

## Detection of Alteration in Suspected Documents– A Case Study

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**ABSTRACT:** In this paper an attempt has been made to describe the characteristics involved in examination of alteration in numbers. In that aspect visible light and hand lens, software and some regular but substantial and authentic techniques were used to drag the truth from the piece of paper. In this paper alteration in numbers were detected by instruments and software by their characteristics such as size, space, slant, characters and pen-pressure. The documents were also analysed for their authenticity. Each case studies shown different characteristics which was detected on the basis of case requirement.

**Keywords:** alteration, characteristics, documents, pen pressure

### Introduction

Document refers to something that contains information [1]. That information can be held on wax, tapes or stored electronically. In another words documents are those which are not only made of paper but also other materials which can bear written messages. For example, boards, walls or even bodies can all bear written messages. Altering, forging or creating any type of document with the intention to defraud is considered as a forgery. Adapting, imitating or making objects, documents or statistics with intention of cheat for changing the perception of anyone and to earn money by selling the forged items are considered as forgery [2]. When forgery affects any type of the rights of a person whether it is public or private and against the law, it is a crime. Various types of instruments used in forgery are also covered by law and considered as illegal. Forgery requires duplicity.

Bhavanaand Kalyan (2013) studied the characteristics of handwriting and signature such as initial and final strokes, slant, alignment, t-crossing, i-dots, spacing *etc.* and tried to analyse handwriting or signatures [3]. Forgery is not a crime and could not be charged unless it does not have the deception and larceny. Some common types of forgeries are simulation, cut and paste, tracing, electronic forgery and freehand. Bhavanaand Kalyan (2013) worked on characteristics of handwriting for comparison of handwriting and signature [3]. The crime of forgery involves every class of instruments known to the law which affect private and public rights.

Different types of documents and instruments commonly forged include money orders, securities, documents used in identity theft, cheques, promissory notes, bills of exchange, deeds, titles, bonds, court seals, currency and corporate documents.

Amongst, cheques, rubber stamp and fake ID's are the commonly used documents for forgery as they are use in large amount for legal and financial work. From time to time, new techniques and patterns are developed and introduced by document experts to examine and identify the forged document. Nonetheless, it is always a challenge to catch the forgers with their regenerated innovation for counterfeit the documents.

### Materials and Methods

#### Collection of samples

Two suspected samples for alteration in document were collected for this study. The samples were preserved by scanning to the hard disk for their re-use in this work. An official stamp was placed in every questioned sample clearly mentioning the case number, date and page number. The next step comprises of the marking of the document. The marking of a questioned sample was encircled with red pencil and marked in "Q" series'. Every questioned document was photographed before and after every process to prove their evidential value later or whenever needed. Examinations of the suspected document were done by detecting alteration in suspected documents.

**Preliminary examination**

Preliminary examination was conducted on the document for the originality and authenticity. The background details of the document were recorded and the document were examined back and forth precisely under good source of light. The contents of the document were examined and the observation was recorded. Information recorded included background details, impression, odor and any marks.

**Instrumental analysis**

The collected samples were examined by various types of instruments, including ruler, hand lens, microscope and ultraviolet-visible light chamber for magnifying, processing images and analyzing the outcome.

**Results and Discussion**

In this study, two cases were presented. These cases were examined and inspected thoroughly by different types of instruments. Several types of parameters were used like tremors, speed, pen pressure, ink colour and shading. Microscopic examination was also performed. Each case was analysed very carefully and evaluated methodically. Micro-details of every case were examined, photographed then collected for this work.

In this case, alteration in year was in question. First of all, the questioned receipts were examined from back and forth carefully and closely using magnifier and microscope under good source of light. Images of Q1 and Q2 (Figures 1 and 2) were then processed digitally where the pictures were uploaded into computer.

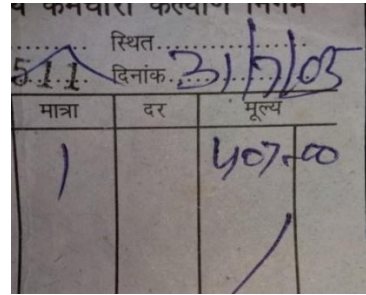


Figure 2: Questioned Sample (Q2)

Through image software, the photograph of the backsides of Q1 and Q2 were flipped left to right for easier reading. Differences were noticed and appeared clearer. Upon careful examination, alteration in year was found at the backside of questioned samples (Q1 and Q2) as shown in Figure 3. Colour filter was also applied for better view of questioned samples (Q1 and Q2). Microscopic examination showed that two shades of blue ink were present as demonstrated in Figure 4. Pen pressure was lighter than the overall written content. On the basis of above examinations, the questioned sample Q1 was altered from 2016 to 2018, and sample Q2 was altered from 2003 to 2005, respectively.

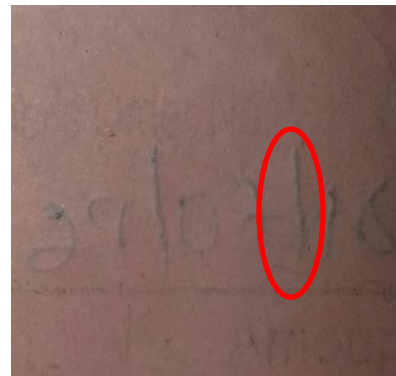


Figure 3: Flipped and Filtered Colour Image of Questioned Sample from backside

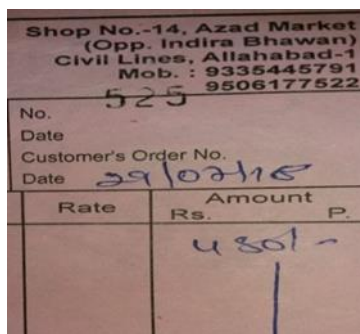


Figure 1: Questioned Sample (Q1)



Figure 4: Flipped and Colored Filtered image

## **Conclusion**

The two cases demonstrated that a number of features were associated with image manipulation and could be easily detected by using standard image processing application. The use of latest image processing software could greatly assist in the evaluation and detection of documents as demonstrated in these two cases where alteration was found on the year of the date in the receipts.

## **Reference**

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