



**OFFICE OF
INSPECTOR GENERAL**
UNITED STATES POSTAL SERVICE

Mail Innovations

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Executive Summary

Despite the sharp increase in digital communications in recent years, mail still elicits a strong connection with recipients. Past work by the U.S. Postal Service Office of Inspector General (OIG) reveals that mail is a critical piece of an omnichannel strategy, which gives consumers a seamless and meaningful experience across a variety of media channels and provides marketers with a rich source of useful information. Now, more than ever, advertising campaigns must compete for recipients' attention, as people are exposed to hundreds, if not thousands of advertisements on a daily basis. To give consumers of all ages advertising messages that are relevant, interesting, and dynamic, mailers can incorporate a number of innovations into their mailpieces. These innovations can allow the marketing message to stand out, either by providing additional content in an easily accessible digital space, incorporating handy electronics into the mailpiece, or using unique materials and design to capture the reader's attention.

This paper provides an overview of ten mail innovations that range from commonly used and well-known tools to some that are still emerging, and even one that is still in the research and development phase. The OIG interviewed companies that create and support these innovations to learn more about them and what they can do to strengthen a mail campaign. These innovations can be more effective engaging customers and garnering a positive response, either in terms of recipient feedback or sales metrics.

Each page of this paper highlights a separate innovation and includes information a postal stakeholder might want to know before investing in a new technology, such as price, reported response rates, how the innovation is made, how it is used, case studies, demonstrations, and what type of business intelligence the sender receives from responses. The paper organizes these innovations in one of the following three categories:

- Connected mail, which through the use of a mobile device or computer, connects recipients to a digital experience that allows users to choose how they would like to engage with the product.
- Electronic mail, which includes an embedded electronic component, like a video screen.
- Dimensional mail, which includes innovations that transform mailpieces, either by using nontraditional ink, materials, or designs.

Category	Innovations Highlighted in This Paper
Connected Mail	QR Codes
	Augmented Reality
	Near Field Communication
	Webkeys
Electronic Mail	Video in Print
	Mobile in Print
	Conductive Ink
Dimensional Mail	Interesting Inks
	Customized MarketMail
	3D Mail

Using mail innovations, including those highlighted in this paper, enhances the effectiveness and value of mail for both senders and recipients. These innovations can allow senders to better capture their customers' attention; provide more information than can typically fit in a standard mailpiece; create an instantaneous, easy-to-use buying experience; and receive feedback on how customers are interacting with the mailpiece. Senders could also benefit from increased brand awareness while building corporate goodwill.

Innovative mailpieces can also provide value to recipients, as they can give the recipients control of the advertising experience in which they engage. Many of these innovations provide outlets for instantaneous access to more product or brand information. They could also provide coupons, contest entries, real-time directions to the nearest store, games, or exclusive previews of new products. The goal of these innovations is to engage and inform recipients. This could be in the form of bonus content, like an online game, or something to put on their refrigerator or office desk or give to their children. Higher quality mailpieces can make the recipient feel appreciated by the sender.

This paper is intended to raise awareness about various mail innovations and give the reader enough information about each innovation to help them think about how they can incorporate these innovations into their own communications campaigns.

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Introduction

Direct mail continues to be one of the most powerful mediums for marketers to communicate their message, but various print innovations can help companies make their physical mail resonate even more effectively. To maximize the impact of a mailpiece, companies need to evaluate the role of direct mail in the context of a larger integrated marketing campaign. Specifically, companies should first consider the goal of the campaign and the message they hope to communicate. Then, companies should evaluate which medium can help them best convey their message to consumers. When direct mail is chosen, companies could benefit from incorporating innovative features into the mailpiece. Using innovative design and technology features in a direct mail campaign allows the sender to draw attention to its message and more effectively communicate with the recipient. Targeting is important when incorporating mailpiece innovations, both because of the additional cost of nontraditional mail and the importance of providing an integrated experience recipients can easily access and enjoy.

This paper highlights 10 mail innovations that can make mail more effective, ranging from the commonly used and well-established to the latest and most cutting edge. It is intended to give readers a useful tool in understanding these innovations and may aid them in choosing an innovation that can help them achieve their goals while still factoring in price, success metrics, and other relevant criteria. The number of companies the OIG contacted and the promotions identified in this white paper represent a sample of print innovations available in the marketplace, but is not an exhaustive list. As technology evolves and advertisers find new, creative ways to present company messages, more innovations in direct mail will likely become available. This publication is provided for purposes of educating stakeholders about some innovations available for mailers to enhance hardcopy communications. Statements made in this paper were provided by the companies interviewed and do not reflect the opinions of the OIG. The OIG does not endorse or warrant any product or company described herein.

Background

An increasing number of Americans are connected to the Internet and use it to complete transactions, gather information, and communicate. However, past work by the OIG has demonstrated that there is still a place for mail in the everyday lives of Americans. The OIG recently conducted a body of work aimed at better understanding how mail is used today, which parts of mail are most valued, and what role the Postal Service can play in the future. In one project, the OIG completed focus groups with Digital Natives that were 16–25 years old.¹ Most of the Digital Natives reported that they checked their mail daily, and many agreed that their perception of companies that sent hardcopy advertisements was more positive than companies that did not. Digital Natives were most interested in mail that

¹ U.S. Postal Service Office of Inspector General, *Enhancing Mail for Digital Natives*, Report No. RARC-WP-14-001, November 18, 2013, https://www.uspsoig.gov/sites/default/files/document-library-files/2013/rarc-wp-14-001_enhancing_mail_for_digital_natives.pdf.

integrated digital features or stood out from traditional hardcopy mail, and they said they were more likely to keep and share this type of mail.

These findings led the OIG to host a discussion forum entitled “Enhancing the Value of Mail.”² The forum brought together key industry players representing design companies, printers, U.S. Postal Service officials, and mailers to discuss how mailpieces could be more effective. Specifically, the representatives discussed their companies’ use of cutting-edge technology and print innovations to make mail more personal, relevant, digitally enabled, and central to the consumer’s experience with a brand or product. An important takeaway from this event was that mail can be made more effective through relatively easy, inexpensive tools. These tools are being underutilized in the marketplace, especially with small and medium business mailers, perhaps because there is a lack of awareness about their availability.

Postal Service Promotions

The Postal Service has taken steps to encourage its business customers to enhance the value of mail by offering discount promotions for mailpieces that include various innovative features. The Postal Service’s upcoming 2014 promotions include some of the innovations highlighted in this paper, but the majority of these innovations have not yet been part of a Postal Service promotion. Postal Service promotions are intended to increase the value of transactional and direct mail and to retain or sustain its long-term growth.³ Promotions can be beneficial both to postal customers, by providing a discount for those that participate, and to the Postal Service, by increasing mail volume and revenue. Information about which innovations are featured in Postal Service promotions in the remaining months of 2014 can be found on the Key Features of Mail Innovations matrix that follows this introduction.

The majority of companies that have taken advantage of these promotions have been large mailers, according to a Postal Service official. This may be because the average discount of 2 percent may not incentivize smaller mailers to participate, while this may represent enough of a discount for large mailers to pursue innovations. Additionally, the timing of the promotions, which typically run about two months, make it more difficult for smaller companies to participate. According to a Postal Service official, small to medium businesses have had a more difficult time pursuing these discounts, as the constrained time period and small promotional discount often do not fit into their budget or mailing schedule.

2 U.S. Postal Service Office of Inspector General, *Enhancing the Value of Mail Follow-Up: Discussion Forum Recap*, Report No. RARC-IB-14-001, April 3, 2013, <http://www.uspsoig.gov/sites/default/files/document-library-files/2014/rarc-ib-14-001.pdf>.

3 U.S. Postal Service, “2014 Mailing Promotions and Incentives Calendar,” https://ribbs.usps.gov/MAILINGPROMOTIONS/documents/tech_guides/2014MailPromotionsSummary.pdf.

Small and medium mailers may also be less likely than larger businesses to know about the promotions the Postal Service offers, as they tend to have fewer resources available to track this information and understand the details required to be eligible. However, small and medium businesses could benefit the same, if not more, from incorporating innovations into their direct mail campaigns. This paper provides an overview of innovations that often lead to higher response rates, rich feedback from recipients, and higher brand recognition. Innovations, some relatively simple and others more complex, can create a significant impact on the effectiveness of campaigns.

Research Activities

To identify and summarize potential print innovations that could enhance the value of direct mail, the OIG received input on which innovations to feature from various sources, including the Organic and Printed Electronics Association and presentations and demonstrations at the National Postal Forum. The OIG then contacted 25 companies and interviewed all that responded. More information on methodology and a list of the companies that provided resources for this project can be found in the appendix.

Information Categories

The print innovations featured in this catalog are divided into three main categories: (1) connected mail, (2) electronic mail, and (3) dimensional mail. Connected mail, through the use of a smart device or computer, connects recipients to a digital experience that allows users to choose how they would like to engage with the product. Electronic mail includes a self-contained electronic component, like a light or video screen. Dimensional mail includes innovations that transform mailpieces, either by using innovative ink, nonpaper material, or unique designs. Each page of the paper provides an overview of a different print innovation and includes some of the following information:

- *Price* – This describes how companies that provide this innovation determine the price. This section also provides any specific pricing information the OIG received through interviews with the companies offering innovation services. The prices often depend on a variety of factors, and may be subject to change.
- *Analytics* – This describes what information the company can receive about the use of its product. This could include information detailing when, where, or how often the digital component is activated.
- *Effectiveness* – This describes any data available on how much the innovation engages the user or drives the user to action. This could include information about the amount of time consumers engage with the piece and how often the piece is viewed or used.

- *How It Is Made* – This describes how each innovation works, including the technological requirements, elements necessary to make the innovation function, and how many steps it takes to create a mailpiece with this type of innovation.
- *User Experience* – This details what type of experience the innovative feature provides the user.
- *Response Rates* – This details recipient response and examples of the innovation’s success in engaging consumers.
- *Demos* – This provides links to videos of the innovation in action or presentations about how the innovation works.
- *Case Studies* – This provides sample case studies of the innovation from the companies the OIG interviewed.

The matrix on the next page highlights some key features of the various mail innovations detailed in the rest of the paper. The matrix is intended to allow the reader to easily compare these various innovations to determine which could best meet the reader’s needs.

Summary of Key Features of Mail Innovations

	QR Codes	Augmented Reality	Near Field Communication	Webkeys	Conductive Ink	Video in Print	Mobile in Print	Interesting Inks	Customized MarketMail	3D Mail
How is it priced?	By Month or By Campaign	By Month or By Campaign	By Campaign	Per Piece	Per Piece	Per Piece	Per Piece	Per Piece	Per Piece	Per Piece
Are past success metrics available?	✓	✓	✓	✓		✓	✓		✓	✓
What do consumers need to use the innovation?	  	  	 		  					
Can it track consumer use of the innovation?	✓	✓	✓	✓	✓	✓	✓			
Does the Postal Service offer a promotion?*	✓	✓	✓							

*The promotions for 2014 have already been set, with two remaining. The U.S. Postal Service released a list of proposed 2015 promotions, but it has not yet released its final promotion calendar. Promotions that encourage the use of emerging technologies may encompass a number of the innovations described within this paper. Mailers should verify an innovation's eligibility with the U.S. Postal Service.

Legend =

-  Smart Device
-  Mobile App
-  Internet
-  Computer
-  Eyes

QR Codes

Quick Response (QR) codes are perhaps the most common way to bring a digital component to print communications. QR codes typically appear as a black-and-white grid of squares, an obvious sign that a printed page is a gateway to rich digital content, but they can also be designed with different colors or a logo. Scanning a QR code with a smartphone or tablet can enable access to various online sources, such as directing a person to a website or allowing them to download a coupon. QR codes are quick and convenient for consumers, while cost effective for businesses.

Quick Facts

Price	Some basic QR code generators are free, while other QR code services can cost \$5 per month or more. Price depends on the content communicated via the code, the traceable consumer information collected, and whether the QR code company helps create the mobile experience.
Analytics	The QR code can track when, where, and how often each code is scanned. The QR code scan can determine which language is dominant on the phone or tablet and change the message to that language. The website the QR code leads to can also track click-through information.
Effectiveness	One QR code scanner company reported each of its users scanned an average of four QR codes in the first quarter of 2014 (with 5 million active users).



How It Is Made

- Many companies provide QR code generators, which create unique QR codes that contain the data required to guide users to an array of experiences using their smartphone or tablet.
- Upon scanning a QR code, the phone or tablet automatically opens a web browser or another application to access the digital content. QR codes always lead the user to information housed on the Internet so the consumer must have access to an Internet connection.



User Experience

- To scan a QR code, a user needs a smartphone or tablet with a QR reader application (app). QR reader apps are widely available and many can be downloaded for free.
- Scanning a QR code can activate nearly any experience a smartphone or tablet allows, such as opening a website, launching a prefilled email or text message, dialing a phone number, downloading contact information, opening an application (or directing the user to download one), viewing a video, and more.



Response Rates

- One company reported that it processed 21.8 million QR code scans in the first quarter of 2014, up 20 percent from the same period in 2013. The company's quarterly report, issued in 2014, found that users of all ages employed QR codes, with the number of scans fairly even across people between the ages of 25-55 years.
- The most scanned campaigns included QR codes that gave consumers more product information or led to a video.
- Customers reported that they most liked QR codes that led to an app download or gave them more product information.



Click the Links to Learn More

Demos

https://www.youtube.com/watch?v=eWMoqj7ds_Y

Case Studies



Augmented Reality

Augmented reality (AR) is a technology that allows users to see previously static content on their mobile device, including a smartphone or tablet, in a new, interactive way. AR requires a user to download an app to reach bonus digital content. AR takes a physical communication, like a magazine advertisement, and activates a digital experience to create an alternate “reality” by superimposing images onto a mobile device’s camera screen. AR is designed to extend the print campaign and incorporate an interactive experience that gives the recipient more product information.

Quick Facts

Price Pricing schemes vary from one company to another. Some AR companies have a pay-per-use system, where a client pays an annual fee for the AR company to store the advertising image in its database and keep the app active. These start at \$60 per year. Some companies offer full campaign services, where they assist in the creation of the print material integrating the AR features. These campaigns are priced individually.

Analytics AR companies can track the total number of scans, the number of unique users, the length of time a user spends on the app, click-through rates, location, and time of scans.

Effectiveness One company reports that the click-through rate for its AR app is 87 percent, which means that almost nine out of ten users that scanned an advertisement engaged with AR app content. A marketing company found that study participants valued products with an AR campaign 33 percent higher than those without.



How It Is Made

- Companies providing AR services maintain a catalog of images that can be scanned by a mobile device. AR does not use a barcode, as the full advertising image is in the AR company’s database.
- Some AR companies help craft the user’s experience by designing the AR experience for the client. Other companies provide software programs that allow the client to make their own experience through user-friendly tools.
- It is important to include information in the print advertisement that entices the recipient to access the AR feature. The sender should make it clear to the recipient that the advertisement’s extra functionality and information is worth the effort it takes the recipient to scan the piece.



User Experience

- When users see an advertisement with an AR capability, they need to first download an app to their smartphone or tablet in order to access the additional content. The user must be connected to the Internet to activate the AR feature.
- Once the app is downloaded and the image is scanned, the technology adds something to the view on the user’s screen that was not there before. The user can choose which parts of the AR experience to interact with.
- AR experiences can lead users to watch a video, listen to music, make purchases through mobile commerce, virtually try on makeup or clothing, play a game, get directions, receive real-time customer reviews, and access e-books of information about the brand or product.



Response Rates

- Hidden Creative, a marketing and training company, found that consumers were 135 percent more likely to purchase a product they viewed through AR than a product they saw in a traditional advertisement.
- Some AR components prompt users to share their experience with the app through social media outlets. This creates a higher pass along rate and greater customer interaction.



Click the Links to Learn More

Demos

<https://www.youtube.com/watch?v=vDNzTasuYEw>

https://www.youtube.com/watch?v=VwMqaa3w-l8s&list=UUpt_OfKB-GLSC7Nx6mG2AFEg

Case Studies



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Near Field Communication

Near field communication (NFC) is a technology that allows a passive chip, or tag, to communicate with a cell phone through radio waves. NFC enables digital features to automatically engage consumers that have enabled mobile devices near advertising material with NFC functionality. It helps companies tell a better story using a mobile device as a conduit.

Quick Facts

Price	NFC tags can cost as little as \$0.40 each, but the majority of the cost of creating an NFC-enhanced campaign comes from designing the mobile content and programming the tags.
Analytics	NFC can track where and when a consumer scanned a tag. All website click-through rates spurred by the NFC tag are tracked through web analytics. NFC companies can also detect the type of device that taps the tag.
Effectiveness	Additional awareness about NFC capabilities is likely to increase NFC's use and enhance its effectiveness. A study by ClearChannel and Posterscope found that six in ten people with an NFC-enabled smartphone do not realize they have the capability. After being shown a preview and how to use NFC, 70 percent of the people interviewed said they thought NFC inclusion on their next phone was important.



How It Is Made

- NFC tags are so thin that they can be placed into stickers, which can then be attached to print advertisements.
- NFC tags are programmed to send the small amounts of information they contain to NFC-enabled devices, which are mostly smartphones. About 30 percent of the smartphones in America are NFC-enabled, according to Blue Bite, a company that uses NFC tags in marketing campaigns. More companies have recently announced their intent to add NFC functionality to their smartphones.
- When an NFC-enabled phone is held in close proximity to an NFC tag, the tag automatically directs the phone to the digital experience – the user does not need to download an app to activate the experience.



User Experience

- NFC tags have a very short bandwidth, meaning that a user can only get the information stored on the NFC chip by holding their phone very close to, or tapping, the tag.
- NFC allows a consumer to view rich media content, buy products, engage with a company through social media, download an app, sign up for offers, download a song, watch a video, and more. By directing an NFC-enabled device online, anything that can be done through a website can be done through an NFC tag.



Response Rates

- Eighty-eight percent of smartphone users would consider using NFC to interact with a poster that interested them, according to the 2013 *Mobile Path-to-Purchase* study from xAd and Telemetrics.
- According to one NFC provider, consumers most want to interact with an NFC tag to access something fun, to receive location information, or to access mobile web content.
- Companies that offer NFC tag services often incorporate both QR codes and NFC tags in their campaigns. One company reported a dramatic shift in the number of users choosing NFC, with a 488 percent increase in monthly NFC taps between May 2012 and April 2014.



Click the Links to Learn More

Demos

<https://www.youtube.com/watch?v=nJLTr6CEJh8>

<https://www.youtube.com/watch?v=suwappe3qnw>

Case Studies



Webkeys

Webkeys are designed to give consumers control over their physical-to-digital experience by personalizing the way they interact with mail, catalogs, or other printed materials. Webkeys digitally enable printed materials by integrating a USB drive that, when plugged into a computer, can initiate a user-specific experience. Some webkeys are secure, meaning that the data is locked. Online, consumers can be steered toward any web-based content that the designer chooses. Even offline, some webkeys allow consumers to view video or documents stored on the webkeys' internal memory.

Quick Facts

Price	Webkeys that function by pushing the user to a website cost about \$3 per piece. Advanced webkeys, such as eBridge Arcs, have built-in memory allowing for offline use, start at about \$5 per piece. Price depends on how much data the piece holds.
Analytics	Each webkey in a campaign has a unique identifier, allowing senders to track which recipients activate the webkey. Webkeys provide analytics about the user's experience, including: number of times used, when used, location of computer (IP address), and how the user interacted with digital content. Webkeys used offline store the user's information in the computer's cache, and that information is automatically sent to the webkey company the next time the computer is connected to the Internet. The analytics the webkeys collect allow the sender to cater messages to recipients in future correspondence.
Effectiveness	Webkeys generate a high response rate. The information gathered during webkey interactions is usually quite rich, and often includes the recipient's contact information and preferences.



How it is Made

- A webkey is a pre-programmed USB storage drive folded into or protruding from a hardcopy direct mailpiece. One advanced type of webkey, called an eBridge Arc, includes security encryption that ensures the USB drive cannot be wiped or reprogrammed.
- The webkey, when plugged into a computer, either automatically directs the recipient's browser to the sender's online content, or the webkey can display videos or documents, which can be viewed without an Internet connection.
- Webkeys can detect whether the computer has an active Internet connection, meaning that one webkey can deliver two experiences – one for offline users and one for those connected to the Internet.



User Experience

- Plugging a webkey into a computer via a USB port automatically takes the consumer to a specified destination: PDF, website, or other content.
- Some advanced webkeys provide the user with a template page through which the user can choose from different types of experiences. Advanced webkeys also allow users to access the webkey experience on their computer anytime, even without the webkey, as long as they have plugged in the webkey once.
- Senders can program the webkey to display personalized, interactive content for a uniquely tailored experience that the recipient can control.



Response Rates

- One company that produces webkey marketing campaigns said that the average enhanced campaign received a response rate of over 10 percent, with some campaigns returning a response rate as high as 78 percent.



Case Studies

Click the Links to Learn More



Video in Print

Video in print allows an advertisement to bridge the gap between physical and digital by putting a television screen onto a printed piece that the recipient can view. This technology embeds screens of various sizes into print media. The printed piece can have buttons to stop, play, or select between different videos. The piece can also be programmed to begin playing automatically when the page is opened. No Internet connectivity is required.

Quick Facts

Price	Video in print pieces with a 2.4 inch screen start at \$19.95 per piece, if 10,000 are ordered. This price goes up as the screen size increases, the memory on the piece increases, or the quantity ordered decreases.
Analytics	If the mailpiece has a built-in Wi-Fi connection, it can track how many times the piece is activated and, if the piece contains multiple videos, how many times each video is watched.
Effectiveness	A global telecom company using video in print found that each recipient opened the piece an average of six times. Users watched an average of 19 minutes of video from the piece, and recipients were still activating the piece four months after they received it. Another company reported a 21 percent increase in sales in stores using video in print units to market their goods.



How it is Made

- The self-contained video in print pieces have a paper pocket that contains the battery, LCD, shatter-resistant screen, speaker, and all necessary wires to control the buttons and video.
- Video in print pieces can hold between five and forty-five minutes of video.
- Units come with a rechargeable battery that hooks into a USB drive.
- The video screens range in size from 2.4 inches to 7 inches.



User Experience

- When a consumer opens a video in print piece, the video and audio can be cued to begin playing instantly. From there, the consumer controls the piece through stop, pause, and play buttons.
- The consumer can use buttons on the paper to rewind, fast forward, or begin another video. Video in print pieces can hold up to five separate videos.



Response Rates

- One company that creates video in print mailpieces reported that a piece it designed advertising a television show had a 98 percent recall rate.
- Buzz tracking for the television advertisement showed that the company received a 400 percent lift in social media and blog conversations.
- Starch Communications, a media research firm, found that inserts that included video in print delivered a 100 percent brand recall rate and a 91 percent pass along rate.



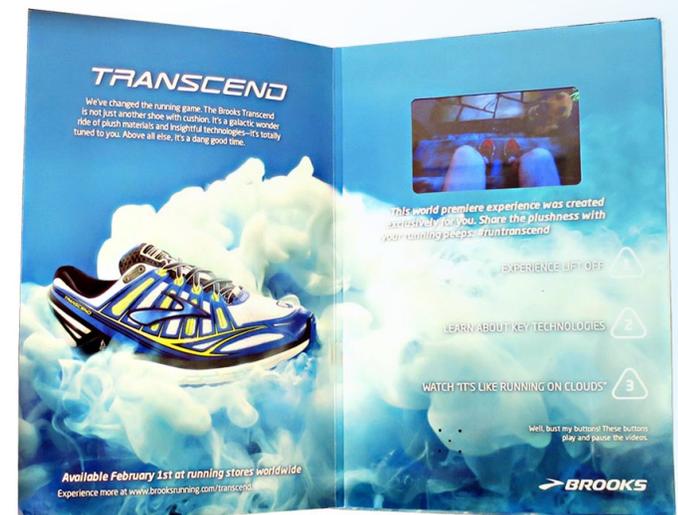
Click the Links to Learn More

Demos

<https://www.youtube.com/watch?v=eyivWk5R9qg>

<http://www.americhip.com/vid/vip-touch-video-in-print.html>

Case Studies



Mobile in Print

Electronics are getting thinner, and advertisers are getting more creative. With mobile in print technology, it is now possible to add a direct communication portal, such as phone or text messaging system, into a direct mailpiece. This technology would allow a user to contact a company through either a phone call by pressing a button on the paper, or through a text message via a keyboard on the paper. Mobile in print gives consumers the ability to quickly and easily contact a company and has the added benefit of providing consumers with a unique and memorable user experience. The piece can be used time and time again, and the return on objective has proved to be very high.

Quick Facts

Price	Mobile in print starts at \$52.65 per piece if 10,000 pieces are ordered. Mailpieces with both video and mobile in print start at \$71.55 per piece. Because of its price, targeting is imperative
Analytics	The mailpiece can track when a call or text was placed; how long the call lasted; and how many times the mailpiece was used to call or text the company.
Effectiveness	A technology company reported customers spent more time with mobile in print pieces than traditional mailpieces. Recipients accessed the mobile in print mailer an average of 3.8 times.



How It Is Made

- A Wi-Fi network is placed into the mailpiece, which runs the mobile technology. The mobile in print application is fully rechargeable via a USB cable that comes from within the paper. The mailpiece either has a microphone and speaker to enable a call or a keyboard with a screen to show the text typed.
- The standard activity limit is either 50 calls, 100 SMS messages, or 30 days, according to a company creating mobile in print pieces. Extended service is also available.



User Experience

- The mailpiece can have a “call now” button that connects the consumer to the company’s phone line to let the user place an order or get a price quote.
- The mailpiece can have a small, flat keyboard in it, allowing users to text their order or contact information to the company so the company could follow-up with the consumer once they prepared a contract or created a price quote.



Response Rates

- One company reported that response rates were over 66 percent.
- On average, recipients used each mailpiece to make two calls.
- Users spent an average of six minutes engaging with the mailpiece.



Click the Links to Learn More

Demos

<http://vimeo.com/92370890>

<http://www.americhip.com/vid/video-mobile-in-print.html>

Case Studies



Conductive Ink - Research and Development

Conductive ink is ink that can carry an electric charge and is printed on a hard copy page. Conductive ink can link a battery pack, processing chip, and any device that requires electricity. It can also be used to create interactive printed material, such as generating noise from a speaker, creating a Bluetooth connection that brings up a related app on a mobile device, or making a bulb light up. Conductive ink can be used to create buttons on paper that activate the electronic part of the piece. This innovation is still in the early stages of development, and many of the possible applications are in the testing phase.

Quick Facts

Price The price of conductive ink depends on many factors; each campaign is a different price depending on the power the piece needs to function and the expense of the electronic connecting to the piece (e.g., a light bulb or speaker). According to one company, shipping is currently a major cost, as shipping batteries carries certain restrictions. In the future, the company expects to see more electronic printing in local markets.

Analytics Conductive ink that activates an app on a mobile device allows the company to track usage through the app.



How It Is Made

- Conductive ink couples low cost electronics and printing. As computer chips continue to decrease in price and increase in capability, the ability to mass produce progressively more powerful printed electronics continues to rise.
- Companies that produce and engineer conductive ink work with printers to integrate the ink and electronic components into marketing pieces.
- Conductive ink is ink that is mixed with carbon, copper, or silver. The ink functions as the wire of the electronic device, connecting the components to create a working piece.
- Battery size and shape changes depending on the size and power of the piece. One company uses speakers that are 6 millimeters thick.



User Experience

- Users see a printed piece of paper, which could be a mailpiece, poster or some other hard copy communication, which includes some signal that it has an electronic component, such as a "press here." When the user touches the paper, the printed piece may light up, make a sound, or activate a mobile device through Bluetooth.
- Currently, there are limited uses for conductive ink. Electric engineers at conductive ink companies are rapidly developing new applications.
- Conductive ink can either connect to an electronic that is constantly on, such as a small light bulb, or the electronic can be activated by touching the piece.



Possibilities For The Future

- One company that is developing conductive ink listed many more future applications, especially with packaging. The company representative described a pill packet that could activate a timer when it was opened, allowing people to see how many hours have passed since they last took a pill.
- The company is also in the process of developing technology that would turn off the conductive piece in the dark. This would prolong printed electronics' battery life.
- Other possible developments include microphones, built-in volume control, increased Bluetooth connectivity, the ability to capture data from the user, the ability to direct a phone straight to a website, and the ability to interact with social media by pressing a button on the piece.



Click the Links to Learn More

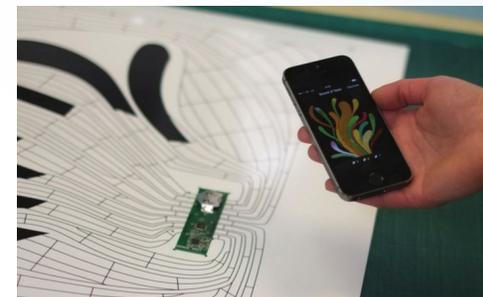
Presentations and Demos

<https://www.youtube.com/watch?v=bXBDJYdN3pM>

<https://www.youtube.com/watch?v=Atb0qjopErk>

<https://www.youtube.com/watch?v=lpXe6uzuM4M>

https://www.youtube.com/watch?v=KTpGCAi0oy-g&list=UUdysVgW_dLaglrqcc_CoDPA



Interesting Inks

Interesting inks can make any advertising message pop off the page. Chemical compounds can be added to inks to make certain colors disappear or reappear depending on temperature, moisture, or light exposure. These 'secret messages' can further engage recipients and add an interesting element to what would otherwise be a traditional-looking mailpiece. The inks are either made through adding a chemical powder to ink or adding the chemical compounds to a slurry, which is a mixture of the liquid ink and solid pigment particles that are mixed and milled to create the desired color and thickness. The inks described on this page require recipients to engage with the advertisement more than a traditional mailpiece because they have to do something to the advertisement in order to receive the full message. Some companies providing interesting inks can print the mailpiece, while others collaborate with local printers.

Leuco Dyes

There are a number of chemicals that can be added to ink that can change its color with variations in temperature. Changes in temperature can transform these dyes from clear to a color or from a color to clear. A change from a color to clear can reveal a printed message in the marketing material that was not visible under the leuco dye until the advertisement's environment reaches a certain temperature. Leuco dyes are also reversible, in that once you take the hot or cold element away, they return to their original state, as either a colored dye or a clear layer of ink.

Hydrochromics

These inks change color when they come in contact with liquid. They can either be reversible, meaning that the original image will reappear after the advertisement has dried, or the inks can be non-reversible, meaning that the image will permanently change once water is applied to it. To create an advertisement using hydrochromic ink, a layer of any color ink is first applied through the printing process. Then, the hydrochromic ink, which is white, is printed over it. When the hydrochromic advertisement gets wet, the image goes from white to clear, exposing the message printed beneath it.

Photochromics

These inks change color when ultraviolet (UV) light, like sunlight, comes in contact with the printed material. The image will return to its original state when taken out of UV light, unless it is exposed to the light for more than a day. After the advertisement is out in the sun for more than a day, the color change will be permanent because UV light slowly erodes the ink's ability to change back and forth. Photochromic chemicals come in a slurry or powder and can be added to any type of ink.

Flasher

Flasher is a recently developed ink technology that is based off of reflectivity. When consumers view the advertisement, they just see what is printed in regular ink. In order to get the full message, a consumer would need to apply a bright light, like a smartphone camera flash, to the printed piece. The photo of the advertisement would show the full message, including the portion not visible to the naked eye.

The Latest Buzz about Ink

A Sri Lankan newspaper got creative this year during National Dengue Week, an event aimed at raising awareness and helping prevent dengue fever, a mosquito-borne disease. The newspaper mixed citronella oil into the ink used to print the paper, so the paper itself became a natural insect repellent. The inclusion of the citronella oil in the ink newspaper motivated Sri Lankans to purchase and hold on to the papers. The newspapers sold out by 10 AM, and it increased newsstand sales by 30 percent. The readership increased by 300,000 when the ink was infused with citronella oil.

For more, see: https://www.youtube.com/watch?v=rMNO_6ytY9I

Customized MarketMail

Customized MarketMail, sometimes called shaped mail, is a category of mail that has unique characteristics, including interesting shapes, sizes, and materials. Customized MarketMail allows advertisers to think outside of the envelope, since, unlike traditional mail, irregularly shaped Customized MarketMail does not need to be enclosed in an envelope or box.

Quick Facts

Price	One company charges \$0.90 per piece for an order of 2,500 customized MarketMail pieces, which includes the shipping cost. Another company said that, on average, a marketing campaign using Customized MarketMail is two to four times the cost of a traditional direct mail campaign.
Analytics	Perforated reply cards and coupons are often found attached to or within a Customized MarketMail piece. These pieces allow a company to track the effectiveness of the advertisement. One company providing Customized MarketMail services reported that it has seen QR codes, augmented reality, and NFC incorporated into its shaped mail.
Effectiveness	One company reported that a traditional mailer that used a plastic Customized MarketMail piece saw almost double the amount of call activity after incorporating Customized MarketMail into its marketing campaign.



How It Is Made

- Mailers can work with a number of companies to design Customized MarketMail, which can include unique die cuts, a variety of sizes, material of varying thickness, and nearly any shape.
- The U.S. Postal Service has designated Customized MarketMail as a specific category and accepts these pieces under this designation, as long as they weigh 3.3 ounces or less. Pieces can be between 3 ½ and 12 inches high and between 5 and 15 inches long.
- Mailpieces under the Customized MarketMail designation can be made out of virtually any material, as long as they fit within the size requirements listed above. One company offered mailpieces in clear, thin plastic, green-friendly plastic, and pieces with an aluminum finish.
- Mailpieces in the Customized MarketMail category have a different shipping method than traditional advertising mail. Customized MarketMail must be delivered to a U.S. Postal Service Destination Delivery Unit, and there is a minimum of 200 pieces per mailing.



User Experience

- Customized MarketMail is delivered directly to the customer without an envelope, so the user is able to see the unique design immediately, and it often stands out from the rest of the mail in the stack.
- Customized MarketMail usually incorporates bright colors. It is often printed on unique materials, like plastic, hard foam, or metal. This mail not only looks different than traditional mail, it feels different as well.



Response Rates

- One shaped mail company reports that using shaped mail has been shown to increase responses by as much as 300 percent or more.
- A food and beverage company using Customized MarketMail saw a redemption rate over 10 percent with a cardstock Customized MarketMail campaign, and over 14 percent with a plastic Customized MarketMail campaign.



Click the Links to Learn More

Demos

<https://www.youtube.com/watch?v=hLpKuil69r0&feature=youtu.be>

Case Studies

3D Mail

Three-dimensional (3D) mailpieces are shippable, lightweight designs that, when opened, either fold, pull, or pop into a piece that stands on its own. The design allows a marketer's message to stand out.

Quick Facts

Price	The price of 3D mail depends on the quantity ordered, the type of 3D mail used, and the amount of design effort needed to create the mailpiece.
Analytics	While 3D mail does not always have a feedback element, other innovations like QR codes or NFC can be incorporated into 3D mail.
Effectiveness	One company that creates 3D mail reported that 84 percent of consumers it surveyed opened their 3D mailpiece multiple times. The company reported that consumers retained 3D mail for a longer period of time than traditional mail.



How It Is Made

- 3D mailpieces can either be custom designed, or a mailer can choose from a variety of stock designs available from 3D mail companies. These oftentimes colorful pieces take on many shapes and sizes.
- 3D mail companies print, cut, fold, and construct mailpieces that lay flat during shipment but transform when the mailpieces are out of the envelopes. Some companies that produce 3D mail also provide shipping services.



User Experience

- Recipients interact with 3D mail to receive the full message.
- Most pieces of 3D mail do not require assembly by the end consumer; when the consumer opens the piece, the 3D aspect comes together automatically.
- 3D mailpieces come in a variety of forms. Some fold out into free standing structures. Others allow the consumer to change the image on the advertisement by pulling a tab.
- A different type of 3D mail is one that grows through telescoping, meaning a series of smaller messages come out of the initial message.



Response Rates

- One company specializing in providing services to design and print 3D mailpieces reported that recipients are more likely to keep 3D mail. Additionally, consumers are likely to display these unique mailpieces at their workplaces and in their homes, which increases the 3D mail's visibility.
- According to CRMTrends, direct mailpieces that include a pop-up feature can increase response rates up to 40 percent when compared to a conventional, flat mailpiece.
- The Direct Marketing Association's 2011 Response Rate Report concluded that 3D mail is the most effective type of direct response marketing with an average response rate of nearly 5.5 percent.



Click the Links to Learn More

Demos

<https://www.youtube.com/watch?v=gB0tvPhgJTQ>

https://www.youtube.com/watch?v=ZzTRtUS66Hg&index=3&list=PL1jna1WSuMQKuRa-2dUr_MPyoByFc6FhGa

https://www.youtube.com/watch?v=_ph8Orr-bi_k&list=PL1jna1WSuMQLeeg-T0z2vQfpd42xM7E451

https://www.youtube.com/watch?v=PJWA-f0IAu70&list=PL1jna1WSuMQKuRa2dUr_MPyoByFc6FhGa

<https://www.youtube.com/watch?v=8KuEfXzf6c-M&list=PL1jna1WSuMQK-JEYvGDX6tzQN7tuvUkBtw>



Appendix: Research Activities

To develop this paper, the OIG contacted 25 companies offering innovative solutions for direct mail. The following companies responded, and the information they provided contributed to the content of this paper. The OIG interviewed 12 of the companies, while other companies provided studies, pricing, and examples. In addition to working with companies that provide mail innovations, the OIG also conducted research and interviewed representatives at the Postal Service and Organic and Printed Electronics Association.

The following are some of the companies that could provide innovative services, but this list is not exhaustive and does not represent an OIG endorsement.

Connected Mail

- Scanbuy – QR Codes
- BeQRious.com – QR Codes
- Mobile-barcodes.com – QR Codes
- Blippar – Augmented Reality
- Layar (now part of Blippar) – Augmented Reality
- Aurasma – Augmented Reality
- Metaio – Augmented Reality
- NFC-Forum.org – Near Field Communication
- Blue Bite – Near Field Communication and QR Codes
- Ninety2i – Near Field Communication and Webkeys
- Americhip – Webkeys

Electronic Mail

- Curveball Printed Media – Video in Print
- Ninety2i – Video in Print
- UVIAUS – Video in Print
- Americhip – Mobile in Print and Video in Print
- Novalia – Conductive Ink
- Bare Conductive – Conductive Ink

Dimensional Mail

- LCR Hallcrest – Interesting Inks
- ShipShapes – Customized MarketMail
- 3D Paper Graphics – 3D Mail
- Americhip – 3D Mail



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