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Presenting a Citizenship Model for Cultural and Social Development of Virtual Space Users among Tehran Citizens

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A B S T R A C T

Objective: The objective of this study is to present a citizenship model for cultural and social development of virtual space users among Tehran citizens.

Methods and Materials: The study employs a structural equation modeling (SEM) approach using the Partial Least Squares (PLS) method. A researcher-designed model was tested with data collected from 384 participants. The model evaluates the relationships between structural, behavioral, and contextual variables as well as their effects on citizen awareness and effective civic engagement. The Stone-Geisser Q^2 index and the goodness of fit (GOF) index were used to assess the model's predictive relevance and overall performance, respectively. Data were analyzed using Smart-PLS software, and significance was determined based on t-statistics with a confidence level of 95%.

Findings: Out of 15 tested hypotheses, 10 were confirmed. The results show that optimal structural, behavioral, and contextual conditions significantly impact the creation of platforms for enhancing citizen awareness in urban social development. However, the study found no significant mediating effect of internal and external factors between certain variables, such as the relationship between structural conditions and the improvement of citizen awareness. The model's GOF value of 0.368 indicates good overall model performance.

Conclusion: The findings suggest that structural, behavioral, and contextual conditions play a crucial role in fostering citizen awareness and engagement in virtual spaces. External factors, such as job opportunities and media influence, have a significant moderating effect on citizen engagement, while internal factors show no significant moderating role. Future research should explore further interactions between these variables.

Keywords: *Citizenship model, Cultural and social development, Virtual space*

1 Introduction

The urban population in Iran, following the global trend, is on the rise. Therefore, alongside urban development, the negative consequences of such growth must be mitigated. In this context, the use of virtual space capabilities (information and communication technology), such as e-government and e-commerce, plays a significant role in reducing these negative effects (Morad Hasel & Mazini, 2015). Citizenship education is one of the important concepts of urban life, transmitted to people through various organizations and tools. In the past, schools and curricula, along with cultural institutions like municipalities and national broadcasting, transferred social values and concepts. Today, social media, with its capabilities, produces and disseminates educational content, playing a crucial role in citizenship education (Faraji, 2018). Recent studies conducted internationally and published under the title of "citizenship studies" show that most societies are deeply concerned with how to prepare their children for life in contemporary communities and teach them how to participate in social, economic, cultural, and political issues. Furthermore, it has been noted that in various countries, a large portion of research and resources is devoted to discovering the characteristics of an ideal citizen and how to develop these traits across different societal groups (Fathi et al., 2009).

Research also indicates that citizenship rights in developed countries have gone through or are currently undergoing institutionalization, while citizenship education in developing countries is considered a new concept. In developing and underdeveloped nations, the incomplete integration of individuals and groups migrating from rural areas, the rapid population growth, the formation of two poles of poverty and wealth, and the coexistence of diverse social groups and classes lead to cultural and physical disintegration (Barkhordari & Jamshidian, 2008; Kafshchian Moghadam et al., 2024). As a social being, humans learn life skills, roles, and expected behaviors through the socialization process. In this study, virtual and internet-based media are emphasized, as they play a significant role in the field of citizenship culture education, contributing to the personal and social development of individuals and, ultimately, the societal development and progress of the community. To strengthen the spirit of citizenship, it is essential to first engage in cultural formation regarding the foundations and requirements of urban life through citizenship education. This education will inform individuals about their civil rights and responsibilities (Mirfardi, 2007; Shafiei, 2020; Tayefe Parchlo et al., 2023).

The present study aims to provide a citizenship model for the cultural and social development of virtual space users among Tehran citizens. In this framework, the study evaluates the impact of utilizing the capabilities of virtual space in realizing sustainable cultural and social development in Tehran, using local and urban advertisements in the virtual space targeted at social media users aged 18 and above residing in Tehran. By utilizing communication and information technology, media capabilities, and supporting virtual cultural industries and products to promote cultural and social development, and incorporating expert opinions in the field, a citizenship model for the cultural and social development of virtual space users in Tehran can be presented.

2 Methods and Materials

The research method is quantitative in nature. In this study, a tool was designed and applied to a statistical sample to validate the proposed model. The research is applied in terms of its objective. In applied research, the goal is to apply knowledge to new situations and develop practical knowledge in a specific field. In this research, the researcher, based on theories and approaches regarding citizenship in the cultural and social development of virtual space users among Tehran citizens, aims to apply these theories in an organizational and scientific context by designing and evaluating the proposed model. On the other hand, in terms of data collection, this is a field study and falls under the general category of non-experimental research methods.

Therefore, a quantitative method was used in this study to test the proposed citizenship model for the cultural and social development of virtual space users among Tehran citizens. The objective of this phase of the research is to identify complex relational patterns, examine the extent of relationships between categories, and achieve levels of generalizability in a larger sample. A descriptive-survey method and structural equation modeling were employed in this phase. The statistical population consists of social media users residing in District 2 of Tehran, and a sample of 384 users was selected through stratified random sampling (considering sectors such as insurance, healthcare, medical records, hospitals, and clinics).

To collect data, a researcher-made questionnaire was used. Content validity was applied to ensure the validity of the questionnaire. The preliminary form of the questionnaire

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was designed with ... items and was submitted to the research team for revision and completion. Based on repeated feedback, the initial questionnaire was reduced to ... items. The revised version was then presented to three additional experts, who were asked to provide corrective feedback on the relevance, coherence, and sufficiency of the items. After collecting their input, the necessary revisions were made in consultation with the research team, leading to further refinement of the wording and structure of the items, and the final questionnaire was reduced to ... items, which were confirmed by the experts.

Another technical feature of the instrument is reliability. To examine the reliability of the questionnaire, Cronbach's alpha coefficient was used. The final questionnaire was administered to 30 participants from the statistical population, and Cronbach's alpha was calculated using SPSS software. The computed Cronbach's alpha for the researcher-made questionnaire was ..., which confirms the reliability of the research instrument.

Finally, descriptive and inferential statistics were employed for data analysis. In the descriptive statistics section, mean and standard deviation were used, and in the inferential statistics section, confirmatory factor analysis was conducted using Smart PLS3 software, along with a one-sample t-test using SPSS19 software.

3 Findings and Results

After developing the structural model for the relationships between the research variables, the designed model was tested using the Smart-PLS virtual channels. The following section presents the criteria for testing the structural model in the first state, including the coefficient of determination (R^2) for endogenous latent variables, path coefficients (beta) and their significance, and the predictive relevance index (Q^2) or redundancy index.

In general, the main criterion for evaluating endogenous latent variables in the path model is the coefficient of determination. This index indicates what percentage of the variance in the endogenous variable is explained by exogenous variables. Values of 0.16, 0.25, and 0.47 for endogenous latent (dependent) variables in the structural (inner) path model are described as weak, moderate, and substantial, respectively. However, if the endogenous variable is influenced by a limited number (one or two) of exogenous variables, moderate coefficient values are also acceptable. Hair et al. (2011) describe values of 0.25, 0.50, and 0.75 for endogenous variables in the structural path model as weak, moderate, and substantial, respectively. It should be noted that the number of observable variables and the relationships established or entered into an endogenous latent variable influence the coefficient of determination for that variable. The coefficients of determination for the endogenous variables of the research are presented in Table 1.

Table 1

Coefficients of Determination for Endogenous Variables

Row	Endogenous Variable	Coefficient of Determination
1	Facilitators of civic engagement and maximum transparency of citizen awareness	0.451
2	The role of citizen awareness in urban social development	0.476
3	Effective civic engagement in citizen awareness	0.288
4	Qualitative improvement and increased transparency in citizen awareness	0.422

The results of Table 1 indicate that the coefficients of determination for the endogenous variables in the research model are at an acceptable level, which is appropriate given the small number of exogenous variables influencing the endogenous variables. Specifically, it can be stated that 42% of the changes in the endogenous variable (qualitative improvement and increased transparency in citizen awareness) are explained by the exogenous variables presented in the conceptual model of the research, which is an acceptable value. Additionally, approximately 29% of the changes in the endogenous variable (effective civic engagement in citizen awareness) and nearly 48% of the changes in the endogenous variable (the role of citizen awareness in urban social development) are explained by the exogenous variables in the conceptual model, which is also significant given the limited number of exogenous variables involved.

One of the indicators for confirming relationships in the structural model is the significance of path coefficients. The significance of the path coefficients complements the magnitude and direction of the beta coefficient in the model. If the obtained value exceeds the minimum statistic at the chosen confidence level (the t-statistic at 95% confidence is 1.96), the relationship or hypothesis is confirmed.

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Figure 1

Path Beta Coefficient Diagram for the Research Structural Model

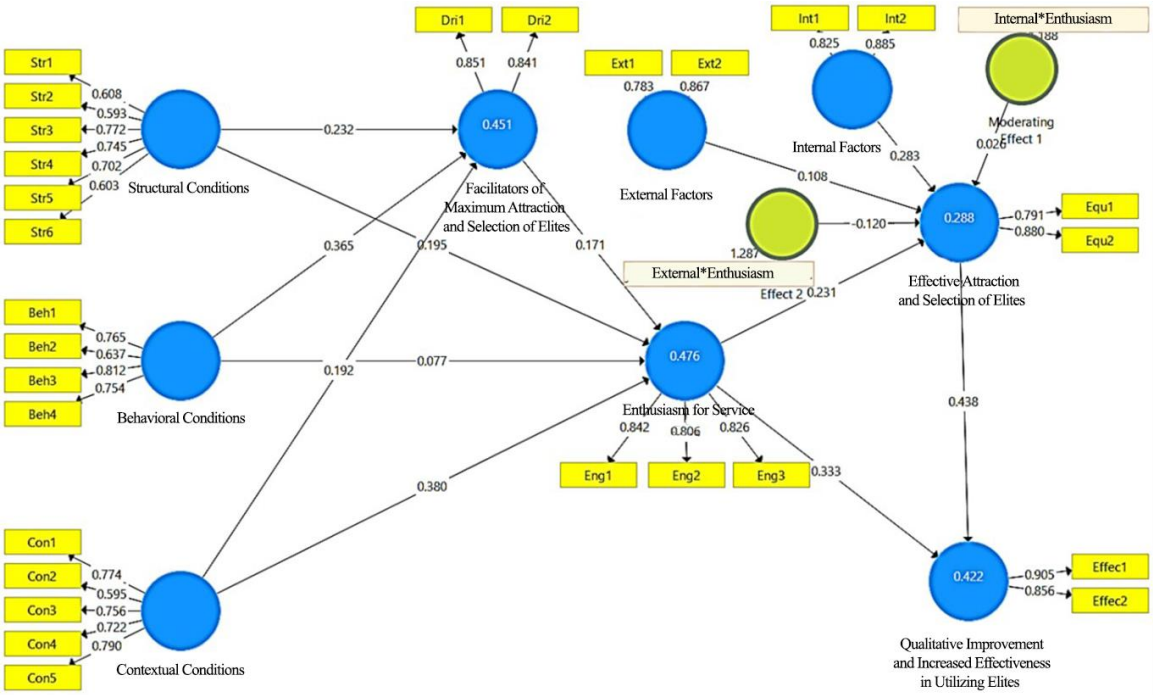
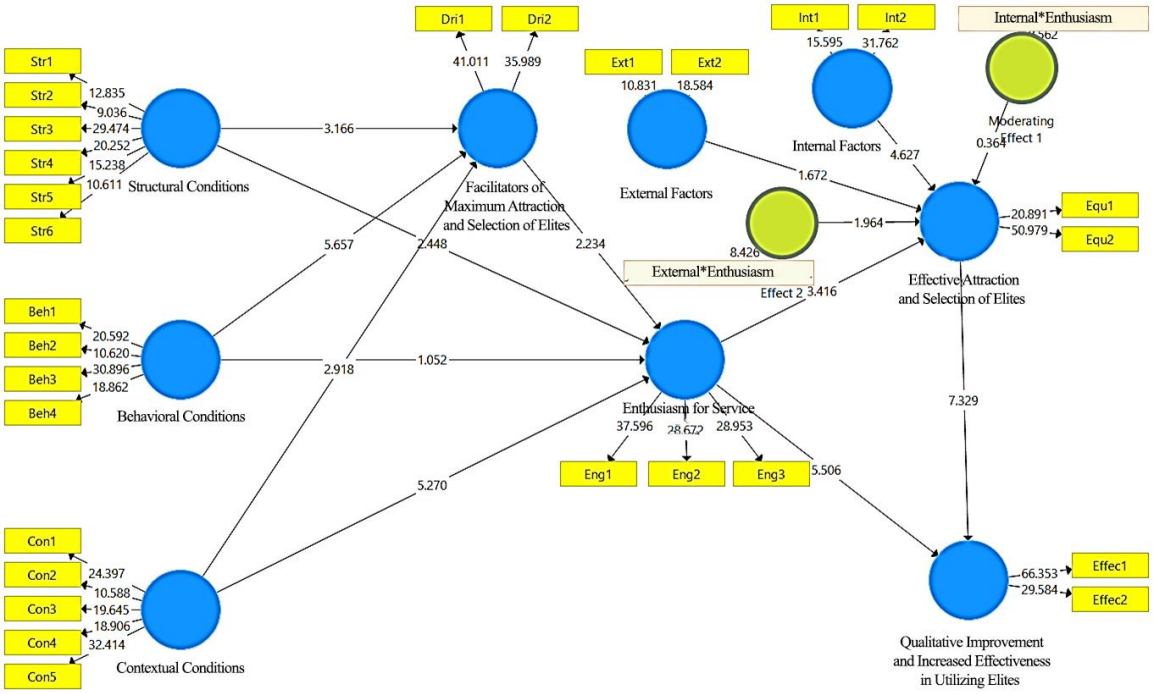


Figure 2

Significance Coefficient Diagram for the Research Structural Model (t-values)



In Figure 1, the graphical output of the path model in the Smart-PLS software is shown, where the path beta coefficients between each of the latent variables in the structural model are displayed. Additionally, Figure 2 shows

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the significance values for the structural model and measurement models, where all the obtained values exceed the t-statistic of 1.96 at a 95% confidence level, indicating that the path beta coefficients are significant, and the research hypotheses (except for hypotheses 5, 8, 9, 10, and 14) are confirmed.

Next, based on the path beta coefficients between endogenous and exogenous latent variables in the research structural model and the significance values obtained in the relationships between the variables, the research hypotheses are examined in the following:

Table 2

Beta Coefficients and Significance Values for the Research Hypotheses

Hypothesis Number	Hypotheses	Beta Coefficient	Significance Value	Hypothesis Outcome
1	Structural Conditions ---> Facilitators of civic engagement and maximum transparency of citizen awareness (direct effect)	0.232	3.166	Confirmed
2	Behavioral Conditions ---> Facilitators of civic engagement and maximum transparency of citizen awareness (direct effect)	0.365	5.657	Confirmed
3	Contextual Conditions ---> Facilitators of civic engagement and maximum transparency of citizen awareness (direct effect)	0.192	2.918	Confirmed
4	Structural Conditions ---> Improvement in the role of citizen awareness in urban social development (direct effect)	0.195	2.448	Confirmed
5	Behavioral Conditions ---> Improvement in the role of citizen awareness in urban social development (direct effect)	0.077	1.052	Rejected
6	Contextual Conditions ---> Improvement in the role of citizen awareness in urban social development (direct effect)	0.380	5.270	Confirmed
7	Facilitators of civic engagement and maximum transparency of citizen awareness ---> Improvement in the role of citizen awareness in urban social development (direct effect)	0.171	2.234	Confirmed
8	Structural Conditions ---> Facilitators of civic engagement and maximum transparency ---> Improvement in the role of citizen awareness in urban social development (indirect effect)	0.040	1.950	Rejected
9	Behavioral Conditions ---> Facilitators of civic engagement and maximum transparency ---> Improvement in the role of citizen awareness in urban social development (indirect effect)	0.062	1.851	Rejected
10	Contextual Conditions ---> Facilitators of civic engagement and maximum transparency ---> Improvement in the role of citizen awareness in urban social development (indirect effect)	0.033	1.869	Rejected
11	Improvement in the role of citizen awareness in urban social development ---> Effective civic engagement in citizen awareness (direct effect)	0.231	3.416	Confirmed
12	Improvement in the role of citizen awareness in urban social development ---> Qualitative improvement and increased transparency in citizen awareness (direct effect)	0.333	5.506	Confirmed
13	Effective civic engagement in citizen awareness ---> Qualitative improvement and increased transparency in citizen awareness (direct effect)	0.437	7.329	Confirmed
14	Improvement in the role of citizen awareness in urban social development ---> Effective civic engagement in citizen awareness (moderating effect of intra-virtual space factors)	0.026	0.364	Rejected
15	Improvement in the role of citizen awareness in urban social development ---> Effective civic engagement in citizen awareness (moderating effect of extra-virtual space factors)	-0.120	1.964	Confirmed

The findings related to the first hypothesis of the research, concerning the relationship between the variables "optimal structural conditions of the citizen awareness system in virtual space" and "facilitators of civic engagement and maximum transparency of citizen awareness," based on a beta coefficient of 0.232 in the relationship between the variables and a significance value of 3.166 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) have a significant impact on creating the facilitators for the citizen awareness position in urban social development.

Additionally, the findings related to the second hypothesis of the research, concerning the relationship between the variables "optimal behavioral conditions" and

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"facilitators of civic engagement and maximum transparency of citizen awareness," based on a beta coefficient of 0.365 in the relationship between the variables and a significance value of 5.657 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivation, patriotism, and adherence to religious and revolutionary values) have a significant impact on creating the facilitators for the citizen awareness position in urban social development.

Moreover, the findings related to the third hypothesis of the research, concerning the relationship between the variables "optimal contextual conditions of the citizen awareness system in virtual space" and "facilitators of civic engagement and maximum transparency of citizen awareness," based on a beta coefficient of 0.192 in the relationship between the variables and a significance value of 2.918 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) have a significant impact on creating the facilitators for the citizen awareness position in urban social development.

The findings related to the fourth hypothesis of the research, concerning the relationship between the variables "optimal structural conditions of the citizen awareness system in virtual space" and "improvement in the citizen awareness position in urban social development," based on a beta coefficient of 0.195 in the relationship between the variables and a significance value of 2.448 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) have a significant impact on improving the conditions of citizen awareness in virtual space.

Furthermore, the findings related to the fifth hypothesis of the research, concerning the relationship between the variables "optimal behavioral conditions" and "improvement in the citizen awareness position in urban social development," based on a direct beta coefficient of 0.077 in the relationship between the variables and a significance value of 1.052 (which is less than 1.96), indicate that the null hypothesis is confirmed, and the alternative hypothesis is rejected with 95% confidence. Therefore, it can be stated that, in general, the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivation, patriotism, and adherence to religious and revolutionary values) do not have a significant direct effect on improving the conditions of citizen awareness in virtual space.

Moreover, the findings related to the sixth hypothesis of the research, concerning the relationship between the variables "optimal contextual conditions of the citizen awareness system in virtual space" and "improvement in the citizen awareness position in urban social development," based on a beta coefficient of 0.380 in the relationship between the variables and a significance value of 5.270 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) have a significant impact on improving the conditions of citizen awareness in virtual space.

Furthermore, the findings related to the seventh hypothesis of the research, concerning the relationship between the variables "facilitators of civic engagement and maximum transparency of citizen awareness" and "improvement in the citizen awareness position in urban social development," based on a beta coefficient of 0.171 in the relationship between the variables and a significance value of 2.234 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the facilitators of the citizen awareness position in urban social development (including facilitators that are motivational and enabling) have a significant impact

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on improving the conditions of citizen awareness in virtual space.

The findings related to the eighth hypothesis of the research, concerning the relationship between the variables "optimal structural conditions of the citizen awareness system in virtual space," "facilitators of civic engagement and maximum transparency of citizen awareness," and "improvement in the citizen awareness position in urban social development," based on an indirect beta coefficient of 0.040 in the relationship between the variables and a significance value of 1.950 (which is less than 1.96), indicate that the null hypothesis is confirmed, and the alternative hypothesis is rejected with 95% confidence. Therefore, it can be stated that, in general, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) do not have a significant mediating effect on the relationship between the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) and the improvement of citizen awareness conditions in virtual space.

Similarly, the findings related to the ninth hypothesis of the research, concerning the relationship between the variables "optimal behavioral conditions," "facilitators of civic engagement and maximum transparency of citizen awareness," and "improvement in the citizen awareness position in urban social development," based on an indirect beta coefficient of 0.062 in the relationship between the variables and a significance value of 1.851 (which is less than 1.96), indicate that the null hypothesis is confirmed, and the alternative hypothesis is rejected with 95% confidence. Therefore, it can be stated that, in general, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) do not have a significant mediating effect on the relationship between the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivation, patriotism, and adherence to religious and revolutionary values) and the improvement of citizen awareness conditions in virtual space.

Moreover, the findings related to the tenth hypothesis of the research, concerning the relationship between the variables "optimal contextual conditions of the citizen awareness system in virtual space," "facilitators of civic engagement and maximum transparency of citizen awareness," and "improvement in the citizen awareness position in urban social development," based on an indirect beta coefficient of 0.033 in the relationship between the variables and a significance value of 1.869 (which is less than 1.96), indicate that the null hypothesis is confirmed, and the alternative hypothesis is rejected with 95% confidence. Therefore, it can be stated that, in general, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) do not have a significant mediating effect on the relationship between the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) and the improvement of citizen awareness conditions in virtual space.

Furthermore, the findings related to the eleventh hypothesis of the research, concerning the relationship between the variables "improvement in the citizen awareness position in urban social development" and "effective civic engagement in citizen awareness," based on a beta coefficient of 0.231 in the relationship between the variables and a significance value of 3.416 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the improvement in the citizen awareness position in urban social development has a significant impact on effective civic engagement in citizen awareness.

Moreover, the findings related to the twelfth hypothesis of the research, concerning the relationship between the variables "improvement in the citizen awareness position in urban social development" and "qualitative improvement and increased transparency in citizen awareness," based on a beta coefficient of 0.333 in the relationship between the variables and a significance value of 5.506 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, the improvement in the citizen awareness position in urban social development has a significant impact on qualitative improvement and increased transparency in citizen awareness.

Furthermore, the findings related to the thirteenth hypothesis of the research, concerning the relationship between the variables "effective civic engagement in citizen

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awareness" and "qualitative improvement and increased transparency in citizen awareness," based on a beta coefficient of 0.437 in the relationship between the variables and a significance value of 7.329 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, effective civic engagement in citizen awareness has a significant impact on qualitative improvement and increased transparency in citizen awareness.

Moreover, the findings related to the fourteenth hypothesis of the research, regarding the moderating effect of intra-virtual space factors (including restrictive regulations and budgetary limitations) on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness, based on a beta coefficient of 0.026 and a significance value of 0.364 (which is less than 1.96), indicate that the null hypothesis is confirmed, and the alternative hypothesis is rejected with 95% confidence. Therefore, it can be stated that, in general, intra-virtual space factors (including restrictive regulations and budgetary limitations) do not have a significant negative moderating effect on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness.

Finally, the findings related to the fifteenth hypothesis of the research, regarding the moderating effect of extra-virtual space factors (including stimulating job opportunities inside and outside the virtual space and negative propaganda in society, particularly by enemy media networks) on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness, based on a beta coefficient of -0.120 and a significance value of 1.964 (which is greater than 1.96), indicate that the null hypothesis is rejected, and the alternative hypothesis is confirmed with 95% confidence. Therefore, it can be stated that, in general, extra-virtual space factors (including stimulating job opportunities inside and outside the virtual space and negative propaganda in society, particularly by enemy media networks) have a significant negative moderating effect on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness.

In general, the quality of the structural model is calculated using the redundancy index (CV Red). This index assesses the ability of the structural model to predict based on the method of omission. The most well-known criterion for measuring this ability is the Stone-Geisser Q^2 index. According to this criterion, the model must predict the indicators of the reflective endogenous latent variables. Q^2 values greater than zero indicate that the observed values have been well reconstructed, and the model has the ability to predict the endogenous variable. Below are the calculated values for the redundancy index of the endogenous latent variables, and since these values are positive, it can be concluded that the structural model has the required quality for predicting the endogenous variables of the research.

Table 3

Redundancy Index for Endogenous Variables in the Structural Model

Row	Endogenous Variable	Redundancy Index
1	Facilitators of civic engagement and maximum transparency in citizen awareness	0.303
2	The role of citizen awareness in urban social development	0.306
3	Effective civic engagement in citizen awareness	0.171
4	Qualitative improvement and increased transparency in citizen awareness	0.311

In structural equation modeling using the PLS method, unlike covariance-based methods (with software like Amos or Lisrel), there is no single index to measure the overall model fit. However, Tenenhaus et al. (2005) proposed the goodness of fit (GOF) index. This index considers both the measurement and structural models and serves as a criterion for evaluating the overall performance of the model. The GOF index is manually calculated as the square root of the product of the average of the communalities and the average of the determination coefficient (R^2).

Since this value depends on the two aforementioned indices, its range is between zero and one. Tzeltz et al. (2009) introduced the values 0.01, 0.25, and 0.36 as weak, moderate, and strong for GOF, respectively. The calculated GOF for the research's structural equation model is 0.368, which indicates a good overall performance of the model.

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4 Discussion and Conclusion

According to the results of hypothesis validation, out of the 15 tested hypotheses, all except hypotheses 5, 8, 9, 10, and 14 were confirmed. Among these, the results for the first hypothesis showed that the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) have had a significant impact on creating the facilitators for the citizen awareness position in urban social development. Based on the second hypothesis, the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivations, patriotism, and adherence to religious and revolutionary values) had a significant impact on creating the facilitators for the citizen awareness position in urban social development. According to the third hypothesis, the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) have had a significant impact on creating the facilitators for the citizen awareness position in urban social development.

Based on the fourth hypothesis, the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) have had a significant impact on improving the conditions of citizen awareness in virtual space. According to the fifth hypothesis, the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivations, patriotism, and adherence to religious and revolutionary values) did not have a significant direct effect on improving the conditions of citizen awareness in virtual space. According to the sixth hypothesis, the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) had a significant impact on improving the conditions of citizen awareness in virtual space. According to the seventh hypothesis, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) had a significant impact on improving the conditions of citizen awareness in virtual space.

According to the eighth hypothesis, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) did not have a significant mediating effect on the relationship between the optimal structural conditions of the citizen awareness system in virtual space (including a flexible, elite-nurturing structure, job attractions, a popular virtual space brand, work-life balance, meritocracy in the organization, and an emphasis on creative thinking) and the improvement of citizen awareness conditions in virtual space. Based on the ninth hypothesis, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) did not have a significant mediating effect on the relationship between the optimal behavioral conditions of the citizen awareness system in virtual space (including the level of risk-taking, social responsibility, intrinsic motivations, patriotism, and adherence to religious and revolutionary values) and the improvement of citizen awareness conditions in virtual space. According to the tenth hypothesis, the facilitators of the citizen awareness position in urban social development (including motivational and enabling facilitators) did not have a significant mediating effect on the relationship between the optimal contextual conditions of the citizen awareness system in virtual space (including the social identity of the citizen awareness community, high social status, proper policymaking in citizen awareness matters, supportive financial and legal mechanisms for citizen awareness, and the educational environment and family institution) and the improvement of citizen awareness conditions in virtual space.

The findings for the eleventh hypothesis indicated that the improvement in the citizen awareness position in urban social development had a significant impact on effective civic engagement in citizen awareness. Meanwhile, the findings for the twelfth hypothesis showed that the improvement in the citizen awareness position in urban social development had a significant impact on the qualitative improvement and increased transparency in citizen awareness. According to the thirteenth hypothesis, effective civic engagement in citizen awareness had a significant impact on the qualitative improvement and increased transparency in citizen awareness. According to

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the fourteenth hypothesis, intra-virtual space factors (including restrictive regulations and budgetary limitations) did not have a significant moderating effect on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness. However, the findings for the fifteenth hypothesis indicated that extra-virtual space factors (including stimulating job opportunities inside and outside the virtual space and negative propaganda in society, especially by enemy media networks) had a significant moderating effect on the relationship between the improvement in the citizen awareness position in urban social development and effective civic engagement in citizen awareness.

Nonetheless, some hypotheses (hypotheses 5, 8, 9, 10, and 14) were not confirmed, and their findings are not consistent with previous research. For example, this inconsistency may be due to the type of structure, dominant virtual space culture, leadership and management style, hierarchical virtual space structure, and other factors in the studied community and other organizations examined in previous studies.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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