

## **Abstract**

Digital transformation is considered as a fundamental stage toward electronic governance worldwide. The government sectors in Saudi Arabia seek to digitalize all their services. Therefore, providing electronic services has become one of the institutions' requirements to achieve the optimum levels determined by the digital maturity index in the kingdom.

Educational institutions have invested in this trend to develop many of their electronic services. Even though, educational certificates are still issued on paper in most of educational institutes. Paper certificates may increase validation obstacles. In addition to the possibility of fraud.

Blockchain technology is a promising revolution that used in a lot of fields. This technology offers several advantages that make it applicable in regard of electronic educational certificates. These advantages include decentralization, transparency and stability.

The aim of this thesis is to conduct an analytical study system for issuing digital certificates based on the blockchain technology. A model for an educational institution's certification were chosen. Then, the necessary changes of the ecosystem parts were made to be complied with certificate sample. Thereafter, the transaction was issued in the Bitcoin testnet that is available for developers for testing purposes.

The experiment of the system performance showed a noticeable efficiency in maintaining the integrity of the certificate contents. The issues related to the security and privacy of the system were discussed. As well as the suggestions for further development in this area.