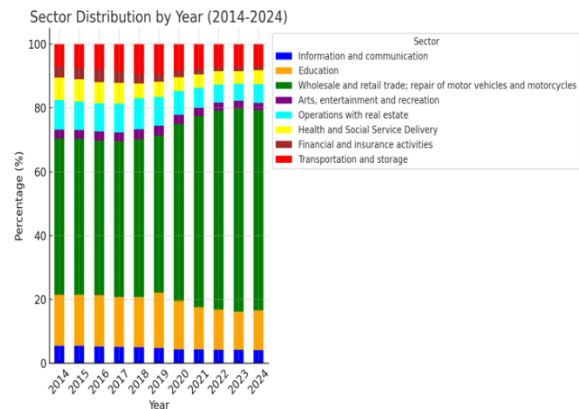


Figure 2: Sector Distribution by Year

Based on given statistics the linear graph of trend for each industry has been created as shown in Figure 3, indicating the increase trendline in the sectors that AI based startups concentrate on.

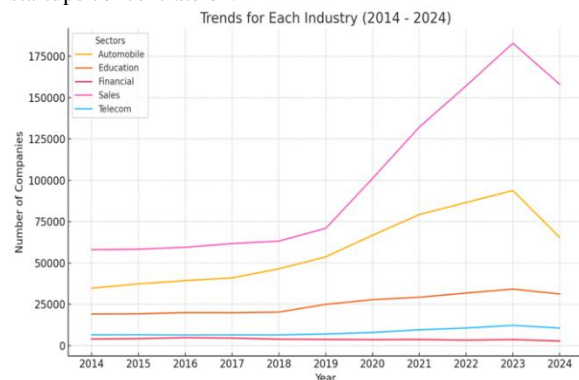


Figure 3: Trends by industry

When the market capture power of AI based startups has been calculated with SAM being equal to 10% and SOM being equal to 1% linear and accelerated growth for 10 years has been plotted in figure 4. If the industry sectors will have steady growth, and AI startups will have stable linear market capture power, the industry may still lie behind the world economic trend, but with Accelerated growth, AI startups has power to capture the considerable share of market within 10 years.

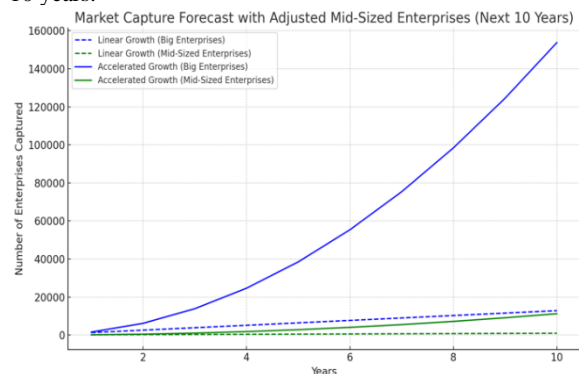


Figure 4: Market capture forecast

4. Conclusion

This study has successfully highlighted the profound

impact of Artificial Intelligence (AI)-driven Speech-to-Text (STT) and Text-to-Speech (TTS) technologies on customer service operations within Uzbekistan's diverse economic landscape. Through a combination of qualitative insights from industry stakeholders and quantitative analysis of market data, the research underscores how these AI tools are revolutionizing call center management by enhancing operational efficiency, improving customer satisfaction, and enabling data-driven decision-making[7].

The qualitative findings reveal that advanced features such as multilingual support, high recognition accuracy, speaker identification, and sentiment analysis are pivotal in tailoring AI solutions to the specific needs of Uzbekistan's market. These capabilities not only streamline workflows but also provide nuanced insights into customer interactions, thereby facilitating more effective training, performance management, and personalized customer service. The ability of AI tools to perform deep audio wave analysis and offer customizable TTS options further enhances their applicability across various sectors, including telecommunications, healthcare, retail, and financial services[4].

On the quantitative front, the market analysis indicates a robust growth trajectory for AI-based startups in Uzbekistan. With the global market sizes for STT and TTS technologies projected at USD 12.6 billion and USD 2.8 billion respectively in 2023, the local market is poised for significant expansion. The forecast models, based on linear regression and market capture power of existing startups, suggest that Uzbekistan's AI sector could achieve substantial market penetration over the next decade, particularly under accelerated growth scenarios. This presents a lucrative opportunity for startups to capture a meaningful share of the market, driving economic value and fostering innovation within the region.

Moreover, the sector-specific feature analysis demonstrates that AI-driven speech analytics can address critical operational challenges such as identifying dissatisfied customers, optimizing sales processes, and enhancing employee performance. By providing real-time insights and actionable data, these technologies empower businesses to make informed decisions, thereby elevating overall service quality and operational performance.

However, the study also acknowledges certain limitations, including the nascent stage of AI adoption in Uzbekistan and the need for more comprehensive data to refine market forecasts. Future research should focus on longitudinal studies to track the sustained impact of AI integration and explore potential barriers such as data privacy concerns, integration costs, and the need for workforce upskilling.

In conclusion, the integration of AI-powered STT and TTS technologies offers a transformative potential for Uzbekistan's customer service operations. By leveraging these advanced tools, businesses can achieve enhanced efficiency, greater customer satisfaction, and significant cost savings. The promising market forecasts underscore the economic viability of investing in AI-driven solutions, positioning Uzbekistan as a burgeoning hub for AI innovation in the region. As AI technologies continue to evolve, their strategic implementation will be crucial in shaping the future of contact center management and driving sustained economic growth in Uzbekistan.



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