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A Radio Frequency Identification (RFID) based solution to Certificate Counterfeiting.

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Abstract

The Degree Certificate awarded by a University is an asset of prime importance in an individual's life, circulation of fake degree certificates is a menace to the society, and a threat to the ***integrity*** of both the certificate holder and the educational institution the certificate purports to be from. Hence, there is a pressing need for universities to adopt a process that can ensure ***security*** of information and ***authenticity*** of the ***certificate*** issued.

SmartCERT is expected to be the solution to this menace

Background

- Counterfeiting and piracy are a range of **illicit** activities linked to intellectual property rights (IPR) infringement.
- International trade in counterfeit and pirated products could have been up to USD 200 billion in 2005 (OECD, 2007).

- These illicit activities steal market share from legitimate businesses and undermine innovation, with **negative implications** on **economic growth**.
- Bribery associated with counterfeiting and piracy weakens the effectiveness of public institutions at the expense of society at large.

Introduction

•Universities across the world face ever increasing challenges in discharging their role as providers and enablers of higher education. One of the serious challenges faced by them is the circulation of ***fake*** or ***duplicate*** degree certificates.

•Besides, factors such as very high student strength and overworked staff, physical issuance and verification of certificates is cumbersome, time consuming and at times unreliable.

Problem Definition

- While the examination bodies have managed to stage a reasonably successful relentless fight against exam cheating, the war has moved from the confines of the examination rooms to the certificate production arena.
- Fake certificates that could easily pass for genuine ones are conveniently produced in the backstreets of major towns in Kenya.
- The certificates soon get into circulation thereby generating unfair competition for job posting and vacancies
- The practice is widely believed to be going on, thanks to technology and its sophistication. However, this situation cannot, and must not be left to continue.

Problem Justification

- SmartCert, a Radio Frequency Identification (**RFID**) based solution, enables universities to curb the problem of fake degree certificates and forgery of mark sheets.
- Using SmartCert, a university can award certificates with an embedded **RFID tag** that is **encoded** with the **holder's name**, **date of graduation**, type of **degree** and entire **transcript**, **photograph** and **biometrics** (fingerprints), all **digitally signed** by the university authorities.
- SmartCert also enables potential employers, foreign embassies, other universities and other stakeholders to read the data embedded in the RFID tag and verify the identity of the certificate holder and authenticity of the certificate.

Objectives

- To develop a web based distributed referencing system that would provide a solution to the problem of certificate counterfeiting in both the work places and institutions of higher learning by providing means of linking certificates from multiple certifying authorities with features useful in combating identity theft and invasion of privacy.
- To design a second generation certificate that would hold a user information in an RFID tag that would ensure authenticity of the certificate issued and help in reducing cases of certificate counterfeiting and forgery.

>That would provide an avenue for future employers and interviewing panels to verify the authenticity of certificates of the interviewees.
>And minimize expenditure on conducting due diligence on employees/interviewees and prospective students.

How the SmartCert will curb Certificate Counterfeiting

- The system is designed to defeat the crime of certificate counterfeiting by rendering the counterfeited certificates useless.
- This will be possible through the establishment of *SmartCert* as the **de facto** referencing tool in the **validation** process for both the students' credentials and certificates' authenticity. Given the inbuilt referencing and tracking ability of the system, it is set to be a foolproof system in the students' validation process.

About RFID

- Radio Frequency Identification (RFID) uses radio frequency waves to transfer data between a reader and a moveable item which is tagged, to identify, categorize and track the item. It is fast, reliable, and does not require contact between reader/scanner and the tagged item.
- RFID provides a wireless, over-the-air interface. Unlike bar codes, line-of-sight communication is not necessary. RFID uses an integrated microchip and antenna that reads information

RFID System

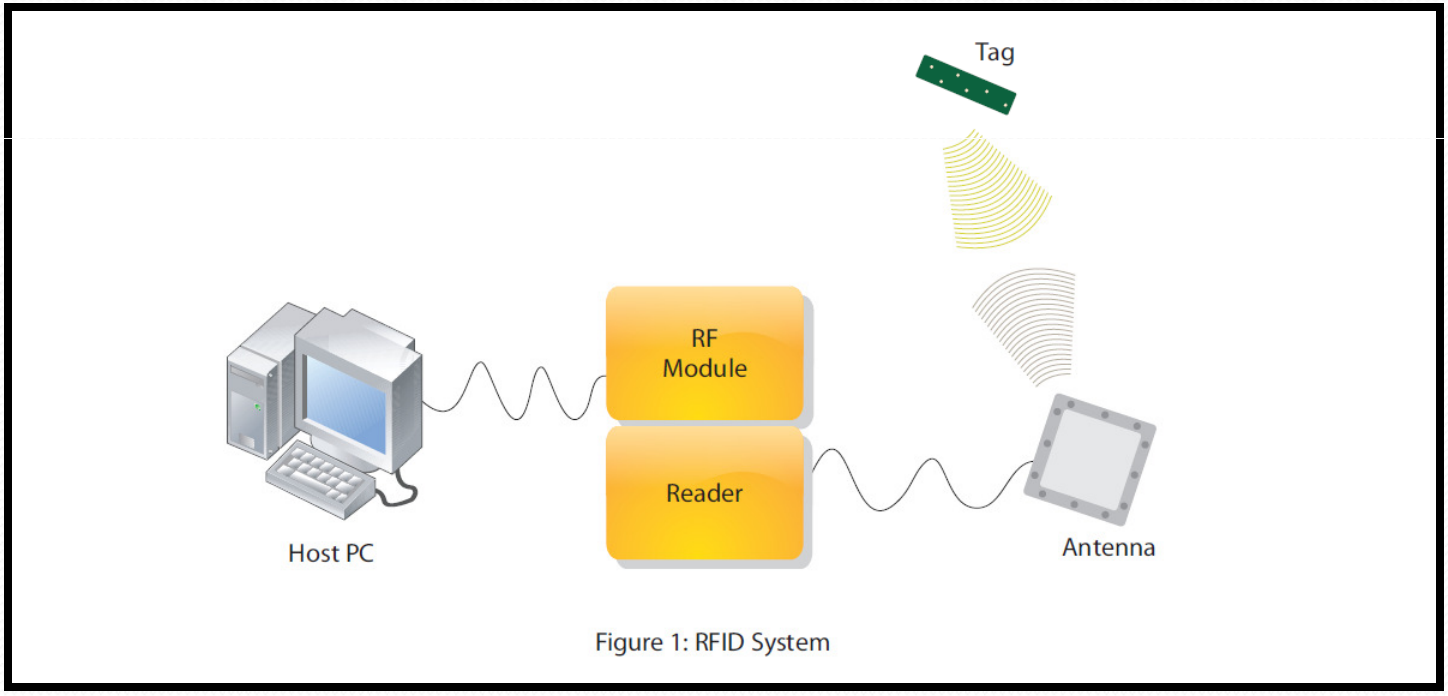

Figure 1: RFID System

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- SmartCERT enables universities and other educational institutions to award degree certificates with an embedded passive 13.56 MHz RFID tag, complying with the ISO 14443A standard.
- Each tag is encoded with the certificate holder's **name**, **date** of **graduation**, type of **degree** and entire **transcript**, **photograph** and the **biometrics** (fingerprints), all digitally signed by the university authorities. The RFID-tagged certificate is an **authentic representation** of the student's educational qualification and credibility, certified by the university.

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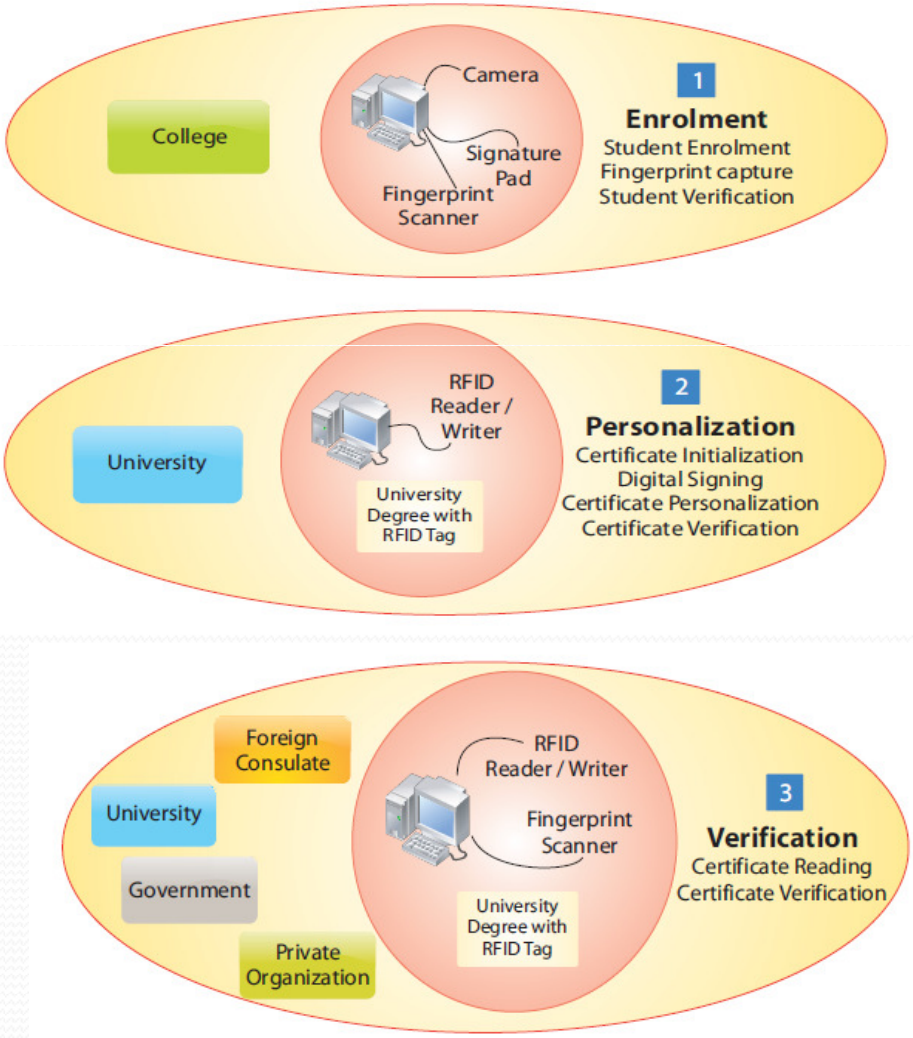
- The entire system can be summarized in 3 simple steps, Enrolment, Personalization and Verification:



Beneficiaries

- The key beneficiaries will be learning institutions in:
  >Admission of students into learning institutions
  >Recruitment of new staff,
  >Renewing contracts of existing staff,
  >Development of staff training programs,
  >Establishment and maintenance of students' internship programs, fighting white collar crime, evaluation of school curriculum's effectiveness, and for strategic planning for both private and government agencies.

Conclusion and Recommendation

- There is no question regarding the gravity of certificate counterfeiting and its impact on the dynamics of job placements ,the recruitment process and economic growth.
- This situation calls for a foolproof solution that takes away focus from the problem and places it on the solution.

- The solution itself has got to be **sustainable**, **reliable**, readily **available** and **efficient**. In this regard, **SmartCert** has all the qualities to meet the requirements of that solution.
- I therefore recommends that **SmartCert** be adopted as the best solution to the problem of certificate counterfeiting and a means to boost our **economy.**

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Thank You!

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