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PRINTING OUT COMPUTER-AWARE DATA ALONG WITH HUMAN-AWARE DATA ON PAPER

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Printing out Computer-aware data along with Human-aware data on Paper

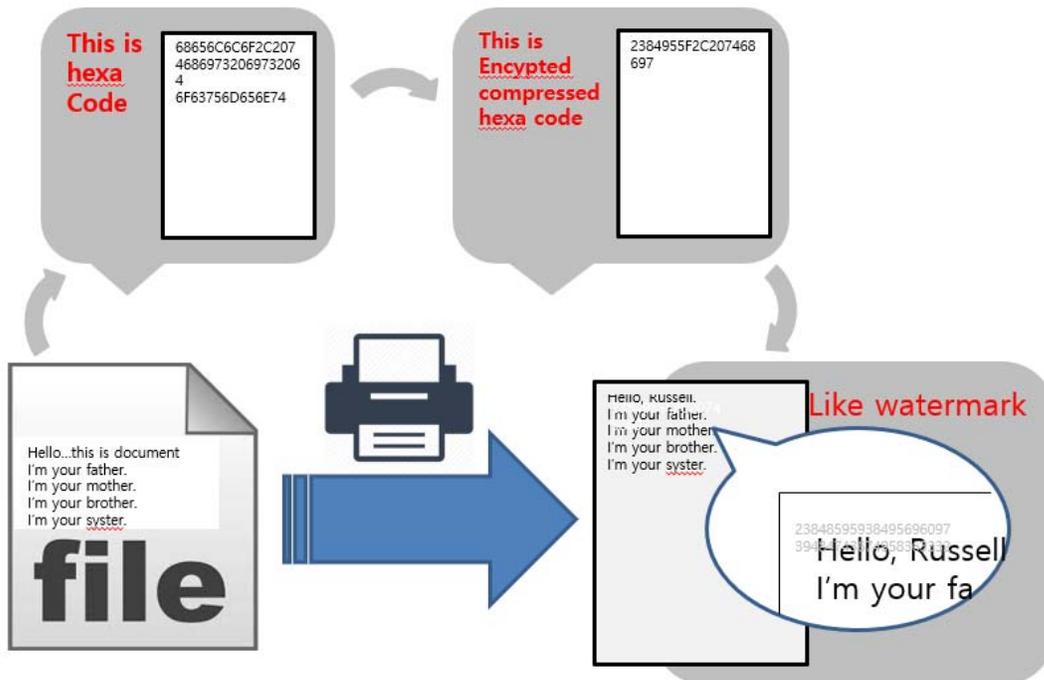
This disclosure relates to the field of marking computer-aware data into a format which human is not aware of along with human-aware data on paper.

It means a paper is printed out with both human-aware data and computer-aware data corresponding to human-aware data. The computer-aware data represents binary (or hex) code which includes both the converted code corresponding to human-aware data and meta data which can have additional information. The binary code can be encrypted and compressed if in need.

To make it clear, let's assume the text to be printed is "Hello Russell".

Human-aware data is "Hello, Russell" text itself. And, computer-aware encrypted and compressed data for "Hello, Russell" would be "0x495906939..." or "0100110101010101011..." which only computer is aware. These encrypted/compressed data are physically loaded in paper by being marked in watermark form. Marking form is not important, it can be watermarking, engraving or QR code. The important thing is to load binary code physically on paper along with human-aware data(text). In addition, binary code can include useful meta data such as font info, color info, position info and size information on human-aware data(text). These data are extracted back from paper by printer or specific device and then can be utilized in various way.

Here is the figure for process that the content of normal file is converted into both human-aware and computer-aware format and printed out to paper in watermark way. Two different data are layered and overlapped. A user can recognize human-aware data only.



The existing disclosure is to print only meta data as a QR code format on paper. So, its utilization is very

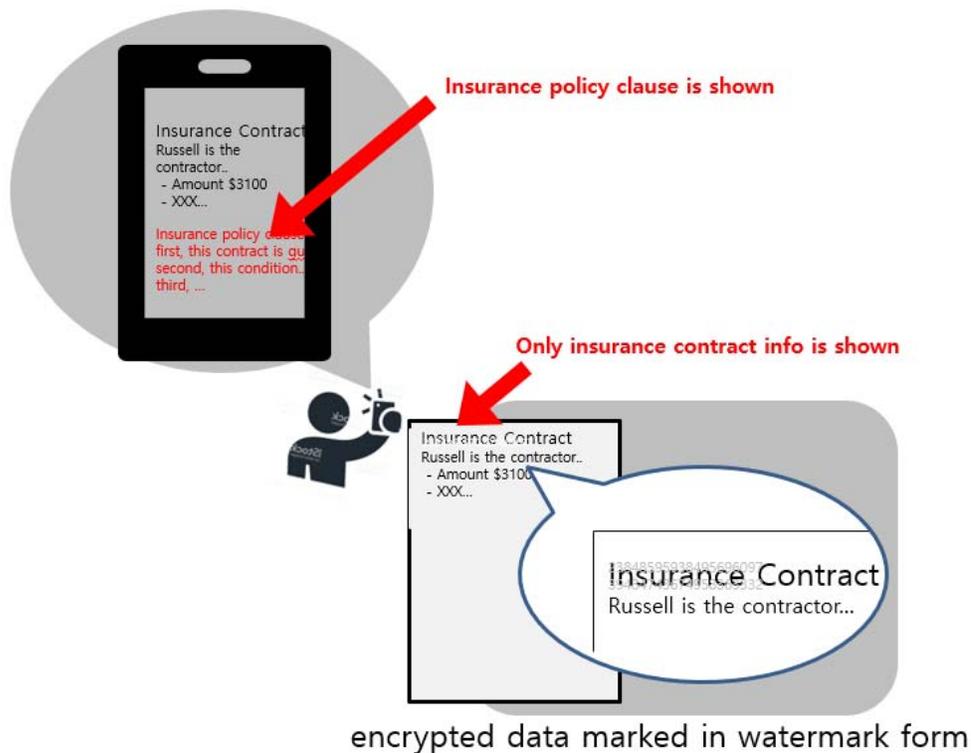
limited because it has no computer-aware binary data corresponding to human-aware text. In some another disclosure, such data are extracted from specific server. But, for this idea, any server is not necessary. No dependency of other things because paper itself has its own data.

There would be many instances of utilization using the binary code extracted from paper.

These could give us great user experience in the field of saving storage space, security enhancement and restoration.

First, it can save paper space by selectively printing out according to importance priority.

For example, it can be used in the field of insurance contract paper. the concept is that only the important contract info is to be printed out on paper in human-aware format, and insurance policy clauses(let's say not that important but large in quantity) is to be printed out on paper in computer-aware encrypted/compressed format under human-aware text. by doing so, paper space can be saved pretty much. After that, user can see the insurance policy clauses through specific printer/device and can also print them out in human-aware format. This scenario is possible because specific printer or device can extract the binary code from paper and modify them with meta data (font or size info.) and then form them in human-aware text so that a user can recognize them. As shown in the below figure, a user sees only insurance contract info with his naked eyes. But, when he sees it through specific device logged into proper account, he can see both insurance contract info and insurance policy clauses.



Second, Security policy can be applied on contents (binary code) through encryption/decryption on paper in connection with account info. Depending on account with which a user logs into specific printer/device, only the allowed user can see only the approved content out of binary code, not for all. This is very powerful

security enhancement on paper.

Third, it can restore original content of paper. usually if some part of paper was lost or torn up, a user can never see it anymore. But, if there are some computer-aware data left on the rest of lost paper, it could be restored easily.

This disclosure will provide users with various user experience and enhanced security model.

Disclosed by Chulgee Lee and Jihyun Yoon, HP Inc.