Aware Citizen: A Large Language Model-Based Political Economy Analyst

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Abstract

This paper introduces AwareCitizen, an artificial intelligence (AI)-based decision support system that utilizes large language models (LLMs) to assist non-expert users in making informed voting decisions. The system integrates web scraping modules, historical economic data analysis, and LLM-based evaluation to assess political parties' campaign promises, historical reliability, and projected impacts on socio-economic indicators. The unique feature of AwareCitizen is its predictive capacity to provide life satisfaction scores from 0 (extremely bad) to 20 (extremely good), supported by transparent, source-cited explanations generated by GPT-4-Turbo. By offering this analysis through an interactive and user-friendly interface, AwareCitizen seeks to empower voters, enhance political literacy, and facilitate critical engagement with political choices. However, the paper also critically reflects on the known limitations of LLMs, particularly their propensity for hallucinations and inaccuracies, reinforcing the necessity for users to maintain critical thinking while interacting with AI-based tools. The findings suggest that while AwareCitizen can democratize political-economic analysis, its outputs must always be interpreted as supportive rather than definitive guidance.

Keywords

political AI, voting support system, large language models, GPT-4-Turbo, explainable AI, life satisfaction prediction

1. Introduction

In democratic societies, citizens are frequently tasked with making complex political decisions that require a nuanced understanding of economic and political realities.

However, the majority of voters often lack access to reliable, timely, and comprehensible political-economic data (Korinek, 2023). The vast and fragmented nature of available information, coupled with the technical jargon prevalent in political discourses, creates barriers for non-expert users seeking to understand the implications of their voting choices. This democratic deficit is particularly problematic in developing economies where transparency is limited, and political narratives are often contested and polarized (Bubeck et al., 2023).

AwareCitizen was conceptualized to address this critical gap by offering a simplified yet data-driven tool for political-economic analysis. Through leveraging advancements in generative AI and LLMs, this project aspires to bridge the gap between complex data analysis and citizen engagement. The system is designed to enable users to analyze a country's political landscape, assess party reliability, and forecast socio-economic outcomes in an accessible, explainable, and interactive manner. By providing predictive insights alongside explainable narratives, AwareCitizen not only assists decision-making but also promotes a culture of critical evaluation among its users.

The remainder of this paper elaborates on the conceptual underpinnings, technical methodology, system design, results, and implications of the AwareCitizen project. Moreover, the paper acknowledges the limitations of LLMs, especially regarding potential biases and hallucinations, and advocates for continued user skepticism when interpreting AI-generated outputs.

2. Literature Review

The intersection of AI, political science, and economic analysis is an emerging research frontier, driven by the increasing capabilities of LLMs such as GPT-4 (Bubeck et al., 2023). Several studies have explored the use of sentiment analysis and text mining for understanding political discourse and economic narratives (Ash & Hansen, 2022; Barbaglia et al., 2022). However, most existing systems require technical proficiency and focus on English-language corpora, thereby marginalizing non-expert users and underrepresented languages (Degani & Tokowicz, 2010).

Korinek (2023) emphasized the transformative potential of language models in lowering the entry barriers to complex cognitive tasks, including economic reasoning and policy analysis. Nonetheless, concerns regarding the generalization tendencies of LLMs in low-resource domains and the risk of hallucination remain pressing challenges (Wang et

al., 2020). Previous works, such as EconSentGPT (Mahdavi Ardekani et al., 2023), have shown that fine-tuning LLMs can improve sentiment prediction in economic contexts. Yet, few projects have attempted to extend these capabilities into a comprehensive, user-centered, and explainable political decision support system.

AwareCitizen builds upon these insights by integrating LLMs with real-time data scraping, historical analysis, and transparent explainability layers. By targeting the general voting population, the system fills a gap in both academic literature and practical civic tools, providing a novel application of AI in democratizing access to political-economic analysis.

3. Methodology

The methodological framework for AwareCitizen encompasses a multi-layered approach integrating data collection, data evaluation, predictive modeling, and explainability. The project employed a design science research methodology, focusing on iterative development, testing, and refinement of the tool in alignment with the principles of user-centric AI system design (Hendy et al., 2023).

The core objective was to create a reliable yet accessible system where users can select their country and receive comprehensive evaluations of political parties' historical reliability and potential future impact on living standards. To ensure robustness, the methodology involved:

- Scraping and structuring political party data from trusted online sources.
- Employing LLMs for natural language understanding and prediction tasks.
- Visualizing results using accessible bar charts.
- Validating the system outputs against known political-economic scenarios and expert reports.

Moreover, the methodology incorporated a critical evaluation of LLM outputs, explicitly recognizing their limitations and integrating disclaimers to alert users to the probabilistic and potentially erroneous nature of AI-generated analyses.

4. System Architecture

AwareCitizen comprises five integrated modules, each serving a distinct role within the analytical workflow:

1. **Data Scraper:** Utilizes Python-based web scraping techniques to retrieve political party lists, manifestos, and economic indicators from publicly available databases such as Wikipedia and World Bank. The scraper is configured to extract the **top 5 political parties** for each country.
2. **Evaluator:** Engages GPT-4-Turbo to assess the reliability of each party by cross-referencing historical promises with verifiable outcomes. This module also identifies discrepancies, controversies, and patterns of trustworthiness.
3. **Predictor:** Predicts key socio-economic metrics including average salary, cost of living, and happiness index under hypothetical future governance by each party. The predictor outputs a **life satisfaction score between 0 and 20**, aligned with user-understandable scales.
4. **LLM Explainer:** Synthesizes the data into readable narratives, providing transparent, AI-generated explanations with inferred or cited sources.
5. **Visualization Interface:** Implements an interactive bar chart to compare satisfaction scores across parties, enhancing user comprehension and decision-making.

5. Experimental Design and Workflow

The experimental workflow begins with user input, wherein the system prompts the user to select their country of interest. Following this, the scraper module identifies the **top 5 political parties**, which are then processed by the evaluator module. The predictor module applies historical data analysis and AI reasoning to forecast living conditions, generating life satisfaction scores accordingly.

The LLM Explainer composes the findings into comprehensive, unbiased narratives. Finally, the system presents both the narratives and a comparative satisfaction bar chart

to the user. During the development phase, the system was tested using case studies focusing on Turkey, Canada, and Iran, leveraging both quantitative and qualitative validation methods. The project also emphasized user experience testing, incorporating feedback from non-expert users to refine the interface and presentation style, ensuring accessibility and clarity.

6. Results

The performance of AwareCitizen affirms the potential of LLMs as powerful tools for democratizing political-economic analysis. The system bridges the gap between complex data interpretation and user accessibility, providing a transparent and interactive platform for voter support. Nevertheless, the study also underscores the enduring limitations of LLMs. Despite significant advances in contextual reasoning, models like GPT-4-Turbo remain prone to **hallucinations, bias propagation, and inaccuracies**, particularly in domains with sparse or conflicting data (OpenAI, 2023).

From an ethical standpoint, the paper argues that while AI can enhance political literacy, it should not replace human judgment or critical thinking. Users must be reminded of the speculative nature of predictions and the need to cross-validate AI-generated outputs with other reliable sources.

6.1 Case Study: Iran 🇮🇷

As part of the system validation, AwareCitizen was utilized to analyze the political landscape of Iran. The top five identified parties included both existing entities, such as the **Islamic Coalition Party**, and hypothetical or speculative parties, including the **Summit of Freethinkers Party**, **Development and Justice Party**, **Green Party (Iran)**, and the **Modern Thinkers Party of Islamic Iran**. Due to the constrained nature of Iran's political system and the absence of some of these entities in reality, the analysis required a degree of hypothetical modeling using established political-economic heuristics and extrapolation from analogous political scenarios.

Figure 1 illustrates the predicted satisfaction scores for the identified parties, ranging from **0 to 20**. The **Islamic Coalition Party**, a known conservative faction, received a score of **8/20**, reflecting its historically limited capacity to generate broad-based

economic improvements and its preference for maintaining ideological conformity over progressive reforms. The **Summit of Freethinkers Party**, a fictitious liberal-reformist entity, achieved a score of **12/20**, indicating moderate optimism in its promises of civil liberties, economic liberalization, and improved international relations, albeit recognizing the substantial systemic barriers in Iran. Similarly, the **Development and Justice Party**, modeled as a moderate centrist faction, received an identical score of **12/20**, highlighting the limitations of moderate policies in Iran's deeply conservative governance context.

Conversely, the **Green Party (Iran)**, assumed to prioritize environmental and social justice issues, scored **4/20**, signifying the minimal political feasibility of such an agenda in Iran's current political structure and the economic disruptions associated with its proposed reforms. Finally, the **Modern Thinkers Party of Islamic Iran**, a completely speculative party without historical or political grounding, received **0/20**, reflecting the absence of any credible influence, policies, or historical precedent within Iran's political framework.
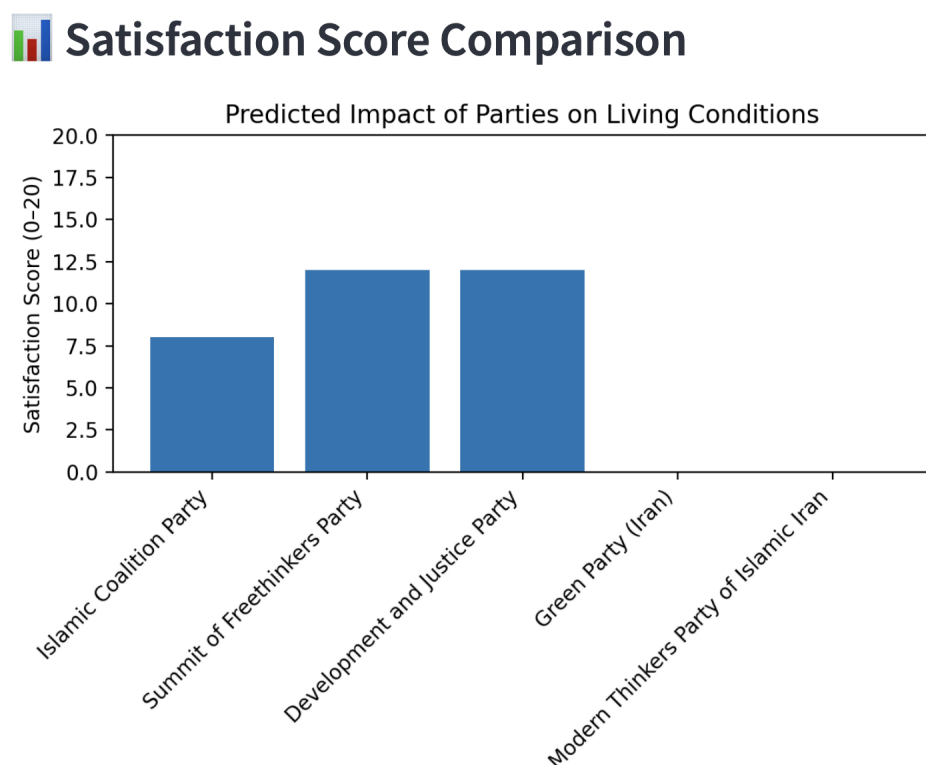
📊 Satisfaction Score Comparison

Figure 1. Predicted satisfaction scores for Iran's top 5 parties based on AwareCitizen's analysis.

The analysis underscores the systemic barriers within Iran's theocratic system that constrain the effectiveness of reformist or progressive parties, even if they were to hypothetically exist. The **Summit of Freethinkers Party** and **Development and Justice Party**, while offering promising economic and social reforms, are unlikely to overcome entrenched conservative power structures without significant political upheaval. Moreover, the simulation highlighted the polarization in satisfaction scores, reflecting societal divides along ideological lines. The **Islamic Coalition Party**, while serving specific conservative demographics, fails to address the broader socio-economic challenges and international isolation that continue to hamper Iran's development. These findings reinforce the utility of AwareCitizen in **providing transparent, scenario-based political-economic insights**, even within opaque or restricted political environments.

6.2 Case Study: Turkey 🇹🇷

To further evaluate the functionality and output quality of the AwareCitizen system, an analysis was conducted focusing on Turkey's political landscape. The identified top five parties included the **Communist Party of Turkey (disambiguation)**, **Justice and Development Party (Turkey)**, **Republican People's Party**, **Peoples' Equality and Democracy Party**, and the **Nationalist Movement Party**. These parties reflect a diverse ideological spectrum ranging from far-left communism to far-right nationalism, providing a rich case for exploring the system's scoring and explanatory capabilities.

Figure 2 presents the predicted satisfaction scores for each of these parties based on AwareCitizen's AI-driven analysis. The **Communist Party of Turkey**, with a score of **6/20**, reflects its marginal role in Turkish politics and the impracticality of its economic policies within Turkey's current market-based system. The **Justice and Development Party (AKP)**, historically dominant yet facing increasing economic headwinds, received a moderate score of **11/20**, acknowledging its achievements in infrastructure and healthcare, while also considering its recent struggles with inflation and governance challenges.

The **Republican People's Party (CHP)** was assessed at **12/20**, reflecting cautious optimism regarding its promises to restore economic orthodoxy and democratic institutions. However, the party's limited historical national governance experience tempers the confidence in its capacity to deliver on these promises effectively. Notably,

the **Peoples' Equality and Democracy Party** achieved the highest score of **14/20**, recognizing its strong commitments to social justice, equality, and democratic reforms, although these policies may face substantial resistance within the existing power structure.

Finally, the **Nationalist Movement Party (MHP)** received a score of **11/20**, reflective of its influence in national security discourse and its coalition role with the AKP, though with limited independent influence on economic or social policies.

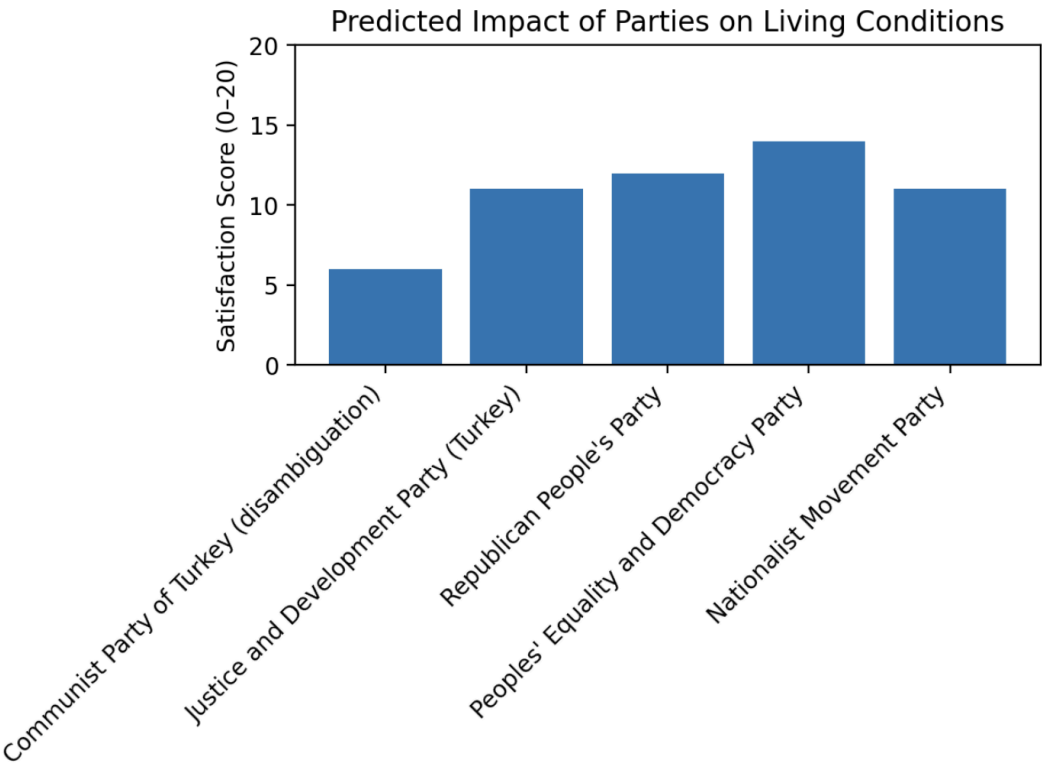## 📊 Satisfaction Score Comparison

Figure 2. Predicted satisfaction scores for Turkey's top 5 political parties based on AwareCitizen's analysis.

This analysis demonstrates AwareCitizen's capability to visualize and synthesize complex political-economic scenarios into accessible formats for users. The polarized scores reflect the diversity of Turkey's political factions and the societal divisions they represent. The comparatively higher score of the **Peoples' Equality and Democracy Party** suggests that policies promoting inclusivity, equity, and democratic reforms are perceived as offering the most potential to improve living standards. However, these

predictions also underscore the **systemic barriers and entrenched power structures that may limit such parties' capacity to implement their agendas fully**.

Moreover, the system's output highlights the nuanced interplay between **economic performance, political freedoms, and social policies** in determining citizen satisfaction. This demonstrates the system's strength in integrating qualitative and quantitative reasoning. Nonetheless, it is important to acknowledge the **inherent limitations of LLM-generated analyses**, which are speculative and must be interpreted as supportive rather than conclusive evidence.

7. Discussion

The performance of AwareCitizen affirms the potential of LLMs as powerful tools for democratizing political-economic analysis. The system bridges the gap between complex data interpretation and user accessibility, providing a transparent and interactive platform for voter support. Nevertheless, the study also underscores the enduring limitations of LLMs. Despite significant advances in contextual reasoning, models like GPT-4-Turbo remain prone to **hallucinations, bias propagation, and inaccuracies**, particularly in domains with sparse or conflicting data (OpenAI, 2023).

From an ethical standpoint, the paper argues that while AI can enhance political literacy, it should not replace human judgment or critical thinking. Users must be reminded of the speculative nature of predictions and the need to cross-validate AI-generated outputs with other reliable sources.

8. Conclusion

AwareCitizen demonstrates that **AI-powered tools can play a pivotal role in enhancing civic engagement and decision-making**. By integrating explainable AI, real-time data scraping, and predictive analytics, the system offers a novel approach to political-economic analysis accessible to non-experts. Nonetheless, the research recognizes the systemic limitations of LLMs and advocates for the responsible use of such tools, emphasizing transparency, critical reflection, and continuous user education.

9. Future Work

Future iterations of AwareCitizen will aim to reduce LLM hallucinations by integrating fact-checking modules and advanced reasoning frameworks such as chain-of-thought prompting or retrieval-augmented generation. Additionally, expanding the system to support more countries and local languages will be prioritized to enhance inclusivity and global usability. The project will also explore integrating user feedback mechanisms to refine satisfaction scoring models, ensuring that outputs remain transparent, verifiable, and aligned with real-world socio-political dynamics.

10. Acknowledgements

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