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Factors of the Use of AI Technology Influencing Community Security in UAE

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Abstract: This paper presents a study on addressing 27 factors of the use of AI technology influencing community security in UAE. The factors are categorised in five groups namely AI Ethics; Compatibility; Complexity; Management support; and Staff Capability. This study used a questionnaire survey with the Abu Dhabi Police department as a case study for community security. The survey managed to 138 valid responses and analysed descriptively. In deciding the level of influence. It was found that 16 of the factors are having very high influence while the others are having high influence. In ranking analysis, it was found that the highest rank of AI technology's factors influence community security in each group is for compatibility (COMPA5), which underscores the harmony between an individual's skills and the employed AI technologies; complexity (COMPLEX2), highlighting the efficiency of AI-driven systems, particularly in rapid knowledge acquisition through online conferencing; management support (MS4), spotlighting the proactive endorsement and direction from organizational management in AI security technology implementation; ethics of AI (ETH3), accentuating the individual's commitment to ethical considerations while employing AI security technologies; and staff capability (SC2), which reflects the individual's proficiency and competence in effectively harnessing AI technologies for enhanced community security measures. Collectively, these factors shed light on the multifaceted ways AI technologies impact and shape the realm of UAE community security.

Keywords: Use of AI Technology, community security

1. Introduction

This study examines the challenges associated with security intelligent systems in the United Arab Emirates (UAE). The role of artificial intelligence (AI) in security intelligent systems is of paramount importance, making it a central subject with implications for improving community security in the upcoming decades (Jia et al., 2019; Injadat et al., 2021). AI technology possesses versatile capabilities that can address various challenges across different application contexts, especially in enhancing community security (Klinger et al., 2018). Fundamental capabilities of AI technology involve incorporating research findings into processes to positively shape the future of security and interventions for community security (Klinger et al., 2018). AI holds potential in identifying and deterring security interventions that go beyond mere efficiency enhancement (Simon, 2019). However, implementing AI in security intervention settings necessitates addressing a range of challenges related to its deployment for community security (Klinger et al., 2018).

AI technology as compared with traditional human responses, lacks human-like judgment, intention, and contemplation. It pertains to machines that consistently respond to stimuli, and its significance is noteworthy in the realm

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of national security (Hurley, 2018). AI processes vast amounts of surveillance data and employs adaptive, intelligent, and intentional operations. Human analysts then examine patterns or suspicious activities identified by AI to enhance community security (Acemoglu & Restrepo, 2019).

The adoption of AI security technologies contributes to enhanced community security and the prevention of criminal activities (Haider et al., 2020). These software systems make decisions that typically require human expertise, aiding in problem anticipation and resolution (Zuiderveen Borgesius, 2018). The UAE government introduced the "UAE Strategy for Artificial Intelligence (AI)" in October 2017, marking a shift toward a post-mobile government future centered on diverse utilities, industries, and infrastructure projects (Ahmed et al., 2017). Aligned with the UAE Centennial 2071 goals, the strategy seeks to improve government performance and employ a digital communications system to swiftly address issues, positioning the UAE as a leader in AI investments across various sectors, including community security enhancement. In this context, the present study explore into the challenges associated with security intelligent systems, aiming to explore the factors that optimize the effective use of AI security technologies for improved community security.

2. Literature Review

The integration of AI technology into community security efforts, particularly in technologically progressive regions like the UAE, holds increasing significance. This convergence offers various benefits, including improved surveillance, predictive policing, emergency response optimization, and smart infrastructure management. Additionally, AI aids in behavioral analysis, threat detection, border security, disaster management, and public communication during emergencies. However, ethical concerns, data privacy, and regulatory frameworks must be carefully addressed to ensure the responsible and effective implementation of AI-driven community security measures. Balancing innovation with individual rights remains crucial in achieving the desired outcomes in the UAE's technologically advanced context (Horowitz, M.C, 2018; Allen, G.C., 2019; Babuta, A., et.al.2020)

2.1 Community Security

Community security encompasses a wide array of measures and strategies dedicated to ensuring the safety, protection, and overall well-being of individuals, families, and neighborhoods within a specific community. Its objective is to prevent and address various security threats, foster social harmony, and cultivate an environment where people can live, work, and interact without apprehension. Key components of community security include strategies such as crime prevention, establishing safety infrastructure, promoting social cohesion, raising awareness through education, preparing for emergencies, collaborating with authorities, integrating modern technologies like AI-driven surveillance, employing effective environmental design, engaging youth positively, respecting cultural diversity, and ultimately creating a sense of unity and well-being. By encouraging a safe atmosphere, community security encourages active participation in local activities, support for local businesses, and the overall enhancement of the community's development and vibrancy (Borzycki, M., 2005; Crawford and Evans, 2017; Sanders, and Langan, 2018).

2.2 AI Technology Factors Relevant to Community Security

This section explores several critical factors that influence the effectiveness of AI security technologies in enhancing community security. The first factor, Compatibility, emphasizes the alignment of technology with an organization's existing workflow, values, and cultural norms. When AI security technologies align with employee needs and skills, they positively impact community security effectiveness (Rogers, 2003; Jia et al., 2019; Injadat et al., 2021). The second factor, Complexity, refers to the level of difficulty in comprehending and applying an innovation. As AI is recognized as complex technology, this study examines how low complexity in AI security technologies fosters better community security outcomes (Rogers, 2003; Alsheibani et al., 2020; Tidd & Bessant, 2009).

Ethics of Artificial Intelligence is the third factor, highlighting the importance of addressing ethical concerns within an organizational context. Focusing on biases, integrity, and transparency, this factor emphasizes the role of ethics in utilizing AI to improve community security effectively (Sun et al., 2018; Mittelstadt, 2019; Sahlgren & Olsson, 2019; Acemoglu & Restrepo, 2019). Staff Capability, the fourth factor, underscores the significance of the workforce's abilities, education, and competence. Skilled staff, particularly those proficient in AI development, contribute to successful AI implementation and subsequently enhance community security (Scaccia et al., 2015; Alsheibani et al., 2020; Pumplun et al., 2019). Management Support, the fifth factor, entails the endorsement of organizational operations by authoritative figures. When top management actively supports AI security technologies, it plays a vital role in optimizing their use for community security improvement (Scaccia et al., 2015; Yang et al., 2015; Pumplun et al., 2019; Alsheibani et al., 2018). In summary, these factors collectively shape the effectiveness of AI security technologies for community security enhancement. The study postulates that when these factors are positively aligned, AI technologies become powerful tools for fostering safer communities.

2.3 Addressing AI Ethics, Compatibility, Complexity, Management Support and Staff Capability in AI Security Technology

The integration of artificial intelligence (AI) into security technology is transforming the landscape of threat detection and response. However, this advancement raises critical considerations in the domains of AI ethics, compatibility, complexity, management support, and staff capability. This discussion explores how these elements interact within the context of utilizing AI in security technology.

Ethical concerns are paramount when implementing AI in security technology. The responsible use of AI involves aligning technology deployment with moral and societal values. AI applications must not infringe upon human rights, promote discrimination, or violate privacy. Ensuring transparency in AI decision-making and addressing biases are vital steps toward ethical AI integration (Sun et al., 2018; Mittelstadt, 2019; Sahlgren & Olsson, 2019; Acemoglu & Restrepo, 2019).

AI's introduction into security technology requires compatibility with existing systems and organizational values. A lack of alignment can lead to conflicts between security goals and ethical principles. Compatibility extends beyond technical aspects to ethical frameworks, necessitating dialogue among stakeholders to ensure AI deployment respects established norms and values (Jia et al., 2019; Injadat et al., 2021.

The complexity of AI systems poses ethical challenges related to transparency and accountability. Complex AI algorithms, such as deep neural networks, can produce outcomes that are difficult to comprehend. Transparent and interpretable AI models are essential to overcome the "black box" problem, allowing for meaningful explanations of AI-driven decisions and maintaining ethical standards (Alsheibani et al., 2020; Tidd & Bessant, 2009.

Ethical considerations in AI integration depend on strong management support. Leadership plays a pivotal role in setting ethical standards, fostering a culture of responsible AI use, and making decisions that prioritize long-term ethical implications over short-term gains. Management's endorsement of ethical AI principles demonstrates an organization's commitment to aligning technology with values (Pumplun et al., 2019; Alsheibani et al., 2018).

An ethically sound use of AI in security technology hinges on the capabilities of the workforce. Staff must possess the knowledge and skills to comprehend AI's complexities, identify potential ethical dilemmas, and make informed decisions. Organizations should invest in training and development programs to empower staff in evaluating and managing AI systems responsibly (Scaccia et al., 2015; Alsheibani et al., 2020; Pumplun et al., 2019).

3. Data Collection

This research undertook a data collection approach that centred around conducting a questionnaire survey. To exemplify public organizations in the UAE, the Abu Dhabi Police department was chosen as a case study representative. The survey's primary objective was to gather perspectives from both managerial and operational staff within the organization. A total of 138 participants were included in the research design, and the questionnaire distribution was executed in a randomized manner using a variety of online tools and applications. Subsequently, the study successfully procured 138 valid responses from the initially targeted participant pool.

The core component of the questionnaire, in addition to gathering demographic information from respondents, consists of a compilation of 27 factors related to the utilization of AI technology that impact community security within the UAE. These factors have been categorized into five distinct groups, namely AI Ethics, Compatibility, Complexity, Management Support, and Staff Capability. Participants were tasked with assessing the influence of each of these factors on community security in the UAE using a 5-point Likert scale. The comprehensive list of factors is presented in Table 1.

Table 1 - List of on the use of AI technology influencing community security

Group	Factors	Description
Compatibility	COMPAT1	I have the skills to overcome the issues which I face when using artificial intelligence security technologies.
	COMPAT2	I have qualified myself to use artificial intelligence security technologies.
	COMPAT3	I can effectively use artificial intelligence security technologies.
	COMPA4	I can use the latest artificial intelligence security technologies.
	COMPA5	The artificial intelligence technologies in my organisation are compatible with my skills.
	COMPAT6	I have good knowledge about all the artificial intelligence technologies used in my organisation.
Complexity	COMPLEX1	Online conferencing system able to widen coverage/ dissemination information
	COMPLEX2	Online conferencing system able to provide fast new knowledge learning.
	COMPLEX3	Online conferencing system able for easy contribution to innovative creation.

	COMPLEX4	Online conferencing system able to face competitive education system conveniently.
	COMPLEX5	Online conferencing system able to make work communication easier.
Management Support	MS1	My management supports me to enhance my skills in using artificial intelligence security technologies.
	MS2	My management actively participates in improving the use of artificial intelligence security technologies.
	MS3	My management supports using the latest artificial intelligence security technologies.
	MS4	My management directs us to enhance the use of artificial intelligence security technologies.
	MS5	My organisation guides us to use up-to-date artificial intelligence technologies.
	MS6	My organisation supports us to use effective artifical intelligence technologies.
Ethics of Artificial Intelligence	ETH1	I keep ethical considerations when I use artificial intelligence security technologies.
	ETH2	I am aware of the privacy of people when using artificial intelligence security technologies.
	ETH3	I keep in mind integrity ethics when using artificial intelligence security technologies.
	ETH4	I always avoid any bias related to using artificial intelligence security technologies.
	ETH5	I am aware of the ethical side of using artificial intelligence technologies.
Staff Capability	SC1	I have good education regarding the use of artificial intelligence security technologies.
	SC2	I am qualified in terms of using artificial intelligence security technologies.
	SC3	I always polish my skills in using up-to-date artificial intelligence security technologies.
	SC4	I always update my knowledge in terms of using the latest artificial intelligence security technologies.
	SC5	I follow the latest trends of artificial intelligence security technologies.

4. Results and Analysis

4.1 Data Screening and Cleaning

This study ensured the meticulous verification and cleansing of acquired data post-coding, prior to its utilization in the primary analysis. This practice aligns with Pallant's (2011) recommendation to thoroughly examine and refine datasets before embarking on significant analyses, mitigating potential errors that could distort the study's integrity and introduce biased outcomes. The study identified potential data quality concerns encompassing reliability, normality distribution, and multicollinearity.

4.1.1 Reliability Assessment

Multiple item architectures need internal consistency to be dependable. According to Pallant (2011), the level of reliability is determined by how free of random error research measurements are, as well as how well a scale is able to produce consistent results when the same variable is measured repeatedly. The most widely employed measure of reliability is Cronbach's alpha. Cronbach's alpha evaluates the consistency of the measurement scale. (Hair et al., 2011; Wong, 2013) Internal consistency is defined as Cronbach's alpha better than 0.7. Alpha values ranging from 0.821 to 0.840, which indicate a satisfactory level of internal consistency for the survey, were found for the overall perception scale dependability of all dimensions. Table 2 below provides numbers for the Cronbach's Alpha reliability assessment.

Table 2 - Cronbach's Alpha reliability test

No.	Constructs	Code	Nos. of factors	Cronbach's Alpha
1	AI Ethics	ETH	5	0.840
2	Compatibility	COMPAT	6	0.821
3	Complexity	COMPLEX	5	0.836
5	Management support	MS	6	0.836
7	Staff Capability	SC	5	0.836

4.1.2 Normality Test

With organisational culture serving as the mediator between the IV and DV, the responses of the participants are used to examine the interaction between IT tools and the knowledge management process. The skewness and kurtosis values of all the items, as presented in Table 3, are used to test the normality of the data.

Table 3 - Normal distribution of the data

Group	Factors	Skewness Statistics	Kurtosis Statistics
Compatibility	COMPAT1	0.067	-0.677
	COMPAT2	0.653	-1.01
	COMPAT3	2.69	-1.415
	COMPA4	1.475	-1.208
	COMPA5	2.769	-1.572
	COMPAT6	2.481	-1.415
Complexity	COMPLEX1	0.554	-1.169
	COMPLEX2	2.056	-1.67
	COMPLEX3	0.702	-1.106
	COMPLEX4	-0.081	-0.729
	COMPLEX5	2.383	-1.256
Management Support	MS1	-0.244	-0.903
	MS2	0.246	-0.974
	MS3	1.676	-1.542
	MS4	1.314	-1.487
	MS5	1.759	-1.183
	MS6	0.335	-1.05
Ethics of Artificial Intelligence	ETH1	2.187	-1.528
	ETH2	1.27	-1.502
	ETH3	2.381	-1.808
	ETH4	1.199	-1.426
	ETH5	0.935	-1.333
Staff Capability	SC1	0.542	-1.125
	SC2	2.956	-1.626
	SC3	0.653	-1.01
	SC4	2.69	-1.415
	SC5	1.475	-1.208

According to George and Mallery (2021), the skewness and kurtosis value scores for measuring items should be between -3 and +3, which are the values that are needed to ensure that the data is normal and it is ready for analysis. As shown in Table 3, the results of all items are within the acceptable range of -3 to +3, indicating that the data has normal distribution, and it is ready for further analysis.

4.2 Level of Influence of Factors

The gathered data concerning the impact of Artificial Intelligence technologies on community security in the UAE underwent descriptive analysis. Among the outcomes is the mean score assigned to each factor, a value that aids in gauging the degree of influence that factor holds over community security, in accordance with response evaluation criteria. These criteria, as outlined in Table 4, are drawn from the work of Çelik and Oral (2016).

Table 4 - Response evaluation criteria (Çelik and Oral, 2016)

Likert Scale	Description of the scale	Mean Interval	Meaning
1	Strongly disagree	**1.00-1.80**	Very low influence
2	Disagree	**1.81-2.60**	Low influence
3	Neither	**2.61-3.40**	Moderate influence
4	Agree	**3.41-4.20**	High influence
5	Strongly agree	**4.21-5.00**	Very high influence

Table 5 presents the AI Influential Factors affecting community security in the UAE. These factors are assessed using their mean scores and are contrasted with the evaluation of responses from Table 4 to determine their respective levels of influence.

Table 5 - Results of factor's level of influence

Group	AI Influential Factors to community security	Mean Score	Level of influence based on mean score
Compatibility	COMPAT1	4.094	High influence
	COMPAT2	3.826	High influence
	COMPAT3	4.203	Very high influence
	COMPA4	4.188	High influence
	COMPA5	4.442	Very high influence
	COMPAT6	4.384	Very high influence
Complexity	COMPLEX1	4.348	Very high influence
	COMPLEX2	4.399	Very high influence
	COMPLEX3	3.978	High influence
	COMPLEX4	4.065	High influence
	COMPLEX5	4.203	Very high influence
Management Support	MS1	4.203	Very high influence
	MS2	4.116	High influence
	MS3	4.360	Very high influence
	MS4	4.370	Very high influence
	MS5	4.297	Very high influence
	MS6	4.181	High influence
Ethics of Artificial Intelligence	ETH1	4.159	High influence
	ETH2	4.261	Very high influence
	ETH3	4.514	Very high influence
	ETH4	4.246	Very high influence
	ETH5	4.261	Very high influence
Staff Capability	SC1	4.152	High influence
	SC2	4.268	Very high influence
	SC3	3.826	High influence
	SC4	4.203	Very high influence
	SC5	4.188	High influence

Table 5 categorizes AI influential factors in community security based on their mean scores and response evaluation criteria of table 4 which prescribe levels of influence, ranging from very low to very high influence. Hence, table 5 provides a summary of AI influential factors in community security, along with their mean scores and the corresponding levels of influence:

- Compatibility: Among the compatibility factors, COMPAT3 has a very high influence with a mean score of 4.203. COMPA5 and COMPAT6 also have very high influence with mean scores of 4.442 and 4.384 respectively. Other compatibility factors (COMPAT1, COMPAT2, COMPA4) have high influence levels with mean scores ranging from 4.094 to 4.188.
- Complexity: Both COMPLEX1 and COMPLEX2 have very high influence, with mean scores of 4.348 and 4.399 respectively. COMPLEX5 follows with a very high influence and a mean score of 4.203. COMPLEX3 and COMPLEX4 have high influence levels, with mean scores of 3.978 and 4.065 respectively.
- Management Support: Among the management support factors, MS3 and MS4 have very high influence, with mean scores of 4.360 and 4.370 respectively. MS5 also has a very high influence with a mean score of 4.297. Other management support factors (MS1, MS2, MS6) hold high influence levels with mean scores ranging from 4.116 to 4.203.
- Ethics of Artificial Intelligence: ETH3 stands out with very high influence, having the highest mean score of 4.514. Both ETH2 and ETH5 also have very high influence, with mean scores of 4.261. ETH4 holds a very high influence with a mean score of 4.246, while ETH1 has high influence with a mean score of 4.159.
- Staff Capability: SC2 has very high influence, being the most influential among staff capability factors, with a mean score of 4.268. SC4 follows with a very high influence and a mean score of 4.203. SC1 and SC5 have high influence levels, with mean scores of 4.152 and 4.188 respectively. SC3 holds a high influence with a mean score of 3.826.

4.3 Ranking of Factors

This section shows the ranking analysis of influential AI factors in community security, utilizing the mean score as the determining factor. In instances of tied mean scores, the standard deviation will serve as the differentiating criterion, favouring factors with smaller standard deviations for higher rankings within the same group. As illustrated in Table 6, the ranking of the five group of influential AI factors to community security which are compatibility, complexity, management support, ethics of AI technologies, and staff capability—encompasses their impact on community security.

Table 6 - Ranking of influential AI factors in community security

Group	AI Influential Factors to community security	Mean Score	Std. Deviation	Rank within the group
Compatibility	COMPAT1	4.094	0.807	**5**
	COMPAT2	3.826	1.116	**6**
	COMPAT3	4.203	0.800	**3**
	COMPA4	4.188	0.929	**4**
	COMPA5	4.442	0.742	**1**
	COMPAT6	4.384	0.735	**2**
Complexity	COMPLEX1	4.348	0.848	**2**
	COMPLEX2	4.399	0.997	**1**
	COMPLEX3	3.978	1.011	**5**
	COMPLEX4	4.065	0.87	**4**
	COMPLEX5	4.203	0.853	**3**
Management Support	MS1	4.203	0.934	**4**
	MS2	4.116	0.917	**6**
	MS3	4.360	0.893	**2**
	MS4	4.370	0.917	**1**
	MS5	4.297	0.746	**3**
	MS6	4.181	0.919	**5**
Ethics of Artificial Intelligence	ETH1	4.159	0.957	**5**
	ETH2	4.261	1.072	**3**
	ETH3	4.514	0.744	**1**
	ETH4	4.246	1.048	**4**
	ETH5	4.261	0.943	**2**
Staff Capability	SC1	4.152	0.932	**4**
	SC2	4.268	0.905	**1**
	SC3	3.826	1.116	**5**
	SC4	4.203	0.800	**3**
	SC5	4.188	0.929	**2**

Table 6 presents the mean scores, standard deviations, and ranks of various factors influencing community security related to artificial intelligence (AI): Compatibility: Among the compatibility factors (COMPAT1 to COMPAT6), COMPA5 has the highest mean score (4.442), making it the most influential compatibility factor. COMPA6 follows with a mean score of 4.384, placing it second. Other compatibility factors like COMPAT3, COMPA4, COMPAT1, and COMPAT2 hold mean scores between 4.203 and 3.826. Complexity: Among the complexity factors (COMPLEX1 to COMPLEX5), COMPLEX2 is the most influential with the highest mean score (4.399). COMPLEX1 ranks second with a mean score of 4.348. The remaining complexity factors (COMPLEX3, COMPLEX4, and COMPLEX5) have mean scores ranging from 4.203 to 3.978.

Management Support: Among the management support factors (MS1 to MS6), MS4 stands out as the most influential with a mean score of 4.370. MS3 follows with a mean score of 4.360, placing it second. Other management support factors have mean scores between 4.297 and 4.116. Ethics of Artificial Intelligence: ETH3 holds the highest mean score (4.514) among the ethics-related factors, making it the most influential. ETH5 ranks second with a mean score of 4.261. The remaining ethics factors (ETH2, ETH4, ETH1) have mean scores ranging from 4.261 to 4.159. Staff Capability: Among the staff capability factors (SC1 to SC5), SC2 is the most influential with a mean score of 4.268. SC5 follows closely with a mean score of 4.203, placing it second. Other staff capability factors hold mean scores between 4.188 and 3.826.

Based on the earlier finding, table 7 tabulated the most AI influential factors to UAE community security in each of the five groups.

Table 7 - List of the most influential factor

Group	The most AI influential factors to community security	Description of factor
Compatibility	COMPA5	The artificial intelligence technologies in my organisation are compatible with my skills
Complexity	COMPLEX2	Online conferencing system able to provide fast new knowledge learning
Management Support	MS4	My management directs us to enhance the use of artificial intelligence security technologies.
Ethics of Artificial Intelligence	ETH3	I keep in mind integrity ethics when using artificial intelligence security technologies.
Staff Capability	SC2	I am qualified in terms of using artificial intelligence security technologies.

Table 7 summarizes different factors related to the influence of artificial intelligence (AI) technologies in a community security organization: Compatibility (COMPA5): This factor focuses on the compatibility between the AI technologies used in a community security organization and the skills possessed by the individual. It implies that the individual feels that their skills are aligned with the AI technologies employed by their organization. Complexity (COMPLEX2): This factor pertains to the complexity of the AI technologies or systems, particularly in the context of online conferencing. It suggests that the online conferencing system being used is effective in facilitating rapid learning of new knowledge.

Management Support (MS4): This factor highlights the support provided by the management of the organization in terms of enhancing the utilization of AI security technologies. The management is actively involved in directing and encouraging the use of these technologies. Ethics of Artificial Intelligence (ETH3): This factor revolves around ethical considerations when using AI security technologies. The individual emphasizes the importance of maintaining integrity and ethical standards while utilizing these technologies. Staff Capability (SC2): This factor reflects the individual's proficiency in utilizing AI security technologies. The person feels adequately qualified and competent in using these technologies effectively.

5. Conclusion

This paper presents a study on addressing 27 factors of the use of AI technology influencing community security in UAE. The factors are categorised in five groups namely AI Ethics; Compatibility; Complexity; Management support; and Staff Capability. This study used a questionnaire survey with the Abu Dhabi Police department as a case study for community security. The survey managed to 138 valid responses and analysed descriptively. In deciding the level of influence. It was found that 16 of the factors are having very high influence while the others are having high influence. In ranking analysis, it was found that the highest rank of AI technology's factors influence community security in each group is for compatibility (COMPA5), which underscores the harmony between an individual's skills and the employed AI technologies; complexity (COMPLEX2), highlighting the efficiency of AI-driven systems, particularly in rapid knowledge acquisition through online conferencing; management support (MS4), spotlighting the proactive endorsement and direction from organizational management in AI security technology implementation; ethics of AI (ETH3), accentuating the individual's commitment to ethical considerations while employing AI security technologies; and staff capability (SC2), which reflects the individual's proficiency and competence in effectively harnessing AI technologies for enhanced community security measures. Collectively, these factors shed light on the multifaceted ways AI technologies impact and shape the realm of UAE community security.

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