

Advertising Efficacy Research on Electric Paper Applications for Advertising Displays in the MRT Station

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Abstract

As global environmental consciousness emerges, use of high technology to reduce environmental pollution has become a critical imperative for economies the world over. In recent years' development and applications of ICT monitors have increasingly served to displace traditional paper based displays, yielding tremendous environmental efficacy. Digital e-paper displays enjoy numerous competitive advantages including energy efficiency, eye friendliness, resilient durability, and readability, but are currently generally only deployed in e-book uses, so enhancing their application scope, in addition to relying on their reading comfort, the market will no doubt develop appreciable economic and environmental benefits. Hence this study deploys the perspective of applications innovation, to explore uses of e-paper solutions in MRT advertising contexts on the advertising efficacy aspects of both advertising memory and advertising attitudes. This research relies on in situ experimental methods, at an existing MRT station in Taipei on the island of Taiwan, through convenience sampling to select 100 study subjects, who were asked to view two encased displays (either a digital e-paper display or paper display) with public notice contents, prior to completing the study survey and statistical analysis of the valid responses. The study findings indicate that, for the general public MRT patrons, digital e-paper advertising solutions yielded optimal efficacy for both advertising memory and advertising attitude, with significant results along the dimensions of both advertising receptiveness and interest.

Introduction

As digital displays have arisen, some former paper applications have been replaced by digital displays. Among the digital display monitor industry, LCD, LED and e-paper solutions have emerged as preeminent emerging new products, as monitor firms anticipate softscreen flexibility to remain a marketplace focal point. While from e-paper technology, market, and applications related studies, one can surmise that digital displays will rapidly grow, as indicated in Figure 1

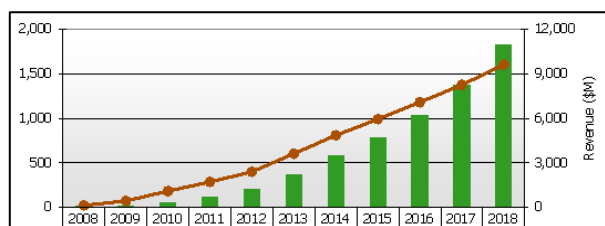


Figure 1. E-paper Display (EPD) market demand and production forecasts

E-paper display products enjoy numerous competitive advantages, including: 1. Lightweight, thin, and flexibly malleable; 2. Free from backlighting requirements, and requiring relatively less energy than other monitors; 3. Excellent readability, relying on light reflection properties for viewing, so that at any angle of sight and in any lighting conditions they remain eminently readable; 4. Useful for up-close reading; 5. Mimic actual paper in reading and do not exacerbate visual fatigue. In addition to all these features, e-paper also serves as an energy-efficient, carbon reducing solution, permitting a broad range of applications much closer to paper than other monitor options can facilitate, as shown in Figure 2.



Figure 2. E-paper tactile flexibility characteristics

Global mass rapid transport systems are commonplace, and their emergence has generated many new opportunities for advertising. Digital e-paper displays focus on small size applications, so this study proceeds from a perspective of fostering innovative applications, to explore digital e-paper display uses amidst the mass pedestrian commuter traffic of the MRT system in Taipei for medium sized displays of public notice message advertising, to discuss comparative advertising message and medium efficacy for digital e-paper display facilitated advertising and traditional paper advertising.

Research Methods

This study uses an empirical approach, to explore for significant variation among MRT station digital e-paper display case solutions and traditional paper advertising. The independent variables (X) in this study are the digital e-paper display and traditional paper; the dependent variable (Y) is advertising efficacy: across the dimensions of advertising memory (message understanding, message transmission reception accuracy, and content recall) and advertising attitude (product interest, medium receptiveness). Convenience sampling resulted in selection of 100 study subjects, who were asked to view two display case public notices (the digital e-paper display notice and a traditional paper notice as indicated in Figure 3) for one minute each before undertaking the study survey. The study flowchart is indicated in Table 1.

Table 1. Study Process and Flowchart

Independent Variable (X)	
Paper	E-paper
Dependent Variable (Y)	
Advertising Efficacy	
Advertising memory dimension	Advertising attitude dimension
Message reception accuracy	Media receptiveness
Content recall	Product interest
Message understanding	



Figure 3. The digital e-paper display notice and a traditional paper notice

Results and Findings

Message Reception Accuracy

The survey relied on five single answer multiple-choice items, to explore accuracy of message reception after engagement with the advertising display. Table 2 indicates that the digital e-paper display message reception accuracy was higher than for traditional paper displays.

Table 2. Single answer multiple-choice item comparison of e-paper display with traditional paper

	Mean	SD	Skewness	Kurtosis
E-paper	.6171	.30143	-.372	-.776
Paper	.4705	.28145	.129	-.657

Content Recall

This dimension relied on two multiple multiple-choice items, to select overall advertising content recall items in accordance with the actual experimental conditions. Figure 4 indicates that accurate recall was clustered and significant in digital e-paper display, while traditional paper display related responses were distributed evenly and with higher errancy.

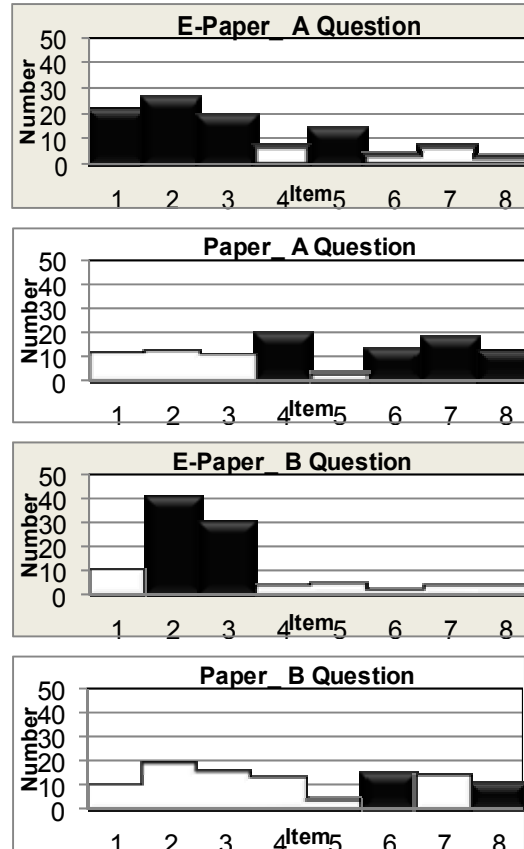


Figure 4. E-paper and paper multiple answer multiple-choice item responses (Black responses were accurate)

Message Understanding

This dimension explored understanding of the message sought to be conveyed, and Table 3 indicates that the median scores for digital e-paper display was greater than for traditional paper, implying that e-paper display understanding was better than for traditional paper.

Table 3. Comparison of message understanding for E-paper and traditional paper

	Mean	SD	Skewness	Kurtosis
E-paper	4.2235	.8762	-.296	-.192
Paper	3.9922	.9171	.351	-.309

Medium Receptiveness

This dimension explores receptiveness of these media, and Table 4 indicates that digital e-paper display receptiveness was significantly higher than for traditional paper, thus medium receptiveness for digital e-paper display was greater than for traditional paper.

Table 4. Comparison of medium receptiveness for E-paper and traditional paper

	Mean	SD	Skewness	Kurtosis
E-paper	4.2235	.8762	-.296	-.192
Paper	3.9922	.9171	.351	-.309

Interest

This dimension considers the product interest resultant from the public notice contents, and Table 4 indicates that digital e-paper display evoked significantly higher interest than paper displays, hence digital e-paper display generated product interest is greater than for traditional paper.

Table 4. Comparison of interest for E-paper and traditional paper

	Mean	SD	Skewness	Kurtosis
E-paper	4.3978	.8976	-.357	-.443
Paper	3.1543	.7766	.232	-.681

Summary

Analysis of the study data yielded findings that the public MRT commuter-pedestrian traffic were uniformly more favorable to the efficacy of digital e-paper display over traditional paper advertising solutions in terms of message reception accuracy, content recall, message understanding, medium receptiveness and product interest; and especially so for medium receptiveness and product interest dimensions where the variance was significant. Moreover biodemographic characteristics of the study subjects, in terms of gender, age, occupation, or commuting frequency, were not significant on advertising efficacy dimensions. Thus, one can conclude that the general commuting public finds the evocative attractiveness of digital e-paper display solutions eminently more stimulating and efficacious than for traditional paper displays.

This empirical investigation found that the commuting public were strongly interested in interacting with digital e-paper display public notice advertising methods, from which the study infers that digital e-paper display solutions enjoy optimal feasibility for displacing traditional paper advertising. We therefore anticipate tremendous future growth of e-paper advertising in the global urban MRT context and other indoor display milieu, generating not only the desired efficacious advertising results, but also affording the public with a comfortable, highly stimulating digital reading media, concomitantly achieving the environmentally desirous objective of reduced paper usage.

References

- [1] C. In-Jae, and I. Kang: Flexible Display Technology –Opportunity and Challenges to New Business Application (2009)
- [2] Information on <http://www.epapercentral.com/technology-update>

Author Biography

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