

Embed RFID chip as a security add value to large Egyptian banknote denomination

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Abstract:

In our time Modern technology plays an effective role as one of the currency security elements against counterfeit, Making it an added value in combating counterfeiting and securing currency against fraud Thus preserving the global and national economy and preventing many crimes that result from currency counterfeiting, Japan's Hitachi has developed a micro-chips that identify radio frequency (RFID) 60 microns and operate at 2.45 GHz, which does not require any external antenna, Allowing the inclusion of tracking and identification chips within banknotes, tickets and other paper products. [1]

The micro-chips RFID has been added to the Euro, Japanese Yen, US Dollar and Australian Dollar Currencies to increase their security alongside with the currency common security components.

Hence, the problem of the research is that the Egyptian banknotes does not guarantee the technology of micro-chips RFID IC tags to increase its security properties, especially larger denomination banknotes such as the hundred and two hundred Egyptian pounds, which is the first target of the forgers, which is always trying to falsify and print.

The research used an analytical, descriptive approach based on the description and analysis of the RF-IC tags and the experiences of countries in integrating this technology into their banknotes in order to achieve the desired results.

The research aims to shed light on the importance of the use of microchips RFID IC tags as a value added to Egyptian paper currency to raise the banknote security level in accordance with the currency denomination. In order to achieve the objective of the research, the research plan included the following axes:

The first axis: Definition of RFID technology and its types

The second axis: Micro-RFID chip from Japanese Hitachi

Axis 3: Banknotes containing the micro - RFID chip

Axis IV: A proposed model for the 200-pound banknote to integrate the micro RFID chip as an added value to its current security elements.

The research has yielded the following results: The embed of micro-chip RFID into banknotes will increase the security levels of the banknote, the difficulty of fraud and the speed of discovery of the fraud. also Microchip RFID technology will make it easier to read and verify the banknotes through the banks' And ATMs.

The micro-chip RFID technology will increase the cost of banknotes production and should therefore be placed in the large banknote denominations as one hundred and two hundred pounds, and this act will reduce the losses caused by counterfeiting of banknote and helping law enforcement agencies to track smart banknotes as part of their efforts to combat drug trafficking or Other organized crime programs.

The study recommends that the Central Bank of Egypt adopts RFID micro-chip tags as one of the additional techniques to secure Egyptian banknotes with large denominations such as one hundred and two hundred pounds, as well as awareness of the potential of RFID technology μ -chip integrated in the banknotes and how to deal with them to achieve the highest levels of security of the banknotes

Key words:

RFID, Privacy, Banknote Protection, μ -chips RFID, banknotes, currency, Europe, European central bank, money, money laundering, RFID chipped banknotes

Introduction:

Modern technology plays an effective role as one of the elements of securing banknotes against counterfeiting, which makes it an added value in combating counterfeiting and securing banknotes against fraud, thus preserving the global and national economy and preventing many of the crimes that result from currency fraud, which have devastating effects on the world. And specifically Egypt, which must keep abreast of global developments in the use of modern technologies in the field of paper currency insurance.

Therefore, research and development centers are always working to innovate technologies that protect the human and economy against the risks of crimes resulting from counterfeit banknotes to limit the attempts of counterfeiters and reveal their methods used in counterfeiting banknotes, which depend mainly on the user not knowing means of the elements of banknotes security, also penetrate the gaps and fraud in the devices Currency exchange.

Japan's Hitachi has developed a micro-chips that identify radio frequency (RFID) 60 microns and operate at 2.45 GHz, which does not require any external antenna, Allowing the inclusion of tracking and identification chips within banknotes, tickets and other paper products. [1]

At present, Hitachi chips and many chips from other companies are competing with antennas to receive data for external devices to read 128-bit information stored in ROM. In the case of current generation Hitachi chips, this antenna can range from 5 cm to 7 cm.

Although the chips themselves are very small with an area of 0.4 mm x 0.4 mm, the large antenna used with the chip effectively limits their use in certain applications. The new microchips are the same size as the current model 0.4 mm square but do not require any antenna, allowing the chips to use the power of the incoming electric waves to transfer the ID wirelessly to the reader of the chips and thus the chip can work 0.4 mm \times 0.4 mm completely on the automatic itself, making it suitable for a wider range of uses, including inclusion in banknotes and bank documents. [2]

The micro-chips RFID has been added to the Euro, Japanese Yen, US Dollar and Australian Dollar banknotes to increase their insurance alongside to the currency security elements.

Research problem:

The problem of the research is that the Egyptian banknotes does not embed the technology of micro-chips RFID IC tags to increase its security properties, especially larger denomination banknotes such as the hundred and two hundred Egyptian pounds which is the first target of the forgers.

Research Methodology:

The research used an analytical, descriptive approach based on the description and analysis of the RF-IC tags and the experiences of countries in integrating this technology into their banknotes in order to achieve the desired results.

Research limits:

Banknote denomination of 200 Egyptian pounds

Research aims:

The research aims to shed light on the importance of the use of microchips RFID IC tags as a value added to Egyptian paper currency to raise the banknote security level in accordance with the currency denomination. In order to achieve the objective of the research, the research plan included the following axes:

The first axis: Definition of RFID technology and its types

The second axis: Micro-RFID chip from Japanese Hitachi

Axis 3: Banknotes containing the micro - RFID chip

Axis IV: A proposed model for the 200-pound banknote to integrate the micro RFID chip as an added value to its current security elements.

Results:

- The produce of Egyptian banknotes secured with RFID technology μ -chip will increase thesecurity levels of banknotes and the difficulty of fraud and the speed of fraud discovery .
- The produce of Egyptian banknotes embedded RFID micro-chip technology, will facilitate reading and verifying the information of the banknotes through the various bank's reading devices for banknotes and ATMs.
- Micro-chip RFID technology will add value to the Egyptian banknote's security elements alongside with the rest of the security elements.
- Micro-chip RFID technology will increase the cost of banknotes productions, therefore should be placed in the large banknotes denominations as one hundred and two hundred pounds while at the same time will reduce the losses caused by counterfeiting paper currency.
- Micro-chip RFID technology also enables law enforcement agencies to track smart banknotes as part of their efforts to combat drug trafficking or other organized crime programs.

Recommendations:

- The study recommends that the Central Bank of Egypt adopt the RFID technology μ -chip tags as one of the additional technologies to secure Egyptian banknotes with large denominations such as one hundred and two hundred pounds
- Research recommends the need to raise awareness of the potential of RFID micro-chip technology in banknotes and how to deal with it in order to achieve the highest levels of banknotes security.

Past experiences:

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