2D-Barcodes for Discount Coupons (MWH4-12)

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OVERVIEW

The 21st century saw a surge of smartphone technology, which are able to exploit 2D-barcodes – cost-effective channels to store huge amounts of information. The use of 2D-barcodes to realize discount coupons in shopping malls is proposed here.

Customers will scan 2D-barcodes from retail stores with their smartphones. Each barcode contains a unique piece of a discount coupon in addition to commonly found texts and URLs. Once sufficient coupon pieces have been obtained, the discount coupon can be completely recovered and generated for the user as a new 2D-barcode.

This can trigger a chain effect in customer purchases, subsequently maximizing turnover, and thus profit, for participating stores.

METHODOLOGY

The system workflow can be divided into three modules.

In encoding, a 2D-barcode is generated from an input message and coupon piece. Decoding is the reverse process of encoding. Lastly, the whole coupon is recovered from decoded pieces through the Reed-Solomon erasure decoding, and is generated as another 2D-barcode.

Barcode encoding:

Input message

Decoding:

Coupon recovery:

RESULTS

Erasure correcting capability of Reed-Solomon codes: $S \leq n - k$

For $l$ = no. of barcode scans to recover coupon and $N$ = no. of different barcodes available,

The required RS code rate for successful coupon recovery is $k/n < l/N$

CONCLUSION

In this project, a smartphone app which scans a special kind of 2D-barcode and generates a 2D-barcode discount coupon from only a fraction of the original coupon information has been developed. The app is intended to maximize the sales revenue of participating stores through a promotion scheme that exploits the 2D-barcode technology. Satisfactory performance of the app also opens the path for new, environmentally friendly discount coupons.

Source: www.eMarketer.com