

Conceptual Framework of Service Quality Performance with Willingness to Use AI Technology on Safeguarding Properties in UAE.

Salem Ahmed¹, Ng Kim Soon ²

¹ Researcher, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia, Batu Pahat, MALAYSIA

² Lecturer, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia, Batu Pahat, MALAYSIA

ABSTRACT

Artificial Intelligence (AI) is a processing system in a machine like computer/robot which can act like human being having automation of intelligent behavior. This AI technology is widely used in many industry sectors including security sector. UAE is increasingly concerned about security and also aware the level of security service received from its public organisations. Despite the importance of measuring service quality, only few empirical research has been conducted in the delivery of service quality of AI technology on safeguarding the properties in UAE. This paper presents a literature review which uncovered factors for the service quality of AI technology on safeguarding properties. With these factors, a conceptual structural model was proposed that linked these service quality factors toward the usage of the AI technology security system. This model can further used to assess the relationship strength amongst the factors once the survey data is available. This model is expected to aid the authority about identified factors of the service quality of AI security technology.

Keywords

AI, Service quality, Quality performance, Security technologies, UAE

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

Artificial intelligence is one of the computer science branches which make machine like computer to behave like humans having automation of intelligent behavior. Artificial intelligence is used in developing games, expert systems, natural language, and robotics. Artificial Intelligence (AI) technology change human life with the invention of the first computer in the early 1940s [1]. Modern Artificial Intelligence started at the first conference on AI convened at Dartmouth College in New Hampshire in 1956. At this conference scientists discussed the possibility of computers that could behave intelligently [2, 3]. In the early 1980s, Fuzzy Logic techniques were implemented on Japanese subway trains and also in the production of Danish cement manufacturing system. The Expert System was started to be used in mid 1980s by large company [5]. By end of 1980s, Neural Networks was used in business applications [4]. Then AI applications keep progressing in the early 1990s in application such as automatic scheduling software, software to manage information for individuals, automatic mortgage underwriting systems and automatic investment decision makers. In the mid1990s, AI technology has improved and used in software to predict daily revenues and staffing requirements for a business, credit fraud detection systems and

decision support systems. It was then in late 1990s, AI was used in applications such as data mining tools, e-mail filters and web crawlers [7]. In this globalization era, service quality is considered a main factor for an organization success. Industry experts acknowledged the important of service quality as an effective competitive approach in shaping the marketing and business strategy. This trending approach is being adopted through the setting up of customer relation department in most of the organizations. The role of this department is specifically to listen and entertain the customer needs which indirectly measure the level of service quality. Most of the organisations have the intentions of providing quality service to their customers/clients/stakeholders. For service industry, it promote 'best service wins' to stay competitive with others. Salespersons realized that competition is well managed through service quality. Hence, service quality is important in achieving competitive advantage for an organization. Deprived quality service will make the organization not competitive in this challenging era. With good service quality it helps a company to stay competitive if it offer almost identical services such as security services. Then by establishing good quality service it will differentiate oneself to others and can yield a

higher proportion of consumer's choices which resulted having better financial achievement [8].

A security is an important issue for human, company environment, organization, community and country to maintain growth and stability. Security threat gives rise to several problems such as instability, economical setbacks, terror attacks causes loss of human lives, creates Un-safety feelings [2]. Security is a challenging task to human because of limitations and restrictions like analyzing and processing several information at a time. This is big drawback can be overcome by more practical manner with the help of artificial intelligence techniques integration. Examples of security system includes home affair security, intrusion detection system, DOS attack, cryptography, video vigilance system and others. Human processing ability integrated with AI will certainly increase the security at high level [4]. The integration of Artificial Intelligence will certainly improve the performance of the existing security system. Thus, the security system will alert the user before unwanted things happened. Security has becoming major issue around the world including in UAE. The government is focussing adopting AI in security technology to ensure the safety of the business and the people. Customers are seeking AI technology providers that can serve their satisfaction.

With globalization and liberalization, it accelerates merger and acquisition of industry especially service sectors which included AI security industry. This cause intense competition among AI security companies in offering products and services. Due to this, the focus areas for organizations are changing from profit maximization to maximizing profits through increased customer satisfaction [9]. With the digitalization of information, customers nowadays are well informed and this creates challenges to service provider in offering the services [10]. AI security service industry is among the pillars in contributing to the economy for UAE, this industry need to offer better services to the customer. [11].

This paper proposes a conceptual model of artificial intelligence service quality industry in United Arab Emirate. This is because the UAE people are aware and concerned about service quality level they received from organizations especially on security services. Not many empirical research has been conducted in the

delivery of service quality of AI technology in UAE.

Service Quality

Quality can be understood and interpreted in different manner depends on individual perspective. Consumers and producers may have different perceptions about quality. From the consumers' point of view, quality product or service is the product or service that meets suit their needs. While from the producer/manufacturer, quality indicates the product or service that has been sold successfully. Whereas from the market segment, quality is the goods or services that meet the needs of a particular customer [12]. Usually customer's perception on quality depends on the quality of products or services; organisation/company image; the employees services; prices of the products or services and others [13]. The impact on the customer perception is important as it creates value to the product/service/organization. Uniqueness of the product or service which affects the customer perception contributes to the better quality of service or product [14]. Basically, quality is free but low quality of service or product is costly because it needs to perform additional activities to improve it [15, 16]. The quality of services or products depends on customers experience with the product or service. The quality of the services or product highly depend to the customer expectations either imposed or gesture. [17,18]. Based on the literature, the factors affecting service quality performance as uncovered by previous researchers are listed in table 1.

Table 1. Service quality performance factors

No	Factors affecting service quality performance	References
1	Performance expectancy	[13]; [14]; [15]; [16]; [17]; [18]; [19]; [20]; [21];
2	Effort expectancy	
3	Social influence	
4	Facilities conditions	

Table 1 indicates the factors contributing to service quality performance where these factors are parts of the quality assurance system of an organization. Every organization or company embrace quality assurance system so that the

services or products offered can be accepted by customers. It is important for the organization to support the quality assurance system where recommendation from the system can be used for future improvement.

Artificial Intelligence Security

Artificial Intelligence (AI) is a nonhuman intelligence that able to replicate human mental skills, such as pattern recognition, understanding natural language, adaptive learning from experience, strategizing, or reasoning [22, 23,24]. It can also mean a machine which can incorporate abstraction and interpretation into information processing and make decisions at a level of sophistication of that human intelligent. Computer system also applied AI where it able to perform tasks that normally require human intelligence for eaxmple perception, conversation, decision-making [27]. However, while human intelligence has been the common choice as a yardstick for benchmarking or assessing progress in AI development, there are also approaches that do not seek to recreate human intelligence or performance, but instead focus more on systems that approach an ideal-typical ‘rational’ performance [25, 26].

A security is an important issue for human, company environment, organization, community and country to maintain growth and stability. Security threat gives rise to several problems such as instability, economical setbacks, terror attacks causes loss of human lives, creates Un-safety feelings [27]. Security is a challenging task to human because of limitations and restrictions like analyzing and processing several information at a time. This is big drawback can be overcome by more practical manner with the help of artificial intelligence techniques integration. Examples of security system includes home affair security, intrusion detection system, DOS attack, cryptography, video vigilance system and others. Human processing ability integrated with AI will certainly increase the security at high level [28]. The integration of Artificial Intelligence will certainly improve the performance of the existing security system. Thus, the security system will alert the user before unwanted things happened. Security has becoming major issue around the world including in UAE. The government is focussing adopting AI in security technology to ensure the safety of the business and the people.

Customers are seeking AI technology providers that can serve their satisfaction. Literature has uncovered several factors that encourage the willingness to adopt AI security technology as in table 2.

Table 2. Factors that satisfy the usage of AI security technology

No	Factors on usage of AI technology	References
1	Satisfaction with technology	[22]; [23]; [24]; [25]; [26]; [27]; [28]
2	Perceived impact of technology	
3	Interest in future technology	
4	Job performance	

Factors from table 1 and 2 are used to formulate the conceptual framework that is presented in the following heading.

Conceptual Framework

A conceptual framework is the apparent flow of relationship among the studied variables representing a diagrammatic form. The conceptual framework is a deduction made from the research theoretical framework which is generated from reviewed literature on the subject matter under investigation. It provides a clear explanation on the linkages or relationship that shows the hypothesis postulated for readers understanding without being bordered to read through the whole document. It is also a summary of how the variables of the study are connected to each other. For this study, the conceptual framework is about the relationship between services quality with the willingness to use AI security technology in safeguarding the properties. The formulation of this framework is based on the attributes of services quality in table 1 and the attributes of willingness to use AI security technology in table 2. Thus the framework is as figure 1

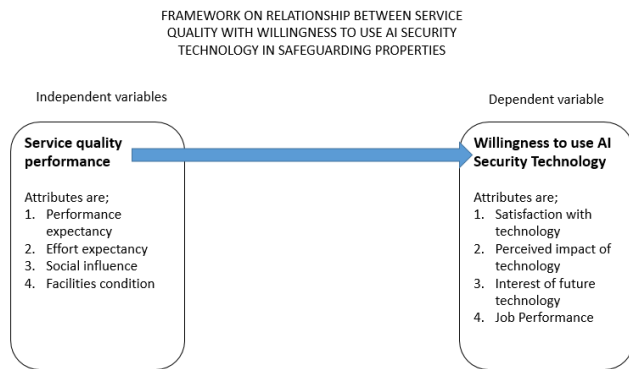


Figure1. Conceptual Framework

As shown on Fig.1, the independent variables of service quality performance which has four construct that are performance expectancy, effort expectancy, social influence and facilities condition. The dependent variable on the other end is the willingness to use AI security technology which consisted of factors such as satisfaction with technology, perceived impact of technology, interest in future technology and job performance.

Conclusion

This paper presented a conceptual framework generated from the theoretical knowledge of literature review on the subjects of service quality performance and the application of AI security technology for properties. The framework depicted noteworthy groups of components, specifically service quality Performance and AI security technology needs in UAE. This framework can defined the scope to pursue further research by getting questionnaire data to generate a structural model based on this framework which can assess the strength of the relationships. The significance of this study is a definite scope which will help elicit all the problems and effect of different security challenges among general public in UAE. Also, it will assist in highlighting how security agents and general public react under stereotyped condition posed by insecurity. The research will help to challenge both the security agents and general public in UAE on both the importance attached to AI security technologies for the sustainable growth, safety and development of UAE.

Acknowledgement

The authors would like to thank the Universiti Tun Hussein Onn Malaysia for supporting this research work.

References

- [1] Mackey, A., & Gass, S. M. (2015). Second language research: Methodology and design. Routledge.
- [2] McCarthy, J. (1990). Formalizing common sense: papers (Vol. 5). Intellect Books.
- [3] Young, K. S. (1998). Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior*, 1, 237-244.
- [4] Hussain, R., Al Nasser, A., & Hussain, Y. K. (2015). Service quality and customer satisfaction of a UAE-based airline: An empirical investigation. *Journal of Air Transport Management*, 42, 167-175.
- [5] Lupo, T. (2015). Fuzzy ServPerf model combined with ELECTRE III to comparatively evaluate service quality of international airports in Sicily. *Journal of Air Transport Management*, 42, 249-259.
- [6] Mc Carthy, S. M., Vayanos, P., & Tambe, M. (2017). Dynamic decisions and adaptive allocations: Robust planning for physical and cyber threat screening games. In *IWAISe: First International Workshop on Artificial Intelligence in Security* (p. 8).
- [7] Michalski, R. S., Carbonell, J. G., & Mitchell, T. M. (Eds.). (2013). *Machine learning: An artificial intelligence approach*. Springer Science & Business Media.
- [8] Meng, Q., Zhang, L., & He, L. (2014, June). Classification of service quality elements based on Fuzzy Kano model: An empirical study in Chinese machinery industry. In *Service Systems and Service Management (ICSSSM), 2014 11th International Conference on* (pp. 1-5). IEEE.
- [9] Milne, D., & Witten, I. H. (2013). An open-source toolkit for mining Wikipedia. *Artificial Intelligence*, 194, 222-239.

- [10] Musib, M., Wang, F., Tarselli, M. A., Yoho, R., Yu, K. H., Andrés, R. M., & Dutton-Regester, K. (2017). Artificial intelligence in research. *Science*, 357(6346), 28-30.
- [11] Mok, C., Sparks, B., & Kadampully, J. (2013). *Service quality management in hospitality, tourism, and leisure*. Routledge.
- [12] Orel, F. D., & Kara, A. (2014). Supermarket self-checkout service quality, customer satisfaction, and loyalty: Empirical evidence from an emerging market. *Journal of Retailing and Consumer Services*, 21(2), 118-129.
- [13] Pakdil, F., Kurtulmuşoğlu, F. B., & Yolu, E. (2014). Improving service quality in highway passenger transportation: a case study using quality function deployment. *EJTIR*, 14(4), 375-393.
- [14] Pannu, A. (2015). Artificial intelligence and its application in different areas. *Artificial Intelligence*, 4(10).
- [15] Pirani, S. I., & Arafat, H. A. (2016). Interplay of food security, agriculture and tourism within GCC countries. *Global Food Security*, 9, 1-9.
- [16] Rich, C., & Waters, R. C. (Eds.). (2014). *Readings in artificial intelligence and software engineering*. Morgan Kaufmann.
- [17] Russell, S., Dewey, D., & Tegmark, M. (2015). Research priorities for robust and beneficial artificial intelligence. *Ai Magazine*, 36(4), 105-114.
- [18] Salih, A., Ma, X., & Peytchev, E. (2017). Implementation of Hybrid Artificial Intelligence Technique to Detect Covert Channels Attack in New Generation Internet Protocol IPv6. In *Leadership, Innovation and Entrepreneurship as Driving Forces of the Global Economy* (pp. 173-190). Springer International Publishing.
- [19] Srivastava, S., Bisht, A., & Narayan, N. (2017, January). Safety and security in smart cities using artificial intelligence—A review. In *Cloud Computing, Data Science & Engineering-Confluence*, 2017 7th International Conference on (pp. 130-133). IEEE.
- [20] Teeroovengadum, V., Kamalanabhan, T. J., & Seebaluck, A. K. (2016). Measuring service quality in higher education: Development of a hierarchical model (HESQUAL). *Quality Assurance in Education*, 24(2), 244-258.
- [21] Vanathi, B., Shanmugam, K., & Uthairaj, V. R. (2016). A Secure M-Commerce Architecture for Service Provider to Improve Quantity and Quality of the Products Using Fingerprint Authentication and Gender Classification. *Asian Journal of Information Technology*, 15(2), 232-242.
- [22] Varakantham, P., An, B., Low, B., & Zhang, J. (2017). Artificial Intelligence Research in Singapore: Assisting the Development of a Smart Nation. *AI Magazine*, 38(3), 102-105.
- [23] Vilhena, J., Vicente, H., Martins, M. R., Grañeda, J., Caldeira, F., Gusmão, R., & Neves, J. (2017). An Artificial Intelligence Approach to Thrombophilia Risk. *International Journal of Reliable and Quality E-Healthcare (IJRQEH)*, 6(2), 49-69.
- [24] Wenger, E. (2014). *Artificial intelligence and tutoring systems: computational and cognitive approaches to the communication of knowledge*. Morgan Kaufmann.
- [25] Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, 2(2), 140-156.
- [26] Legg, S. and Hutter, M. (2007). Universal Intelligence: A Definition of Machine Intelligence. *Minds and Machines*, 17(4):391-444, Springer.
- [27] Sanders, J., Munford, R., Liebenberg, L., & Ungar, M. (2014). Consistent service quality: The connection between service quality, risk, resilience and outcomes for vulnerable youth clients of multiple

services. *Child Abuse and Neglect*, 38(4), 687-97.

- [28] Milne A., Palmer A., Brigden C. & Konta E. (2013) The intersection of work and care: evidence from a local case study, *European Journal of Social Work* 16 (5), 651-670