DIALOGUE SYSTEMS AS A MEANS OF DETECTING COUNTERFEITED PHARMACEUTICALS/DRUGS BY CONSUMERS

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ABSTRACT

The menace of counterfeiting pharmaceuticals/drugs has become a major threat to consumers, healthcare providers, drug manufacturers and governments. It is a source of public health concern both in the developed and developing nations. Several solutions for detecting and authenticating counterfeit drugs have been adopted by different nations of the world. In this article, a dialogue-based solution is proposed. This solution is premised on the continuous increase in the usage of telephones, especially mobile phones in all parts of the world. The approach will provide a cost-effective, ubiquitous, anywhere and anytime means of authenticating the genuineness of pharmaceuticals in addition to complimenting the existing systems.

Keywords: *Counterfeiting, drugs, pharmaceuticals, dialogue system, NAFDAC and voice application*

1. INTRODUCTION

What constitutes a counterfeit drug differs from one nation to the other [1]. However, according to the World Health Organization (WHO), 'A counterfeit medicine is one which is deliberately and fraudulently mislabeled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and counterfeit products may include products with the correct ingredients or with the wrong ingredients, without active ingredients, with insufficient active ingredients or with fake packaging' [2]. According to the Nigerian Counterfeit and Fake Drugs and Unwholesome Processed Foods (Miscellaneous Provisions), a fake drug is [3]:

i. Any drug product which is purported to be; or
ii. Any drug or drug product which is so coloured, coated, powdered or polished that the damage is concealed or which is made to appear to be better or of greater therapeutic value than it really is, which is not labeled in the prescribed manner or which label or container or anything accompanying the drug bears any statement, design, or device which makes a false claim for the drug or which is false or misleading; or
iii. Any drug or drug product whose container is so made, formed or filled as to be misleading; or
iv. Any drug product whose label does not bear adequate directions for use and such adequate warning against use in those pathological conditions or by children where its use may be dangerous to health or against unsafe dosage or methods or duration of use; or
v. Any drug product which is not registered by the Agency in accordance with the provisions of the Food, Drugs and Related Products (Registration, etc) Decree 1993, as amended.

This monster, if not checked using a combination of methods, portends a grave danger to the entire world population. Consumers, healthcare providers, drug manufacturers and governments all have one risk or the other if the menace is not tackled with all armories.

However, there have been several detection and authentication methods used in curtailing and mitigating the effects of counterfeit drugs. This paper presents a dialogue-based method to augment the existing ones. The proposed method has the advantage of being usable by the non-literates in Africa where the level of literacy is very low ([4], [5]). It is also suitable for the visually impaired and can be implemented in the various indigenous languages of Africa. In addition, it will provide eyes-free interaction, and serve as a great aid for the physically challenged. This approach exploits the ubiquitous and widespread availability of mobile phones to reach a vast majority of the world population, Nigerians inclusive.

2. TECHNOLOGIES DEVELOPED AGAINST COUNTERFEITING

Several technologies have been developed to detect and control counterfeit drugs. Among them are the following [6]:

Sanofi-Aventis Security Label (SASL): Developed exclusively for sanofi-aventis by one of the world's leading manufacturers of security paper (bank notes). This security label is a tamper-proof security label, measuring 25x15 mm, attached to the packaging of high-risk products.

Traceability Technology Based on Bar Codes (Datamatrix): The objective for setting up this code is to ensure traceability of each box in its supply chain to the pharmacist until the end-user, the patient.

Other methods are [1]:

Simple Chemical Approaches: These are simple and low-cost approaches to rapidly identify counterfeit drugs in developing countries. The techniques applied here are thin layer chromatography (TLC) and colorimetry. TLC allows the active ingredient to be recognized by comparison with a known drug standard. This approach is cheap, specific and sensitive. Similarly, colorimetry is rapid and highly specific [7].

Bulk Property Testing: Bulk properties of matter include weight, density, solubility, viscosity, refractive index and optical rotation, as well as physical description of the tablets. These can be easily measured by low cost, rugged equipment and can provide simple tests for detecting counterfeit drugs [8].