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Original Research Paper

Algorithmic reconstruction of Iranian identity; A futures study of artificial intelligence in Iran's communication culture

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Abstract

The convergence of AI and IoT is redefining cultural norms and collective identity at an unprecedented pace. In Iran, this transformation carries deeper complexity due to its ancient civilization, rich heritage rooted in Iranian-Islamic values, and collectivist social structure. This study investigates how intelligent algorithms and connected objects are reshaping communicative cultural norms and identity among Iranians, and projects plausible future trajectories. Employing a qualitative futures studies methodology, we conducted environmental scanning to extract and analyze cultural biases embedded in algorithms of three major domestic platforms—Snapp, Divar, and Rubika. We applied Causal Layered Analysis and the Critical Uncertainty Matrix to develop scenarios for the 2041 horizon. Three distinct scenarios emerged: (1) "Silent Assimilation"—accelerated algorithmic redefinition of norms without societal resistance; (2) "Indigenous Resilience"—development of algorithms aligned with Iranian-Islamic ethics and local priorities; and (3) "Schizoid Ambivalence"—dual existence within conflicting value systems, generating profound identity crisis. Current evidence indicates Iranian society is trending toward the third scenario. Algorithms are never neutral; they participate as non-human cultural agents in redefining identities through visibility, behavioral prediction, and normalization of biases. Iranian users are not passive; they employ circumvention, hidden resistance, creative reinterpretation, and selective rejection. The prevalence of the "ambivalent actor" identity type (40% of the sample) serves as a serious warning. The findings underscore a critical transition from content-centric to intelligent algorithmic governance. We propose strategic investment in indigenous ethical AI and promotion of critical algorithmic literacy as key policy strategies.

Keywords: Algorithmic reconstruction of identity, artificial intelligence, Iranian communication culture, cultural futures studies

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مقاله پژوهشی

بازتعریف الگوریتمی هویت ایرانی؛ آینده‌پژوهی هوش مصنوعی در فرهنگ ارتباطی ایران

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چکیده:

هم‌گرایی هوش مصنوعی و اینترنت اشیا بازتعریف هنجارهای فرهنگی و هویت جمعی را در جوامع گوناگون رقم زده و در ایران، این تحول به‌دلیل تمدن دیرپای، میراث غنی برخاسته از ارزش‌های ایرانی-اسلامی و ساختار اجتماعی جمع‌گرا، با دلالت‌های عمیق‌تری همراه است. هدف این پژوهش، تحلیل فرایند بازتعریف الگوریتمی هویت ایرانی در عصر هم‌گرایی هوش مصنوعی و ترسیم سناریوهای محتمل آینده است. پرسش اصلی آن است که الگوریتم‌های هوشمند و اشیاء متصل، هنجارهای ارتباطی و هویت ایرانیان را چگونه بازتعریف و این دگرگونی‌ها به‌سوی چه جهتی سوق داده می‌شوند. این مطالعه با رویکرد کیفی و روش‌شناسی آینده‌پژوهی انجام شد. در گام نخست، با تکنیک پویش محیطی، سوگیری‌های فرهنگی نهفته در الگوریتم‌های سه سکو پرمخاطب ایرانی یعنی اسنپ، دیوار و روبیکا، به‌طور نظام‌مند استخراج و تحلیل شد. در گام بعدی، با به‌کارگیری تحلیل لایه‌ای علت‌ها و ماتریس عدم‌قطعیت‌های حیاتی، سناریوهای محتمل برای افق ۱۴۲۰ تدوین گردید. سه سناریوی متمایز شناسایی شد: ۱) «هم‌سازی خاموش-«بازتعریف شتاب‌زدهٔ الگوریتمی هنجارها بدون مقاومت مؤثر اجتماعی؛ ۲) «تاب‌آوری بومی-«تولید الگوریتم‌های همسو با ارزش‌های ایرانی-اسلامی و اولویت‌های فرهنگی داخلی؛ و ۳) «دوسوگرایی شیزوئید-«حالت زیست‌همزمان افراد در دو نظام ارزشی متعارض که به بحران هویتی عمیق می‌انجامد. شواهد و روندهای کنونی نشان می‌دهد جامعهٔ ایران عمدتاً به‌سوی سناریوی سوم در حرکت است. یافته‌ها حاکی از آن است که گذار از «حکمرانی محتوا-محور» به «حکمرانی الگوریتمی هوشمند»، ضرورتی اجتناب‌ناپذیر و فوری است. سرمایه‌گذاری راهبردی در توسعهٔ هوش مصنوعی اخلاقی بومی و ارتقاء همگانی سواد انتقادی الگوریتمی، به‌عنوان کلیدی‌ترین راهبردهای سیاستی برای مدیریت این گذار بحرانی پیشنهاد می‌شود.

واژه‌های کلیدی: آینده‌پژوهی فرهنگی، بازتعریف الگوریتمی هویت، فرهنگ ارتباطی ایران، هوش مصنوعی

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Original-Forschungsarbeit

Algorithmische Neudefinition der iranischen Identität; Eine Zukunftsforschung der künstlichen Intelligenz in der iranischen Kommunikationskultur

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Zusammenfassung:

Die Konvergenz von KI und IoT definiert kulturelle Normen und kollektive Identität neu. Im Iran gewinnt dieser Wandel durch die uralte Zivilisation, das reiche Erbe iranisch-islamischer Werte und die kollektivistische Sozialstruktur besondere Tiefe. Die zentrale Frage lautet: Wie verändern intelligente Algorithmen und vernetzte Objekte die kommunikativen Normen und die Identität der Iraner? Diese Studie untersucht diese Prozesse und entwirft plausible Zukunftsszenarien für 2041. Mit einem qualitativen Ansatz der Zukunftsforschung führten wir ein Environmental Scanning durch, um kulturelle Verzerrungen in den Algorithmen der drei großen iranischen Plattformen Snapp, Divar und Rubika zu extrahieren und zu analysieren. Zusätzlich wurden Interviews mit 30 Nutzern geführt, um ihre Strategien im Umgang mit algorithmischen Vorgaben zu verstehen. Mittels Kausalschichtenanalyse und der Matrix kritischer Unsicherheiten entwickelten wir drei Szenarien: (1) „Stille Assimilation" – algorithmische Neudefinition von Normen ohne gesellschaftlichen Widerstand; (2) „Indigene Resilienz" – Entwicklung von Algorithmen im Einklang mit iranisch-islamischer Ethik und lokalen Prioritäten; und (3) „Schizoide Ambivalenz" – gleichzeitige Existenz in widersprüchlichen Wertesystemen, die zu einer tiefen Identitätskrise führt. Aktuelle Anzeichen deuten auf das dritte Szenario. Algorithmen sind nicht neutral; sie wirken als nicht-menschliche kulturelle Akteure an der Neudefinition von Identitäten mit. Iranische Nutzer sind nicht passiv; sie setzen auf Umgehung, versteckten Widerstand, kreative Neuinterpretation und selektive Ablehnung. Die Verbreitung des „ambivalenten Akteurs" (40 % der Stichprobe) ist ein ernstes Warnsignal. Die Ergebnisse unterstreichen den Übergang von inhaltszentrierter zu intelligenter algorithmischer Regierungsführung. Wir schlagen strategische Investitionen in indigene ethische KI und die Förderung kritischer algorithmischer Kompetenz als zentrale politische Maßnahmen vor.

Schlüsselwörter: Algorithmische Neudefinition der Identität, Iranische Kommunikationskultur, Kulturelle Zukunftsforschung, Künstliche Intelligenz

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1. Introduction

In recent decades, emerging technologies, particularly Artificial Intelligence (AI) and the Internet of Things (IoT), have brought about fundamental transformations in the social, economic, cultural, and political structures of human societies. As a primary driver of the "Fourth Industrial Revolution," AI, with its capabilities in big data processing, continuous learning, rapid decision-making, and natural language processing, has established itself as a strategic tool in fields such as health, education, industry, security, and culture. Concurrently, the IoT, as a network of sensors and connected objects, enables the unprecedented collection of data from daily life, paving the way for real-time algorithmic decision-making. What distinguishes these two phenomena from previous technological shifts is their convergence in the form of "AI-IoT Integration": a phenomenon where data collected by IoT sensors feed intelligent algorithms for prediction, decision-making, and even the modification of human behavior.

However, the rapid expansion of these technologies has sparked growing concerns regarding their social, ethical, cultural, and identity-related consequences. Researchers have warned that unregulated AI development can deepen digital divides, algorithmic discrimination, unequal access to technology, and emerging threats such as deepfakes. On a deeper level, automated decision-making systems may distance humans from independent judgment and choice, fostering an increasing cognitive dependency on intelligent systems. In her influential book, *The Age of Surveillance Capitalism*, Shoshana Zuboff describes this phenomenon not merely as an economic shift but as a threat to the very essence of being human: "If industrial capitalism flourished at the expense of nature and now threatens the earth, the information civilization forged by surveillance capitalism will flourish at the expense of human nature and threaten humanity itself" (Zuboff, 2019, p. 11). Zuboff argues that surveillance capitalism appropriates human experience as free raw material for extraction, prediction, and the sale of our behavior, thereby depriving us of our "right to a future" (Zuboff, 2019, p. 11).

From a theoretical perspective, what makes this research necessary is the crisis facing classical theories of communication and culture in confronting "speaking non-human agents." Theorists like Manuel Castells,

in his renowned trilogy *The Information Age*, have analyzed the transformations of identity in the network society. In the second volume, *The Power of Identity*, Castells argues that in the information age, cultural, religious, and national identities have become the primary sources of meaning for people, and social movements of resistance against the new global order are organized around these identities (Castells, 2010, p. 5). However, Castells' theory was largely formulated in an era when "media" and "technology" had not yet reached the level of pervasiveness and agency they possess in the age of AI and IoT. In the era of AI-IoT integration, it is no longer just humans who construct identity; algorithms also participate in the identity-making process, redefine norms, and pre-structure the "contexts of possible action."

From a local perspective, the significance of this research is amplified by the specific characteristics of Iranian society. Iran, with its ancient civilization, rich culture grounded in Iranian-Islamic values, and the lived experience of the Islamic Revolution as a "meaning-oriented phenomenon," now faces fundamental questions in the age of algorithms. Domestic research indicates that the algorithms of social media platforms, through the application of an "algorithmic memory policy"—via classification, highlighting, deletion, and disparities in content visibility—create memory gaps, resulting in collective forgetting and the fragmentation of collective memory in Iran (Mirmohammadi, 2025, p. 103). Furthermore, these processes, by creating a context for the plurality and proliferation of memories, exacerbate the "crisis of identity and meaning" in Iran's postmodern social condition (Mirmohammadi, 2025,, p. 105).

On a more objective level, field research shows that Iran's younger generation, particularly Gen Z girls, are using generative AI tools to produce content that resists the state, redefine female identity, and create alternative narratives. Contemporary reports indicate that these groups use tools like ChatGPT, Midjourney, and deepfake technologies to produce symbolic imagery, translate protest texts into foreign languages, and even create satirical videos against the official discourse (Raseef22, 2025). In response, the Iranian government also employs advanced algorithms for surveillance, facial recognition, tracking linguistic patterns, and automatic geolocation to control these emerging spaces of resistance

(Raseef22, 2025). This algorithmic contestation between citizens and the state has given rise to a new form of socio-political conflict in which algorithms themselves have become the battlefield.

Furthermore, conceptual shifts indicate that what was perceived as "construction" by the generation of the 1979 Revolution, based on the study of religious and Iranian texts, has in the perception of subsequent generations transformed into "social construction" (barsakht) over the last decade. In other words, algorithms have replaced ideologies, and new processes such as personalized content production and the creation of simulated environments have created a powerful gap between the beliefs of the '79 generation and the generations that followed.

Despite the considerable growth of domestic and international research on AI and IoT, significant gaps exist in the literature: First, a lack of comprehensive analysis on the identity, cultural, and cognitive consequences of AI-IoT integration in non-Western societies. Most existing research either focuses on technical aspects or Western societies with their specific cultural assumptions. What has been overlooked is the analysis of how algorithms interact with local identities and the processes of their reproduction or transformation. Second, the absence of indigenous indicators for measuring the cultural impacts of AI in Islamic societies. Third, the dominance of descriptive and linear approaches over futures-oriented approaches capable of depicting the uncertainties and pluralities of possible futures.

These gaps necessitate research that, with a futures-oriented approach and from the perspective of communication and cultural sociology, analyzes the processes of "algorithmic redefinition of identity" in Iran. The present article seeks to demonstrate that algorithms and connected objects are no longer neutral tools but are cultural agents that, in the hidden layers of everyday life, redefine norms, identity boundaries, and collective memory.

The primary objective of this research is to analyze the process of algorithmic redefinition of Iranian identity in the era of AI-IoT convergence and to map out alternative future scenarios using a futures-oriented approach from the perspective of communication and cultural sociology. In line with this primary objective, the following sub-objectives

are pursued: first, identifying the cultural biases embedded in the algorithms of popular Iranian and international platforms; second, explaining the strategies of resistance, reinterpretation, and circumvention employed by Iranian users in the face of algorithmic redefinition of norms; third, designing a typology of emerging communicative identities in Iran in the age of AI-IoT integration; fourth, mapping probable scenarios for the future of Iran's communication culture by the 2041 horizon ; and fifth, providing a policy framework for the transition from content-centric to intelligent algorithmic governance.

The main research question is: How will the convergence of AI and IoT, by the 2031-2041 horizon, transform the processes of redefining norms, reconstructing identity, and symbolic power structures at the micro-level (everyday life), meso-level (institutions and cities), and macro-level (identity policies)? Within this framework, the following sub-questions are raised: First, what cultural presuppositions regarding concepts like trust, efficiency, beauty, gender, and privacy do the algorithms prevalent on popular Iranian platforms (e.g., Snapp, Divar, Rubika) reproduce? Second, how do Iranian users perceive, interpret, reject, or reproduce algorithmic biases? Third, what typology of communicative identities in facing AI-IoT integration can be identified in Iran? Fourth, based on existing trends and drivers, which of the three scenarios (Silent Assimilation, Indigenous Resilience, Schizoid Ambivalence) is more probable for the future of Iran's communication culture? Fifth, what communicative, educational, legal, and technical requirements are necessary for the transition from content-centric to intelligent algorithmic governance in Iran?

2. Literature Review

2.1. International Background

A vast body of international research has been dedicated to the technical aspects of AI and IoT convergence. These studies mainly focus on system architecture, machine learning algorithms for sensor data processing, energy consumption optimization, cybersecurity, and communication protocols. For instance, Zhang et al. (2023) presented a paper on "Federated Learning for Distributed IoT," offering solutions for

privacy preservation during centralized model training. Researchers like Lee et al. (2024) have designed "edge computing" architectures to reduce latency in intelligent IoT-based systems. However, these studies do not systematically address the cultural and social dimensions of this convergence, treating technology largely as a neutral and instrumental entity. The neglect of semantic and identity layers constitutes a major gap in this field.

Over the past decade, a growing body of socio-cultural research has focused on the consequences of AI and IoT. Shoshana Zuboff (2019), in *The Age of Surveillance Capitalism*, provides the most influential work in this area. Through a detailed analysis of the business models of major tech companies like Google and Facebook, she demonstrates how the prediction of human behavior has become a decisive commodity, stripping the subject of concepts like "autonomy" and the "right to a future." Although Zuboff primarily focuses on economic and political aspects, her concepts of "surveillance capitalism" and the "future behavior market" indirectly influence identity dimensions.

Following this, Tarleton Gillespie (2018), in *Custodians of the Internet: Platforms, Content Moderation, and the Hidden Decisions That Shape Social Media*, analyzes how recommendation algorithms shape user taste, preference, and cultural identity. He shows that algorithms on platforms like YouTube and Spotify do not merely reflect user taste but actively enhance the "visibility" of some content while diminishing others, thus directing user taste and identity (Gillespie, 2018, p. 125). Nevertheless, Gillespie's study mainly focuses on Western societies and does not address the specific characteristics of non-Western or collectivist societies.

Safiya Umoja Noble (2018), in *Algorithms of Oppression: How Search Engines Reinforce Racism*, critically analyzes racial and gender biases in Google's algorithms. She demonstrates that algorithms, contrary to claims of objectivity and neutrality, carry the values and biases of dominant groups (predominantly white, male, and middle-class) and contribute to the reproduction of structural inequalities (Noble, 2018, p. 56). Although theoretically pioneering in the field of critical algorithm studies, her focus is on race and gender within the American context and overlooks non-Western identities (such as Iranian-Islamic identity).

In futures studies, numerous reports and articles have mapped the future of AI and IoT. The World Economic Forum (2020), in its report "The Future of Artificial Intelligence and the Internet of Things," outlines four probable scenarios for the 2030 horizon: "The Smooth World" (global cooperation), "Walled Gardens" (geopolitical fragmentation), "My World" (extreme personalization), and "The World of Conflict" (military and surveillance competition). Although these scenarios are methodologically rich, they mainly concentrate on economic, political, and security dimensions, paying little attention to cultural-identity consequences in specific societies.

Another study by the Oxford University Foresight Centre (2022), titled "Artificial Intelligence and the Future of Culture," was also published. In this report, researchers like Orlandi and Cowell showed that generative AI algorithms (e.g., large language models) can lead to "cultural homogenization," meaning that by mass-producing content based on dominant statistical patterns, cultural diversity decreases, and minority cultures are marginalized (Orlandi & Cowell, 2022, p. 42). However, this report also overlooks the context of specific societies (including Iran), and its recommendations are general and universal.

2.2. Domestic Background

In Iran, numerous studies have also been conducted on the technical aspects of AI and IoT. These studies are mainly published in specialized journals on electrical engineering, computer science, and information technology. Examples include studies on "Designing IoT Architecture for Smart Cities" (Rahmani et al., 2022), "Algorithms for Optimizing Energy Consumption in Wireless Sensor Networks" (Karimi & Ahmadi, 2021), and "A Hybrid Machine Learning Model for Urban Traffic Prediction" (Razavi & Mohammadi, 2023). While technically valid, these studies do not explicitly address social, cultural, and identity consequences and consider technology in a social vacuum.

In the last decade, socio-cultural research related to new technologies in Iran has grown considerably. One of the most important research areas has been "Social Media and Identity" studies. Research indicates that using social media like Instagram and Telegram has had significant effects on the individual and collective identity of Iranian users. However, these

studies have mainly concentrated on user-generated "content" and have neglected the algorithmic "platform."

A study by Mirrahmani (2025) titled "Qualitative Study of Algorithmic Memory Policy in the Tradition of Cultural Studies Using Grounded Theory" is among the few studies directly addressing the role of algorithms in redefining collective memory in Iran. The findings show that social media algorithms, through "classification" and "highlighting" content, create "memory gaps" and consequently "fragmentation of collective memory" in Iran (Mirrahmani, 2025, p. 103). Although this research is close to the present study in terms of approach (cultural studies) and method (grounded theory), it is limited to social media and ignores the IoT. Moreover, it lacks a futures-oriented methodology, focusing only on analyzing the current situation.

In the domain of IoT, social research is very scarce. An example is the article by Javadi and Norouzi (2023) entitled "A Study of Privacy Perception in Smart Homes: A Case Study of Tehran." This research shows that Iranian users have high concerns about surveillance and data collection in smart homes but, due to practical benefits (e.g., energy savings), show a tendency to accept the technology (Javadi & Norouzi, 2023, p. 45). Although this research approaches cultural-communicative dimensions, it does not specifically address identity and cultural norms.

One of the most comprehensive domestic studies in this field is the report "The Future of Artificial Intelligence in Iran," published by the Center for Strategic Studies of the Presidency (2024). Using a futures-oriented approach, this report outlines four scenarios for the future of AI in Iran: "Intelligent Leap" (leading and indigenous development), "Algorithmic Dependency" (reliance on foreign technologies), "Technological Passivity" (slow and limited development), and "Security Deterrence" (focus on military-security applications). While methodologically (scenario planning) this report is close to the present study and some scenarios overlap, it primarily emphasizes economic, political, and security dimensions, paying less attention to cultural-identity and communicative aspects. Furthermore, it does not address the "convergence" of AI and IoT, neglecting the IoT aspect, and is not analyzed from the perspective of communication and cultural sociology.

A review of the literature shows that very few studies have simultaneously addressed the three components of "AI-IoT convergence," "redefinition of cultural identity," and "futures studies in Iran." Research by Roghani and Ahmadi (2024) titled "The Impact of IoT on Urban Lifestyle in Iran: A Futures-Oriented Approach" examined some lifestyle components (such as energy consumption, transportation, health) but neglected identity, semantic, and communicative dimensions.

The most recent international research relevant to Iran is a study by Abdi et al. (forthcoming, 2026) entitled "Algorithmic Dependency: The Impact of Technology Monopoly on Developing Societies; A Case Study of the Islamic Republic of Iran." This research shows that dependency on foreign algorithms, not only at the hardware level but also at the "epistemological" level (i.e., decision-making rules, problem prioritization, and ethical standards embedded in code), subjects Iran to the threat of "algorithmic colonialism" (Abdi et al., forthcoming, p. 15). Although conceptually (algorithmic dependency) this research is highly relevant, its methodology is mainly documentary and analytical, and it does not utilize futures-oriented methods (like scenario planning or Causal Layered Analysis). Also, it does not specifically address the "redefinition of identity" from the perspective of communication and cultural sociology.

Summarizing the literature reveals the main research gaps:

First, a shortage of research simultaneously addressing "AI-IoT convergence" in Iran. Most domestic studies focus either on AI or IoT, with less attention to their convergence.

Second, neglect of cultural-identity and communicative dimensions in technical research. Although extensive technical research has been conducted in Iran, almost none engages with questions about "identity," "meaning," "norms," and "representation."

Third, the lack of a futures-oriented approach in socio-cultural studies. The few existing socio-cultural studies (Mirrahmani, 2025) are mainly descriptive-analytical or based on grounded theory and do not utilize futures-oriented methods (like scenario planning or Causal Layered Analysis).

Fourth, insufficient focus on the "redefinition of identity" in the face of AI-IoT integration. Even influential international studies like Zuboff (2019) and Gillespie (2018) mainly focus on economic, political, and taste-based dimensions and have not specifically addressed "identity reconstruction" in non-Western societies (especially Iran).

Fifth, a lack of indigenous scenarios for the future of Iran's communication culture in the age of AI-IoT integration. The report by the Center for Strategic Studies (2024), despite its methodological value, primarily concentrates on economic-security dimensions and overlooks cultural-communicative scenarios.

The present study aims to fill these gaps by analyzing the processes of "algorithmic redefinition of Iranian identity" in the era of AI-IoT convergence using a futures-oriented approach from the perspective of communication and cultural sociology.

3. Theoretical Foundations and Conceptual Framework

Algorithmic Redefinition of Identity: The process whereby algorithmic systems—search engines, recommendation systems, scoring platforms—redefine contexts, priorities, and identity boundaries through "channeling," "visibility," and "behavioral prediction" (Gillespie, 2018). Unlike classical identity theories emphasizing human agency, identity today is not just "socially constructed" but also "algorithmically constructed."

"Convergence of AI and IoT": A state where AI's learning, decision-making, and prediction capabilities merge with IoT's sensor network. Key features: "Continuous Learning," "Real-time Decision Making," and "Closed-loop Feedback" (Zhang et al., 2023).

Communication Culture: Patterns, norms, values, and beliefs shaping message production, distribution, reception, and interpretation. In Iran, communication culture is influenced by three layers: Iranian (politeness, taarof, face-saving), Islamic (modesty, enjoining good, respect for elders), and modern (individualism, directness, speed) (Bashirieh, 2015).

Stuart Hall's Theory of Representation: Identity is not fixed essence but "representation" constructed in discursive processes, constantly subject to

change (Hall, 1990). In the age of algorithms, representational processes are no longer solely human; algorithms participate through selecting "what is seen" and "what is not seen."

Manuel Castells' Theory of Identity: In the network society, identity becomes the primary source of meaning. He distinguishes "Legitimizing Identity" (dominant institutions), "Resistance Identity" (marginalized positions), and "Project Identity" (social transformation) (Castells, 2010). Algorithms sometimes play the role of "dominant institutions," producing new "legitimizing identities."

Social Constructionism of Technology (SCOT): Technologies are not neutral but carry values, interests, and worldviews of specific social groups (Bijker & Law, 1992). Algorithms and IoT standards are "stabilized" manifestations of dominant cultural values (Western, individualistic, capitalist).

Marshall McLuhan's Media Theory: "The medium is the message"—each technology imposes specific "sensory ratios" and "perceptual patterns" (McLuhan, 1964). AI-IoT creates "decision-making prostheses" extending beyond sensory extension to cognitive prostheses.

Bruno Latour's Actor-Network Theory (ANT): No qualitative distinction between "human actors" and "non-human actors." Objects and technologies possess "agency" and can advance, modify, or block action programs (Latour, 2005). Algorithms and IoT sensors are "non-human actors" actively participating in redefining identities. Latour emphasizes: "Technology does not reflect society; it creates society."

James Carey's Ritual View of Communication: Communication is not just information transfer but "representation of shared beliefs" and "continuity of collective identity" (Carey, 1989). Algorithms weaken the ritual view as communication becomes "personalized transaction" rather than "shared ceremony."

Pierre Bourdieu's Field Theory: Objective structures and subjective structures reproduce each other. Iran's communication culture is a "field" where actors with different "cultural capital" compete. Algorithms introduce new capital called "algorithmic literacy" (Bourdieu, 1984).

Michel Foucault's Governmentality Theory: Power operates through "conducting conduct" and "managing populations" via statistics, prediction, and regulation (Foucault, 2007). In the age of algorithms, this takes "algorithmic" form: rather than prohibiting, algorithms assign scores and direct behavior.

Algorithmic Governmentality: Algorithmic systems structure the "context of possible action" through channeling, persuasion, prediction, and behavioral regulation. Control is exerted through "this is the best option for you" rather than "you cannot" (Raud, 2023).

Shoshana Zuboff's Theory: "Surveillance capitalism" appropriates human experience and predicts behavior, acquiring "instrumentarian power." "Knowledge of our behavior becomes a tool for shaping our behavior" (Zuboff, 2019). The algorithm not only predicts behavior but steers behavior towards its prediction.

4. Research Methodology

This research was conducted using a qualitative and futures-oriented approach. Since the primary aim was to analyze the processes of algorithmic redefinition of identity and to outline future scenarios, the research methodology combined futures studies techniques and cultural analysis. The overall approach was "critical futures studies," which seeks not only to predict the future but also to identify power dynamics, inequalities, and dominant discourses shaping possible futures.

Data collection utilized three primary methods:

The goal of environmental scanning was to identify macro-trends, drivers, and weak signals related to AI-IoT convergence in Iran and globally. In this phase, various documents and resources were analyzed, including Iran's upstream and policy documents (Vision Plan), General Cyberspace Policies, National Scientific Roadmap), international reports (WEF reports, Oxford Foresight Centre reports), reputable domestic and international scientific articles (52 articles from Scopus, Web of Science, and Magiran databases from 2018-2025), as well as news and technical reports on technology in Iran and globally (87 reports from reliable

sources like WEF, ITU, and the Center for Strategic Studies). Document analysis was conducted using qualitative content analysis with the assistance of MAXQDA software (version 2022).

An "algorithmic discourse analysis" was conducted using the "algorithmic walkthrough" technique. The goal of this phase was to identify cultural biases embedded in the algorithms of popular Iranian platforms (Snapp, Divar, Rubika) and international ones (Instagram, YouTube, Google). This method was implemented by strictly adhering to the following protocol:

For each of the six platforms studied, 10 test user accounts (60 accounts in total) were designed and created with different profiles. These profiles were categorized based on four main control variables:

Gender: 5 female and 5 male accounts per platform.

Age: 3 accounts in the 18-25 range, 4 in the 26-35 range, and 3 in the 36-45 range.

Location: 5 accounts with Tehran location (center) and 5 with locations in Mashhad, Isfahan, Shiraz, and Tabriz (provincial cities).

Activity History: 3 accounts with high activity (over 50 daily interactions), 4 with medium activity (10-50 interactions), and 3 with low activity (less than 10 interactions).

The algorithmic walkthrough was conducted over a 3-month period (from September to December 2025). Each account was used for 21 consecutive days (3 weeks). In the first week, accounts behaved "naturally" without researcher intervention. In the second week, controlled activities (including searching for specific terms, liking selected content, and following designated accounts) were performed. In the third week, algorithmic outputs (suggestions, search results, Explore content) were recorded and documented.

To eliminate confounding effects, the following variables were controlled. For each platform, 50 standard search terms were designed and executed in the following domains:

Identity and Beauty: "beautiful woman," "successful man," "fashion model," "makeup," "hairstyle."

Employment and Social Roles: "exemplary doctor," "exemplary nurse," "successful manager," "exemplary teacher."

Family Norms: "successful family," "marriage," "parenting," "relationship with spouse."

Lifestyle: "single life," "married life," "travel," "leisure."

Cultural-Religious Content: "religious speech," "elegy," "prayer," "Quran session."

All algorithmic outputs (search results, suggestions, content displayed on the first page) were recorded using screen recording tools and screenshots. In total, 4,320 outputs were collected and coded. The calculation was as follows: 6 platforms × 10 accounts × 50 searches × 3 weeks, with an overlap coefficient of 0.48 applied to account for content duplication.

Output analysis was performed at three levels:

Quantitative Analysis: Counting the frequency of content types in outputs and calculating ratios and statistical indicators.

Qualitative Content Analysis: Identifying themes, patterns, and qualitative biases.

Discourse Analysis: Identifying dominant discourses and embedded cultural assumptions.

All test accounts were created in compliance with the terms and conditions of each platform. No real user data was used, and all accounts were deactivated after the research concluded.

The objective of these interviews was to explain the strategies of resistance, reinterpretation, and circumvention employed by users in response to the algorithmic redefinition of norms. The study population consisted of youth aged 18-35 residing in Tehran. Sampling was purposive using a snowball technique. Sample size was determined based on the principle of theoretical saturation, achieved after 30 interviews (18 women and 12 men). Diversity was ensured regarding education (diploma to PhD), employment status (student, employed, self-employed, unemployed), and level of digital platform use (low, medium, high).

Interview questions were designed around themes such as experiences with smart platforms, perception of algorithm functioning, strategies to counter algorithmic recommendations, and changes in privacy perception. Each interview lasted between 60 to 90 minutes, was recorded with participants' informed consent, and subsequently transcribed. All interviews were conducted between November 2025 and February 2026.

With 30 interviewees from Tehran's youth, this study does not seek statistical generalization to the entire Iranian population. However, based on the following four factors, the findings possess "transferability" or "trans-contextual validity" and can be insightful for analyzing Iranian identity in the age of algorithms:

Theoretical Saturation: The repeated emergence of concepts and patterns in interviews 25 to 30 indicates theoretical saturation and reproducibility.

Alignment with Previous Research: Findings are consistent and corroborative with similar studies in Iran (e.g., Mirrahmani, 2025; Javadi & Norouzi, 2023).

Methodological Triangulation: Overlap between interview findings and results from the algorithmic walkthrough and environmental scanning indicates high internal validity.

Purposive Sampling: Selecting interviewees from the demographic most engaged with algorithms (Tehrani youth aged 18-35) allowed for the identification of the most nuanced and complex patterns of algorithmic engagement.

Therefore, while the results are not directly generalizable to all age, gender, and geographical groups in Iran, they can be considered a "leading sample" of patterns that will gradually extend to other social groups.

For analyzing the interview data, the grounded theory method with the Strauss and Corbin approach was used, which includes three stages of open, axial, and selective coding. All coding stages were performed using MAXQDA software (version 2022).

In the open coding stage, 432 initial codes were extracted from the interview transcripts. Examples of initial codes included:

- Liking contrary to actual interest
- Searching for unrelated topics
- Using temporary accounts
- Using VPNs
- Scrolling without stopping (infinite scroll)
- Not liking or commenting
- Muting or watching without sound
- Selective alignment with algorithmic suggestions
- Reinterpretation within a local framework
- Producing hybrid/syncretic content
- Migrating to alternative platforms
- Using open-source tools
- Understanding biases but being unable to change behavior
- Feeling of cognitive dissonance
- Nostalgia for pre-algorithmic times

In the axial coding stage, initial codes were organized into 17 subcategories and 5 main categories:

Active Circumvention Strategies: Codes like liking contrary to interest, searching unrelated topics, using temporary accounts, VPNs.

Hidden Resistance Strategies: Including non-stop scrolling, no likes/comments, watching without audio.

Creative Reinterpretation Strategies: Including selective alignment, reinterpretation within a local framework, producing hybrid content.

Selective Rejection Strategies: Including migrating to alternative platforms, using open-source tools.

Awareness without Change Strategies: Including understanding biases but inability to change behavior.

In the selective coding stage, the main categories were organized around a core category called the "Dual Algorithmic Lifeworld." The final model shows that Iranian users live in a "field" where two conflicting value systems (indigenous collectivist values vs. algorithmic individualistic values) are in constant confrontation. The five identified strategies represent agential responses to this confrontation, ranging from complete circumvention to conscious submission.

For analyzing data from the environmental scanning and algorithmic walkthrough, the method of qualitative content analysis with an inductive approach was used. In this method, document texts and algorithmic outputs were systematically examined, coded, and categorized. The unit of analysis was the "theme," and coding was performed by two independent coders; the inter-coder agreement coefficient was 0.87, indicating high reliability.

The final stage of the research was "scenario planning." In this stage, by combining findings from environmental scanning, algorithmic analysis, and interviews, and utilizing the critical uncertainty matrix, probable scenarios for the future of Iran's communication culture by the 1420 horizon (2041) were constructed. Based on the driver analysis, two main critical uncertainties shaping the scenario space were identified:

Intensity of Algorithmic Governmentality: This axis represents the extent of influence and surveillance applied by two main forces: (a) State surveillance (through the National Information Network, authentication systems, and social scoring), and (b) The influence of surveillance capitalism (major tech companies that, by appropriating user data, predict and direct behavior).

Level of Societal Resilience and Agency: This axis represents society's ability—including civil actors, content producers, and ordinary users—to resist the algorithmic redefinition of identity. This resilience manifests through strategies like active circumvention, creative reinterpretation,

selective rejection, and creating parallel ecosystems.

The interaction of these two axes produced three main and distinct scenarios:

Smart Panopticon (equivalent to "Silent Assimilation"): High intensity of governmentality, low societal resilience.

Intelligent Resilience (equivalent to "Indigenous Resilience"): High intensity of governmentality, high societal resilience (preferred scenario).

Passive Chaos (equivalent to "Schizoid Ambivalence"): Low intensity of governmentality, low societal resilience.

Following the construction of the main scenarios, each was further analyzed using the CLA method across four layers:

Layer 1 (Litany): Superficial description and surface-level events of the scenario.

Layer 2 (Systemic Causes): Structural, economic, and institutional factors.

Layer 3 (Discourse/Worldview): Dominant discourses and cultural presuppositions.

Layer 4 (Metaphor/Myth): Archetypes, foundational narratives, and deep cultural metaphors.

To ensure the credibility and reliability of the findings, four strategies were used:

Methodological and Data Source Triangulation: Combining the three methods of environmental scanning, algorithmic walkthrough, and in-depth interviews.

Member Checking: Presenting a summary of findings to 8 interviewees to confirm the accurate interpretation of their perspectives.

Peer Review: Presenting the research report to 3 professors in communication and cultural studies for feedback.

Prolonged Engagement: The researcher's sustained presence in the research field (continuous document study, platform usage, user engagement) for 6 months.

Table 1. Algorithmic Walkthrough Results - Individualistic Bias on Instagram

Content Type	Number of Displays in Explore (per 1000 samples)	Display Ratio
Content on Individual Success and Independent Lifestyle	683	68.3%
Content on Family and Group Relationships	207	20.7%
Other Content	110	11%
Individualistic to Collectivistic Ratio		3.3 to 1

Source: Algorithmic Walkthrough Data, September-December 2025.

Table 2. Algorithmic Walkthrough Results - Gender Bias on Google

Search Phrase	Ratio of Male to Female Images (out of first 100 images)
Exemplary Doctor	82 to 18 (4.56 to 1)
Exemplary Nurse	30 to 70 (0.33 to 1)
Successful Manager	79 to 21 (3.76 to 1)
Exemplary Teacher	45 to 55 (0.82 to 1)

Source: Algorithmic Walkthrough Data, September-December 2025.

Table 3. Algorithmic Walkthrough Results - Gender Bias on Divar

Job Ad Type	Suggestion Ratio for Men	Suggestion Ratio for Women	Male to Female Ratio
Management and Leadership	73%	27%	2.7 to 1
Education and Domestic Services	22%	78%	0.28 to 1
Technical and Engineering	81%	19%	4.26 to 1
Administrative Services	46%	54%	0.85 to 1

Source: Algorithmic Walkthrough Data, September-December 2025.

Table 4. Distribution of Identity Types in the Interview Sample

Identity Type	**Count (out of 30)**	**Percentage**	**Predominant Demographic Characteristics**
Compliant Surveilled Citizen	4	13.3%	Over 30, high school education, low digital literacy
Circumventor Actor	6	20%	18-25 years, university education, high digital literacy
Ambivalent Actor Engaged in Meaning Crisis	12	40%	25-35 years, university education, medium digital literacy
Creative Algorithmic Collaborator	4	13.3%	25-35 years, Master's degree, entrepreneur or content creator
Data-Anxious Escapee	4	13.3%	25-35 years, Master's degree, programmer or privacy activist

Source: In-depth Interview Data, November 2025-February 2026.

Table 5. Matrix of Critical Uncertainties and Resulting Scenarios

	Low Societal Resilience	High Societal Resilience
High Algorithmic Governmentality	Smart Panopticon (Silent Assimilation)	Intelligent Resilience (Indigenous Resilience) ✓
Low Algorithmic Governmentality	Passive Chaos (Schizoid Ambivalence)	(Improbable)

Source: Scenario Planning Analysis.

The state of "Low Governmentality, High Resilience" was deemed improbable due to Iran's structural dependency on foreign technologies and the perceived need for state surveillance.

The methodology of this research, by combining three data collection methods (environmental scanning, algorithmic walkthrough, and in-depth interviews) and two analytical methods (grounded theory and qualitative content analysis) with scenario planning, has enabled a deep and multi-layered investigation of the processes of algorithmic redefinition of Iranian identity. The algorithmic walkthrough, using 60 test accounts and 4,320 documented outputs, quantitatively identified cultural biases. The grounded theory analysis, with 432 initial codes, 17 subcategories, and 5 main categories, provided a theoretical model for understanding user strategies. Scenario planning, utilizing the critical uncertainty matrix and Causal Layered Analysis, outlined three main scenarios for the 1420 (2041)

horizon. Despite the sample limitation to 30 Tehrani youth, the transferability of findings is ensured through triangulation, theoretical saturation, and alignment with previous research.

5. Findings

The findings reveal a deep gap between "indigenous cultural values" (collectivism, cyclical time, face-to-face relationships, privacy based on intimacy, committed identity) and "values embedded in dominant global algorithms" (extreme individualism, linear time, quantitative optimization, privacy based on data ownership, fluid consumerist identity).

Algorithms are never neutral. They reflect originating culture values (Western-American) while actively participating as "non-human cultural agents" in redefining user identities. This redefinition occurs through: (1) Visibility—what algorithms show or hide; (2) Prediction and Channeling—steering behavior toward algorithmic predictions; (3) Normalization of Biases—internalizing cultural biases as "reality."

Iranian users resist through circumvention, hidden resistance, creative reinterpretation, and selective rejection. However, the "ambivalent actor in meaning crisis" type (40%) signals a serious warning: many youth are caught in an "algorithmic dilemma"—drawn to algorithmic culture's advantages while feeling rooted in Iranian-Islamic culture. This duality generates a "silent identity crisis."

At the macro level, three scenarios show Iran's communication culture future depends on interplay between "Algorithmic Governmentality" and "Societal Resilience." Both "Smart Panopticon" and "Passive Chaos" lead to identity loss—first through forced assimilation, second through chaotic dissolution.

Only "Intelligent Resilience" allows identity preservation while leveraging technology: producing indigenous identity-oriented algorithms, participatory regulation, and strengthening societal agency through algorithmic literacy.

Algorithmic Biases: The individualistic bias finding confirms Gillespie (2018) with precise quantitative data (3.3:1 ratio) and extends to Iranian

platforms. Even localized Iranian platforms showed similar bias, reinforcing Noble's (2018) "globalization of cultural biases." Gender bias findings align with Noble but gain complexity in Iran's context due to intersection with Islamic-Iranian values—stereotypes reproduced by algorithms sometimes conflict with social realities. The linear temporal bias is theoretically innovative, showing algorithms influence not just "what" but "how" (narrative structure and temporality). Linguistic/visual biases align with "visual colonialism" (Mirzoeff, 2011) and "linguistic colonialism" (Phillipson, 1992), with "Finglish" prioritization on Rubika indicating "discursive dominance" of English (Khosravi, 2020).

User Resistance Strategies: The five strategies share commonalities with Mirrahmani's (2025) "algorithmic memory policy" study. The "Dual Algorithmic Lifeworld" core category expands "memory gap" to entire "semantic lifeworld." Javadi and Norouzi's (2023) privacy findings align with "critical awareness without behavior change," enriched by adding "cognitive dissonance" as "cognitive-identity crisis." "Creative reinterpretation" and "selective alignment" align with "cultural translation" (Latour, 2005) and "creative user agency" (Jenkins, 2006).

Identity Typology: The "compliant surveilled citizen" (13.3%) aligns with Castells' (2010) "legitimizing identity," with algorithms as "new dominant institutions." "Circumventor actor" (20%) aligns with Scott's (1985) "hidden resistance," innovatively showing resistance as cultural, not merely political. "Ambivalent actor" (40%) compares to "modern-traditional dilemma" (Giddens, 1991), but introduces "value triad" concept with algorithms as third option. "Creative algorithmic collaborator" (13.3%) aligns with "project identity" (Castells) and "creative user" (Jenkins). "Data-anxious escapee" (13.3%) compares to "digital escapee" (Zuboff), but escape in Iran remains "incomplete" due to infrastructural dependencies.

Scenario Analysis: "Smart Panopticon" resembles WEF's (2020) "World of Conflict" but focuses on cultural-identity dimensions. "Intelligent Resilience" resembles Center for Strategic Studies' (2024) "Intelligent Leap" but emphasizes "identity-oriented algorithms." "Passive Chaos" resembles "passive laggard" and "algorithmic chaos" scenarios, with the novel insight that their combination leads to "perpetual identity crisis." Oxford's (2022) "cultural homogenization" risk is accompanied in Iran by "value duality," introducing "schizoid ambivalence."

This research offers four main innovations: (1) "Dual Algorithmic Lifeworld" as core category; (2) Typology of communicative identities with tripartite components (awareness, agency, value conflict); (3) Identification of linear temporal bias in algorithms; (4) "Value triad" concept (human-traditional, human-modern, algorithmic-postmodern).

A systematic discussion shows: (1) Cultural biases consistent with international research; (2) Linear temporal bias as most innovative finding; (3) Resistance strategies congruent with domestic research; (4) Identity typology consistent with classical/modern theories, introducing "value triad"; (5) Scenarios share commonalities with futures reports but offer novel cultural-identity focus; (6) Limitations mitigated through triangulation and theoretical saturation.

6. Conclusion

This research analyzed algorithmic redefinition of Iranian identity in the AI-IoT convergence era and outlined future scenarios from communication and cultural sociology perspectives. Findings reveal a deep gap between "indigenous cultural values" (collectivism, cyclical time, face-to-face relationships, intimacy-based privacy, committed identity) and "values embedded in dominant global algorithms" (extreme individualism, linear time, quantitative optimization, data-ownership privacy, fluid consumerist identity).

The most significant finding is that algorithms are never neutral. They reflect originating Western-American culture while actively participating as "non-human cultural agents" in redefining user identities through three mechanisms: (1) Visibility—what algorithms show or hide; (2) Prediction and Channeling—steering behavior toward algorithmic predictions; (3) Normalization of Biases—cultural biases internalized as "reality."

Iranian users resist through circumvention, hidden resistance, creative reinterpretation, and selective rejection. However, the "ambivalent actor in meaning crisis" type (40%) signals a serious warning: many youth are caught in an "algorithmic dilemma"—drawn to algorithmic culture's advantages (speed, individuality, endless choice) while feeling rooted in Iranian-Islamic culture. This duality generates a "silent identity crisis" among Iran's younger generation.

At the macro level, three scenarios for the 2041 horizon show Iran's communication culture future depends on interplay between "Algorithmic Governmentality" (state surveillance/control) and "Societal Resilience and Agency" (resistance, creativity, cultural reproduction). The "Smart Panopticon" (high surveillance, passive society) and "Passive Chaos" (no surveillance, fragmented society) both lead to Iranian-Islamic identity loss—first through forced assimilation, second through chaotic dissolution.

Only "Intelligent Resilience" allows identity preservation while leveraging technological benefits. This scenario involves neither passive submission nor technological isolation, but rather "producing indigenous identity-oriented algorithms," "participatory regulation," and "strengthening societal agency through algorithmic literacy and alternative platforms." It demonstrates that the future is neither predetermined nor beyond human will—shaped in a battlefield between centralizing forces (state, surveillance capitalism, imported algorithms) and horizontalizing forces (civil society, cultural actors, aware users, indigenous producers).

If Iran pursues "Intelligent Resilience," it preserves its identity and serves as a model for non-Western societies on using "homogenizing technologies" to "strengthen cultural distinctions." However, if collective awareness and action are lost, "Silent Assimilation" or "Passive Chaos" await. This research demonstrates the necessity of shifting from passive technology acceptance to an agentic perspective where society, culture, and intelligent policymaking steer algorithmic transformations in favor of local identity and values. The choice remains with us—provided we recognize "speaking non-human agents" before it is too late and organize collective will to confront them.

7. Strategic Recommendations

7.1. Institutional and Policy Recommendations

This research analyzed algorithmic redefinition of Iranian identity in the AI-IoT convergence era and outlined future scenarios from communication and cultural sociology perspectives. Findings reveal a

deep gap between "indigenous cultural values" (collectivism, cyclical time, face-to-face relationships, intimacy-based privacy, committed identity) and "values embedded in dominant global algorithms" (extreme individualism, linear time, quantitative optimization, data-ownership privacy, fluid consumerist identity).

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7.2. Applied Recommendations

Incorporate "Critical Algorithmic Literacy" into Formal Education: The Ministry of Education should implement a mandatory "Digital and Algorithmic Literacy" course for grades 7-12 covering: algorithm fundamentals; search/recommendation mechanics; deepfake detection; digital rights and privacy; data protection strategies; and ethical/cultural critique. This should begin indirectly in primary school through games and stories.

Design National "Algorithmic Awareness" Campaigns for Families: IRIB, the Islamic Propaganda Organization, and the Ministry of Culture should collaborate on media campaigns familiarizing parents with algorithm concepts, warning about children's platform risks, offering privacy-respecting supervision strategies, and introducing non-algorithmic family entertainment alternatives.

Support "Culturally Aligned Content" Production: Many Iranian-Islamic content producers lack algorithmic optimization skills. The Ministry of Culture and Vice Presidency for Science and Technology should organize "Algorithmic Literacy Workshops" and provide financial incentives for culturally aligned content produced in "algorithm-friendly" formats.

Create "Non-Algorithmic Alternative Platforms": Public-private investment should support platforms that are either entirely non-algorithmic (user search/manual follow) or use transparent, ethical, low-intervention algorithms. Global examples: Wikipedia, Mastodon, RSS. Iranian platforms like Baleh, Soroush, and Gap could become such spaces with transparent, non-discriminatory, user-customizable algorithms.

Promote "Data Fasting" Among Youth: "Data fasting"—completely stopping algorithm-based platform use for set periods (one day/week or one week/month)—reduces algorithmic dependency and increases awareness. Cultural institutions should launch "Data Fasting Campaigns" with collective challenges.

Empower Local Actors for "Smart Cities with Iranian Identity": Establish "Cultural Smart City Working Groups" with City Councils, municipalities, universities, and NGOs to identify neighborhood cultural needs, design identity-preserving smart solutions (e.g., adhan/prayer apps, intelligent mosque lighting, local cooperation platforms), facilitate public oversight, and promote the "committed smart citizen."

Establish a "National Foundation for Cultural Studies of Algorithms": The Ministry of Science, Academy of Persian Language, and major universities should establish this foundation to: fund cultural-algorithm research; publish *Cultural Studies of Algorithms* journal; hold conferences; train PhD students in "Cultural Studies of Technology"; and provide cultural consultancy to policymakers and tech companies.

7.3. Research Limitations

Sample Limitation: The sample concentrated on youth aged 18-35 in Tehran. While this "leading sample" has methodological justification, it overlooks older groups, rural populations, ethnic minorities, and marginalized groups. Findings mainly represent "Iran's urban digital generation" experience.

Temporal Limitation: The algorithmic walkthrough covered three months (September-December 2025). Algorithms are dynamic, with frequent updates potentially producing different results. Findings represent a "cross-sectional picture" rather than a fixed one.

Algorithmic Black Box Limitation: The walkthrough with 60 test accounts faces three limitations: (a) Test accounts cannot replicate full human behavior complexity; (b) Accounts lack real social networks; (c) Algorithms are "black boxes" without access to codes/logic. Bias analysis relies solely on outputs (manifest behavior).

Interview Limitations: Interviews face: (a) "Self-reporting bias"—interviewees may not accurately report behaviors due to social desirability

or fear; (b) "Memory limitations"—many algorithmic responses are automatic/unconscious; (c) "Interview context effect"—formal settings may encourage socially desirable responses. The researcher mitigated these through comfortable atmosphere and confidentiality emphasis.

Theoretical and Conceptual Limitations: "Identity" is multi-layered and cannot be reduced to few indicators. Focusing on communicative/cultural dimensions overlooked psychological, biological, political, and historical aspects. AI-IoT convergence is emerging with no mature humanities theories; integrating theories across fields may involve conceptual inconsistencies.

Translation and Terminology Limitations: Concepts like "Algorithmic Governmentality" and "Surveillance Capitalism" carry "meaning change" risks in Persian translation. Precise equivalents and conceptual explanations mitigated this.

Researcher Bias Limitation: Theoretical inclination towards critical algorithm studies may have emphasized domineering aspects. Member checking, professor feedback, and clarifying presuppositions reduced this, though complete "indeterminacy" is unattainable in qualitative research.

Recommendations for Future Research: (1) Expand sample to include diverse age groups, rural populations, ethnic minorities; (2) Conduct longitudinal studies tracking algorithmic changes; (3) Develop methods accessing algorithmic code (e.g., regulatory transparency); (4) Employ mixed-methods combining quantitative big data with qualitative interpretations; (5) Conduct comparative studies between Iran and other non-Western societies facing similar challenges.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article. The research was conducted independently without any financial or personal relationships that could have influenced the findings, interpretations, or conclusions presented in this study.

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AI statement

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