Ensuring the Security of an Internet-based E-learning System through the Use of Integrated Encryption Methods

Sanobar Shadmanova[1*], Nodir Karimov[2], Mukaddaskhon Taylanova[3],
Mamurakhon Asrorkhujaeva[4], Umida Mavlyanova[5], Shukriya Nazirova[6], Yulia Isaeva[7],
and Zulfiya Pardaeva[8]

[1*]Tashkent State University of Oriental Studies, Uzbekistan.
shadmanova.sanobar@gmail.com, https://orcid.org/0009-0009-6274-2636

[2]Tashkent State University of Oriental Studies, Uzbekistan.
nodir-karimov@list.ru, https://orcid.org/0000-0001-5127-8713

[3]Tashkent State University of Oriental Studies, Uzbekistan.
muqaddas_93@mail.ru, https://orcid.org/0009-0004-6766-188X

[4]Tashkent State University of Oriental Studies, Uzbekistan.
mamurakhonasrorkhujaeva@gmail.com, https://orcid.org/0009-0000-8136-1489

[5]Tashkent State University of Oriental Studies, Uzbekistan.
mavlyanovaumida@mail.ru, https://orcid.org/0000-0002-5941-1336

[6]Tashkent State University of Oriental Studies, Uzbekistan.
doston088@mail.ru, https://orcid.org/0000-0002-8145-9918

[7]Jizzakh State Pedagogical University, Uzbekistan.
yuliya_4265@mail.ru, https://orcid.org/0000-0001-6597-6221

[8]Jizzakh State Pedagogical University, Uzbekistan.
zulfiyapardaeva@jspi.uz, https://orcid.org/0000-0002-7554-5908

Abstract

Most schools have used information technology (IT) to enhance and advance their various educational methodologies to attract more learners. Institutions have implemented IT to facilitate E-learning and mobile learning, enhancing the cost and versatility of educational offerings. Most educational institutions are providing online instruction using technology such as cloud computing (CC) and networking. Educational institutions have established their own E-Learning Systems (ELS) to facilitate online learning, enabling remote education. However, ELS must confront several security concerns related to hacks and data breaches via unauthorized entry. Also, a novel idea of Internet-based ELS architecture has emerged to enhance service proximity to the customer. This research presents a novel CC and Internet-based ELS system. This study proposed the implementation of Integrated Encryption Methods (IEM), which incorporates two encryption algorithms, Rivest-Shamir-Adleman (RSA) and Advanced Encryption Standard (AES), to meet the safety and latency requirements for communication among the CC and the ELS. The suggested

*Corresponding author: Tashkent State University of Oriental Studies, Uzbekistan.