
*Interactive Print:
“In the Palm of Your Hands”*

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Abstract

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The purpose of this study was to research the sociological reaction to interactive print being delivered in a way for consumers to interact using their cell or mobile phones. My hopes are that this research will provide insight to what current media can take advantage of current cell/mobile technology.

This study investigated conditions consumers currently use their cell phones and where print media has opportunity to take advantage of intractability with their target audience. A survey containing nine questions aimed at quantifying how consumers value their information in regards to reacting through their cell phones were sent out to the students in Graphic Communication Department and on Facebook as a way to gather information through social networks.

Results from 149 responses indicated that although most current mobile users did not know what Quick Response Barcodes were, the marketability of media using QR barcode technology showed promising. Printers and advertising or marketing agencies have opportunities to widen their market shares.

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Chapter I—Introduction

Background

Interactive print in America is just as static as barcodes are; they are primitive, relative to what current technology is capable of. For example, the most one can do to make packaging print interactive—other than the traditional barcode that allows scanning for price verification or inventory—is printing a web site address on a label or on the packaging and hope users or consumers would be interested or intrigued enough either by design or marketing to go to the web site to learn more about the product or advertisement. With the current mobile technology available, consumers should be able to take out their Apple iPhone or Blackberry, use the camera installed on their cell phone, scan a printed barcode and go immediately to the company web site. Suppose the consumer chooses a can of soup on the shelf at a market. Not only could the prospective consumer go to the manufacture’s web site to check for nutritional information, but also search for the product on Google or any other web-based search engine for price comparison, get reviews, check Weight Watchers’ web site to see how this soup affects their diet, and then download digital coupons on the web browser of their mobile device and get immediate discounts at the cash register by having the coupon verified on their mobile device.



Figure 1 - QR Code that links to Wikipedia
(EN) Main Page

This interactive technology exists, called QR (Quick Response) codes and it has been implemented and used for several years in Japan. The QR code was originally developed by a Japanese corporation called Denso-Wave in 1994. QR is currently used as the most popular type of two dimensional matrix codes that are in use with mobile phone technology, also known as “mobile tagging.” There is a need for this technology in the U.S. and Microsoft Corporation is also currently working to develop a domestic based technology that is similar, called “Windows Live Barcode.” This study asks the question(s): To what extent is the current American

market (consumer and available mobile product) ready for QR technology to be accepted in society? What fields or where in marketing can this be most effective, and in what ways are customers using this technology as means of interacting with printed materials?

There is a wide range of possible uses and applications for QR technology. With the debut of computer-technology enabled mobile devices rapidly expanding their market base such as the Palm Treo, Blackberry,

Apple iPhone and iPod Touch, availability and convenience for the consumer to access information becomes crucial in marketing business. Why would one want to bother taking the time to type in the Uniform Resource Locator (URL) into a small touch sensitive screen on a mobile device, when going to the web site on their mobile phone web browser can be easy as scanning or taking a picture? If one can get immediate access to information, would it not also drive compulsive buying, and could it not be marketed as a tool for consumers to make so-called “informed” decisions faster and easier? The business model based around QR technology is built upon making the decision-making process for the consumer more convenient, faster, and easier.

Goss International has taken the lead in the printing industry to take on the technology aspect of the cell phone industry and has embarked on GossRSVP, which combines the use of both text messaging capability and data-matrix two-dimensional barcode scans in order to use it as a marketing tool.

Purpose

The purpose of this study is to explore how beneficial is QR technology to marketing in United States by observing if the American public is ready for this kind of technology. Since the technology has already been implemented and users have become accustomed in Japan, the effect of consumer usage of QR codes will help predict how interactive barcodes can be used to benefit the average American consumer. This study will be reviewing statistical evidence based on questionnaire responses. Although QR codes are not yet implemented domestically as it is in Japan, making mock or sample codes through QR code generators from qrcode.kaywa.com and using downloadable mobile phone software to survey consumer response will help generalize how effective QR codes are in both the consumer and business world.

Chapter II—Literature Review

The term “QR Code” is in reference to “Quick Response.” However, the official naming of the technology is copyrighted by Denso Corporation in Japan as “QR Code,” though generation, marketing and distribution of individual barcodes are neither copyrighted nor proprietary per Denso.¹ The use of 2D barcodes - two-dimensional figures that represent data such as URLs - is widespread in Japan. The 2D barcodes appear frequently in advertisements and magazines, and allow users to access related websites by scanning these figures with mobile phone cameras.²

Although initially used for tracking parts in vehicle manufacturing, QR Codes are now used in a much broader context, including both commercial tracking applications and convenience-oriented applications aimed at mobile phone users (known as mobile tagging). QR Codes storing addresses and URLs may appear in magazines, on signs, buses, business cards or just about any object that users might need information about. Users with a camera phone equipped with the correct reader software can scan the image of the QR Code causing the phone's browser to launch and redirect to the programmed URL.³ This act of linking from

¹ Denso Wave Incorporated. QR Code. 2000. <http://www.qrcode.com> (accessed 20April2009).

² NTT Docomo, 2007. “Synchronization with Native Applications”.
<http://www.nttdocomo.co.jp/English/service/imode/make/content/barcode/function/application/>. Retrieved on 17April2009.

³ JIS X 0510:1999—signifies certification of QR codes in 1999 from JIS (Japan Industrial Systems) and also certified as ISO/IEC 18004:2000, Information technology—Automatic identification and data capture techniques—Barcode symbology—QR Code // JISX 0510:2004 revision restates the patent as a Two dimensional symbol—QR Code—Basic specification

physical world objects is known as a hard link or physical world hyperlinks. Users can also generate and print their own QR Code for others to scan and use by visiting one of several free QR Code generating sites.⁴

Though much of the application of the QR technology thus far has been mainly developed exclusively in Japan, the popularity of the usage and its application appeal has reached across Asia and Europe through Japan's trade networks. In his article comment to *The Australian*, national strategy director at media agency OMD, Rob Pyne writes, "Mobile (phones) should also be the future of the coupon industry too...Every brand should be thinking about using short codes or QR codes on their other forms of media so that consumers can immediately link through to interact with your brand on their mobile—it is the ultimate return path for compelling communications."⁵

The trend that has been embraced by the Japanese has not been unknown to Americans. For example, David Harper, the CEO of Winksite, a leading mobile content management and social networking software company, has written in his blog about QR codes and its impact as early as 2006. He highlights the basic knowledge there is to know about QR code technology and how it is used in Japan, including a survey based on Japanese consumers and how they have been using the technology in most recent years.⁶ He concludes his blog entry on QR codes as such: "The success of the Web was partly a result of the distributed development of local content and economies driven by individual passion. It's happening all over again on the mobile web. Be a part of it."⁷

With regard to engaging this print to be interactive with technology, David Ley of British Educational Communication and Technology Agency writes:

Some teachers in Japan are using QR codes to distribute resources to learners or in more innovative projects to allow interaction with real world objects (as with RFID) ...

⁴ "Barcode contents". *Zxing—A rough guide to standard encoding of information in barcodes*.

<http://code.google.com/p/zxing/wiki/BarcodeContents>. Retrieved on 17 April 2009.

⁵ Pyne, Rob. "Mobile strategy must be kept separate." *The Australian*, 27 April 2009.

⁶ Harper, David. "Mainstream America is Ready for Bar Codes—Converging 'Realspace' and 'Mobilespace'." *David Harper's Different Things*. 29 March 2006. <http://harper.wirelessink.com/2006/03/29/mainstream-america-is-ready-for-bar-codes-converging-realspace-and-mobilespace/> (accessed 20 April 2009).

⁷ Harper, "Mainstream America"

The BBC/Open University used a similar system for their Coast project. Data Matrix 2D barcodes were placed on signs around the coast allowing walkers with camera phones to connect to related text, directions, images, and audio...One of the main goals of ubiquitous computing is to provide relevant information, in the right form, at the time and place it is needed. If objects and devices can recognize you and know about their location and environment and automatically discover other devices and resources (multi-sensuality), then the potential for delivering the appropriate, 'just in time' information increases.⁸

Another online guru and web promotion and internet marketing scientist, Shawn Smith notes on his blog that the QR code may even become the messiah of the newspaper industry. He writes in his blog entry, "How QR codes could save newspapers from obsolescence" about the problems the current Newspaper industry is facing and providing some ideas that may possibly be solutions by incorporating QR codes to save paper space, make paper stories bookmark-able and portable, serve as an interactive shopping guide, real-time city guides, as well as a few other examples.⁹

Goss International has embarked on a similar technology for allowing consumers and target audiences texting or pre-set messages as a marketing scheme using ubiquitous cell phone technology. Their GossRSVP uses the data matrix format of two-dimensional barcodes, which is different from the QR code. Data Matrix format is one of the international standard codes which is recognized by UpCode, who supplies the technology behind GossRSVP. Where the QR code just uses simple data transfers, Goss RSVP uses a two-fold system of providing both the scan-able barcodes and text-enabled codes that users would just simply send text SMS (Short Message Service, commonly known as "text messaging" or "texting," for short) to the designated number which is registered with GossRSVP's system.¹⁰

⁸ Ley, David. *Ubiquitous Computing*. Technical Research Online Document, Coventry: British Educational Communications and Technology Agency (Becta), 2007. Retrieved on 20April2009.

⁹ Smith, Shawn. "How QR codes could save newspapers from obsolescence." *New Media Bytes | Online journalism, web production and promotion*. 8April2008. <http://www.newmediabytes.com/2009/04/08how-qr-codes-can-save-newspapers-from-obsolescence/> (accessed 20April2009).

¹⁰ Belanger, Roger. Telephone interview by Yumi Shiraishi, 04November2009.

What is unique about GossRSVP in comparison to QR codes is that it is a service of providing the back-end data retrieved from the user. For example, an advertisement agency or marketing group would decide to use GossRSVP code to print on their advertisement in the newspaper. The agency could then sign up for an account with GossRSVP and then have multiple promotions on their account. The service that the agency has signed up for is the data retrieval attached with the code. Not only could the agency get a barcode and text code pertaining to their promotion, but have the collected data assembled for them online, automatically notify the customer if they have any notifications in regards to the promotion, but give the agency a choice between winners being selected either numerically (e.g., every 20) or opt-in options.¹¹

¹¹ Goss International, Inc. 2009. "Text Messaging Solutions for Every Business!" *About: GossRSVP™*.

<http://gossrsvp.com/about/default.aspx> (accessed 06November2009).

Chapter III – Research Methods and Procedures

In order to measure in quantifiable data how QR codes could be incorporated to make print more interactive, the research methods for this study include descriptive research and content analysis. In his manual *Some Ideas About Doing Research in Graphic Communications*, Professor Harvey Levenson notes that descriptive research combined with content analysis is one of the most common ways to research psychological and sociological construct for a large population. I have originally thought of including an experiment with the Scientific Method incorporated, but as Levenson writes that Scientific Research is most applicable to laboratory research where human variability is not being tested or measured. As the purpose of this research on QR technology is to explore consumer response, I chose to omit the experiment as a component of my research. However, exploring the possibility of this research method has given me some ideas about how I would prefer to conduct the rest of my research.

Levenson notes that Descriptive Research studies are designed to determine the nature of a situation as it exists at the time of the study. Since QR technology and mobile phone technology in the United States have only recently joined forces in the open market, observing this current trend and consumer behavior lends well to descriptive research. Most of this will be done through a sample survey of intangibles, which will seek to measure psychological and sociological construct for a large population. For my topic, descriptive research and content analysis will be used to analyze the data retrieved from questionnaire surveys, develop results and draw conclusions.

In order to develop the research method, the following steps were considered:

1. Statement of the problem. My objective of this research is to:
 - a. Find out if QR Code technology is practical and fit for use in modern day American society.
 - b. In what fields and/or marketing realms can this technology be most useful?
 - c. If QR Codes can successfully make print interactive.
2. Identification of information needed to solve the problem. The following information will be needed:
 - a. Description of demographic/sample population.
 - b. What current technologies do the sample population adhere to.
 - c. To what degree can interactive print be affective to the average consumer.

3. Selection of development of instruments for gathering data. I chose to do two questionnaire/surveys for this. The first would be a general questionnaire that subject matters will answer various questions (pertains to 2.a through 2.c above) and a separate questionnaire specifically to answer 2.d to test which current mobile phone models are best equipped with available Wi-Fi or Internet and software capability in order to make QR technology useful. Both methods will be detailed later in this chapter.
4. Identification of the target population and determination of any necessary sampling procedure. As my research is on technology that relies its growth on mobile “smart” phones much like the Internet does with the personal computer, it is flawed from the beginning in that it relies on the pretense that all participants or subject matters of the study have a mobile or cellular phone. However, by filtering that information first, I should be able to find out what kind of people look to using this technology:
 - a. Do they have a “smart” phone such as the Apple iPhone (iPod Touch also applicable since it would be considered a mobile-web device), Blackberry, or Palm Treo that can connect to the Internet?
 - b. If they do, do they rely on it, and specifically for what features?
 - c. Would QR technology enhance their experience in using such features such as automated web-browser pointers and quick access to phone-book registration, and would it influence their purchasing powers or patterns?
5. Collection of date, analysis of data, and report preparation. Although this step has not been completed yet, I plan to do this in two surveys. One is to find out more about where the general population stands in regards to using “smart” phone technology, and more specifically, is the general American public ready for QR technology? The following survey questionnaire will be administered to students and faculty participants at Cal Poly and local occupants of San Luis Obispo, California to gather consumer perspective on accessing information about products on mobile web-enabled devices such as a smart phone or Apple iPod Touch. The students represent the demographic range of young American adults age 18 to 25, and faculty or staff will represent the general market consumer that fit anywhere between age 26 and up:

3. A. Questionnaire to sample population

1. What is your gender?
 - a. Male
 - b. Female

2. What is your major? If you are not a student, please describe your occupation.
3. Please check the age group you identify with:
 - a. 15-19
 - b. 20-24
 - c. 25-29
 - d. 30-39
 - e. 40-49
 - f. 50+
4. Do you own a mobile device (including iPod Touch) or cellular phone?
 - a. Yes—Please describe model and service:
 - b. No
5. On a daily basis, how often do you use your cellular /mobile phone?
 - a. Frequently (at least once every hour)
 - b. Often (every 2-3 hours)
 - c. Occasionally (every 4-6 hours)
 - d. Seldom (once a day)
 - e. Never (I use it only for emergency purposes)
6. Which of the following features of your cellular/mobile device do you use the most? (Please rank based on your usage frequency)
 - a. To receive / make calls
 - b. Texting / Instant Messaging
 - c. Email
 - d. Internet browsing
 - e. As a digital day planner / organizer (i.e., Palm Pilot)
 - f. To play games
7. If you do subscribe to a data package that allows Internet / Wi-Fi capability, how often do you use this technology?
 - a. Frequently (At least once every 2-3 hours)
 - b. Often (At least once a day)
 - c. Occasionally (Once every 2-3 days)
 - d. Seldom (Once a week)

- e. Hardly ever (Once a month or only when I want to download a ring tone)
 - f. Never / Do not have an Internet-enabled cell phone plan
8. In the last 6 months, have you used your texting capability on your mobile device for services other than contacting people? (Voting for candidates on TV programs such as American Idol, Dancing with the Stars, etc., or getting more information on advertisements or updates)
- a. Yes
 - b. No
 - c. If yes, please explain:
9. If you were able to scan information by some means into your mobile device, which of the following printed materials would you see yourself most interested in using this information off of (example uses are in parenthesis)? Please rank based on how you think you would use most frequently.
- a. Business cards (automatic phonebook registration)
 - b. Newspapers (saving articles to read on the go, advertisement information)
 - c. Magazines (saving recipes from cooking magazine articles, entering sweepstakes or contests, scanning in coupon codes that can be used for online purchasing)
 - d. Advertising flyers (More information on event or product advertised, ticket box office contact info access for shows or concerts, special promotions)
 - e. Posters (Links to reviews for movies or shows, ticket sales/purchasing online, online or web site access for more information)
 - f. Direct Mail (scanning and saving information such as bank statements, billing invoices, registration records)
 - g. Mail-order catalogs
 - h. Internet web site (downloading ring tones onto mobile device from monitor screen, quick-downloading of games or puzzles, news articles, etc.)
 - i. Consumer or product packaging (sweepstake/contest entering, researching nutritional information, easy phone number access to customer service or inquiry hotline)
 - j. Other (please describe)

Another survey that I am considering incorporating is specifically to those who do have smart phones that are capable or compatible with QR technology. The extent of usage and reliance on Internet capability will vary within the population, but even without Internet capability, if the mobile device or phone itself is

capable of scanning the QR code, a survey based on its usability should provide useful information on how interested the consumer base is about using the technology.

3. B. Survey based on QR technology

The following survey relies on three points: a) if the study participant / subject has a mobile device capable of QR Technology (the Apple iPod Touch, iPhone (2G or newer), Blackberry Storm, Palm Treo series (650P or newer), newer Nokia “smart” phones, and few other models have available third party applications or downloadable software that can enable the phone to read the 2D barcodes), b) if the subject has the software installed, and c) if the phone has memory space. The survey will include an activity in which



Graphic Communication students that own smart phones will be requested to participate in a 10 minute exercise that will involve downloading a QR-code reader software for their mobile device (available at <http://reader.kaywa.com>) and scanning the following image that will give them one of the following:

- A. A phone number
- B. A message
- C. A pointer address on the Internet that will allow access to a web site

The participant will be asked to comment on how quickly they were able to get the information, how useful they believe this technology will be to them, in addition to answering the last question of the other survey question (which printed material they see themselves using QR technology in conjunction with), in order to complete the study data.

Levenson also quotes Communication Researcher Bernard Berelson: “Content Analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of Communication.” Levenson defines that the objective of the study means that the categories used to analyze content must be defined so precisely that different people can analyze the same content using these definitions and get the same results. Systematic meaning that the selection of the content to analyze information must be on a formal, predetermined and unbiased plan. Quantitative meaning the results of the analysis expressed numerically, and manifest meaning that the systematic analysis involved in content analysis is fairly direct and simple kind.

Content Analysis interpret evidence available for understanding the past and present. In this study, literature search presents background leading up to present usage and concerns of QR code and cell phone technology in Japanese society. The survey results will help predict if American consumers are willing to use mobile device technology and if it would have an effect their purchasing decisions. Content analysis will incorporate all research data gathered from this project and analyze how viable QR coding technology will be to an American consumer market. Content analysis is a method of quantifying and building statistic figures based on the qualitative information gathered from the survey questions and the descriptive research.

Chapter IV: Results

The result of this research was designed mainly to answer the two questions noted previously in this report: “To what extent is current America reliant on ubiquitous mobile technology?” and “How likely it is that QR code implementation would be a success for marketing in America?” In this chapter, the statistical data gathered from a questionnaire survey and data collection based on GossRSVP technology is also included.

Part A: From Questionnaire Survey

The subject participants were mostly Cal Poly students, graduates, alumni, faculty, and others participating in this study were from various background fields in the workforce. Out of the 149 total questionnaire responses collected, 65 (43.92%) were either Graphic Communication majors currently in school, recently graduated, in the printing or Graphic Arts field as a plant manager, production manager, production artist, or a graphic designer. Forty other respondents (27.03%) were from Engineering or Math and Science background related fields of studies or professions.

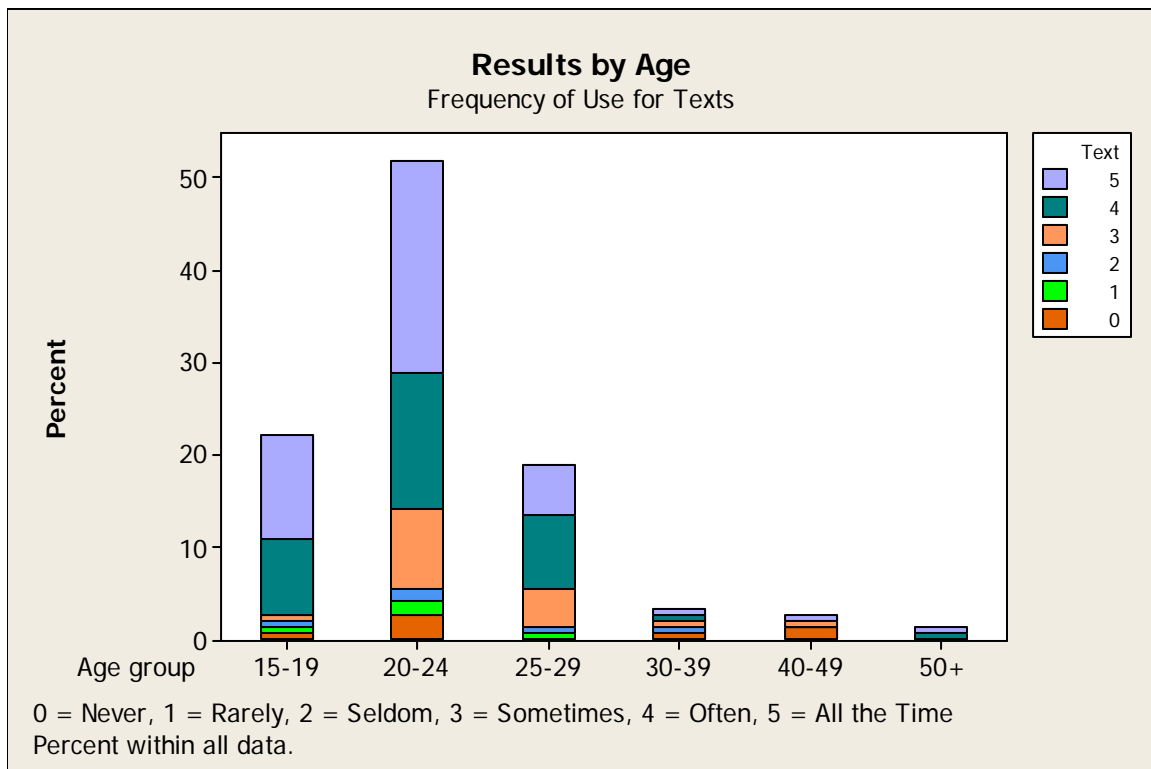


Figure 2: result of text usage response, by Age Groups

From the research question, its starting point was to find out how much of the American public currently use ubiquitous mobile technology. Although three respondents did answer “no, I do not have/own a mobile phone,” those three have also completed the survey and answered questions on whether they used their cell/mobile phones for either calling or sending SMS texts, so it stands as proof that most everybody owns some form of ubiquitous mobile device. The above figure shows the results of distribution of how frequently each age group uses SMS functions of their phones. The stacked bar graph shows what percentage of each age group uses in what frequency. For example, the top twenty percent of the bar graph for age group 20 to 24 year olds note that 20% of this sample populous admit that they use SMS or texting “all the time,” or most frequently.

Phone usage can vary depending on user to user, so in order to set a clear visual of how phone usage was distributed amongst users, they were categorically divided into two groups: the “Data-Package Subscribers” who have Internet or Wi-Fi capability on their phone included with their provider service, and the “Non-Subscribers” who do not pay for this service or may have it but claim to “never use it.” The following table shows response rates of counts—people who actually scored a usage value of 1 to 5 based on how frequently they used their mobile phones for the function); Total value—a tally sum of the total score projected; and the average scores—the “rating” in which “functional utility” of that specific function of a cell phone is weighted on average by the user group. Table 1 on the following page shows responses broken down by following:

1. Calls
2. Text / SMS or Instant Messaging
3. E-mail
4. Web or Internet Browsing
5. Twitter or Facebook status updates
6. Daily planner or Organizer
7. Games

The whole group in general, then the Data Subscribers, and lastly the Non-Subscriber group divide the tables, so that it is easier to view. The key thing to note here is the “Average Scores,” which will show how *value* of the utility function is weighted for the user in the group. Overall results show that most responses from either groups are consistent except for E-mail and Web Browsing, which is likely either not available at all for the users in the Non-Subscriber group or very expensive to the point it is not worthwhile for the user. The scores were based on 1 being “Rarely or Hardly ever use” to 5 being “most frequently use” (see Appendix A for reference).

Table 1: Current most popular uses of cell phone

All User Responses	Calls	Text/IM	Email	Web Browsing	Twitter/FB	Organizer	Games
Count Replies:	148	141	45	49	47	81	71
Total Value:	555	582	160	160	149	205	144
Average Scores:	3.750	4.128	3.556	3.265	3.170	2.531	2.028

Data Subscribers	Calls	Text/IM	Email	Web Browsing	Twitter/FB	Organizer	Games
Count Replies:	56	54	42	47	39	41	42
Total Value:	215	228	156	158	124	117	97
Average Scores:	3.839	4.222	3.714	3.362	3.179	2.854	2.310

Non-data users	Calls	Text/IM	Email	Web Browsing	Twitter/FB	Organizer	Games
Count Replies:	92	87	3	2	8	40	29
Total Value:	340	354	4	2	25	88	47
Average Scores:	3.696	4.069	1.333	1.000	3.125	2.200	1.621

Not surprisingly, text messaging is by far the most popular application amongst all users. Here we have the overall responses from everybody, then broken down into categories based on if they answered another question pertaining if they subscribed to a data package with their cell phone plan or not. Some may have it but never use it; those are also grouped into the “non-data user” category for this observation.

Of all the 21 people who answered that they have used text messaging to do something other than contacting people (i.e., text Twitter to update, vote for television show participants, check the weather, etc.), 13 of them (61.905%) claim they either never use their data package or not have one at all. Out of the 66

AT&T subscribers, 13 (19.697%) have used text SMS as part of a promotion code or information exchange with an interactive source within the last 6 months.

Now the question of interest becomes the future: “How likely is it that these users are going to use QR barcodes or GossRSVP™ codes in the future, and how useful do they feel about it now?” In the following tables 2-4, each group of Data Subscribers, Non-Data Subscribers, and the total group together were counted based on the scoring used similarly before. Each column represents a print media that the survey respondents believed they would use and the ratings are tallied and averaged out accordingly. To make it easier to see, each of the top three scores in “Total Value” and “Average Scores” have been highlighted yellow to see what medium of print users have responded as most useful. Scores of the 56 whom claim they currently use a data plan (implication that they currently have means of accessing the Internet on their cell phones) are represented in the following:

Table 2: Utility score by Data Subscribers for interactive barcodes

Print Medium:	Business Cards	Newspapers	Magazines	Ad/Flyers	Posters
count replies	52	47	50	48	48
Total Value	148	118	141	124	119
average scores	2.846	2.511	2.820	2.583	2.479

Print Medium:	Direct Mail	Catalogs	Internet	Packaging
count replies	43	43	50	42
Total Value	113	79	152	115
average scores	2.628	1.837	3.040	2.738

Everyone else in the Non-Subscriber category that replied “Never use my data plan” or “Do not subscribe to a data plan” replied as following table shows. Interestingly, the total value of each category remained the

same as the Data-Subscribers; however the average score was slightly different. Data scanned into phones from Newspapers were valued slightly higher in this group.

Table 3: Utility scores by Non-Data Subscribers for interactive barcodes

Print Medium:	Business Cards	Newspapers	Magazines	Ad/Flyers	Posters
count replies	72	62	64	65	66
Total Value	171	150	168	151	159
average scores	2.375	2.419	2.625	2.323	2.409

Print Medium:	Direct Mail	Catalogs	Internet	Packaging
count replies	59	40	72	56
Total Value	137	65	197	121
average scores	2.322	1.625	2.736	2.161

Now the total group variance is taken into account and has been calculated the same way. The majority of the results show the same weight and value implicated by the scoring system as the “Data-Subscribers” group. The Business Card category gathered the most responses—124 out of 149—however, it is subject to speculation that perhaps people do not see the value in being able to automatically scan in a contact information from just taking a picture of a barcode on a business card rather than typing the information in. Another interesting factor to note is that Magazines are still quite popular within the general masses according to this study. Although slightly lower than the users in the “Data-Subscribing” group, a general observance can be made that these print media categories that score above average (based on this research, a score of over 2.5 should be noted as “above average”) may have some potential for growth with the help of QR codes, GossRSVP, or by other means of ubiquitous mobile communication technology. The following table is a summary of the overall responses:

Table 4: Utility scores by all users for interactive barcodes

Print Medium:	Business Cards	Newspapers	Magazines	Ad/Flyers	Posters
count replies	124	109	114	113	114
Total Value	319	268	309	275	278
average scores	2.573	2.459	2.711	2.434	2.439

Print Medium:	Direct Mail	Catalogs	Internet	Packaging
count replies	102	83	122	98
Total Value	250	144	349	236
average scores	2.451	1.735	2.861	2.408

Just for fun, this author decided to see what the group who admitted to “Frequently” make use of their Internet/Wi-Fi capability on their phone thought about interactive print, and what they valued as useful for interactive barcodes. The hypothesis was built on the basis that some of these users may have already had exposure to such marketing and would have geared towards business cards and the Internet just as well as the general group, but also perhaps in Packaging. Out of the 22 whom responded that they “Frequently” use their data package plan, 9 of them (roughly 40.91%) are older than 25 years old and working in fields where constant communication or use of cell phones may be necessary. This author’s guess was that these would be the trend-setters who would take on the introductory curve of a product life cycle and help create the new wave of “trends” in the new technological era. After having recorded and analyzed the data, what was interesting was that this group of data-exchange Internet “Frequent Mileage Club” had a different response from the overall general sample:

Table 5: Utility scores by just the users who "Frequently" use their data package

Print Medium:	Business Cards	Newspapers	Magazines	Ad/Flyers	Posters
count replies	22	22	22	20	22
Total Value	69	60	63	55	54
average scores	3.136	2.727	2.864	2.750	2.455

Print Medium:	Direct Mail	Catalogs	Internet	Packaging
count replies	21	18	22	18
Total Value	67	35	72	50
average scores	3.190	1.944	3.273	2.778

Although “Internet” and “Business Cards” predictably continue to be the highest scoring in terms of points, how valuable the information is seems to shift with these people. Surprisingly, these users also said “Direct Mail” has an importance to them that they would want the information to be scan-able to their mobile devices. It must also be noted that these whom claim they use their data package “Frequently” also tended to rank higher on the usability score across the board than that of the average users.

Part B: GossRSVP™ and Cal Poly’s Response Rate

In an effort to measure how responsive to interactive print the general populous of Cal Poly could be, this project involved the Mustang Daily to print an ad promoting “chance to win a free cup of coffee by responding to this ad!” with simple instructions to text the GossRSVP-generated code or to scan the barcode given. The barcode was coded to automatically generate a SMS text to the GossRSVP number. To differentiate which type of technology had better response rates, two promotional codes were used on the same ad—one for the text code, and one for the barcode image. In order to ensure anonymity, the ad noted that the winner would be “picked randomly” and that they would be notified in the event the user/respondent had indeed won the promotion.

NEED A LIFT?



Tired of studying?
Need something to
brighten up your day?

Scan the barcode
on the left or **TEXT
7TP7RA7 to 64842**
for a chance to win
a **FREE CUP OF
COFFEE.**

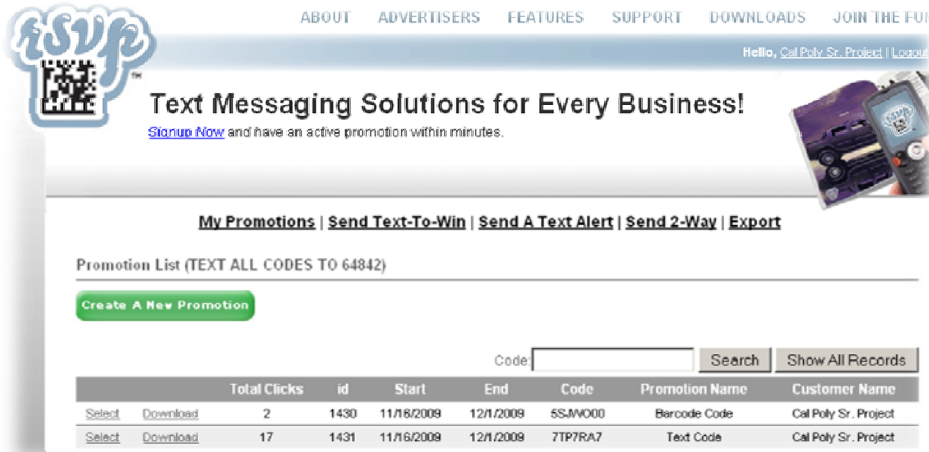
*Limited Time offer. One per person. Winner will be selected at random.
Coffee brand/type would be winner's choice up to \$3 in value.

Figure 3: Mustang Daily Ad Copy

Wednesday, November 18th to Tuesday, November 24th, 2009. Due to the nature of the school schedule being right before Thanksgiving Holiday, timing-wise it may have not been the best to test this theory.

As shown in above figure, the response rates for the Barcode promotion were abysmal. The text code

On GossRSVP website, it is extremely easy to set up the promotions and how one should pre-set the promotional winning rates. For this experiment, the winner was based on every 20 respondents for the text message code and every 5 respondents for the barcode, since it was suspected that not too many students would respond. The Mustang Daily printed the ad shown on the left; 6,000 copies of their on-campus daily newspaper for 4 days from



The screenshot shows the GossRSVP website interface. At the top, there is a navigation menu with links for ABOUT, ADVERTISERS, FEATURES, SUPPORT, DOWNLOADS, and JOIN THE FUN. A user is logged in as 'Hello, Cal Poly Sr. Project'. The main heading is 'Text Messaging Solutions for Every Business!' with a 'Signup Now' link. Below this, there are links for 'My Promotions', 'Send Text-To-Win', 'Send A Text Alert', 'Send 2-Way', and 'Export'. A section titled 'Promotion List (TEXT ALL CODES TO 64842)' contains a table with columns for Total Clicks, id, Start, End, Code, Promotion Name, and Customer Name. Two rows of data are visible in the table.

	Total Clicks	id	Start	End	Code	Promotion Name	Customer Name
Select Download	2	1430	11/18/2009	12/1/2009	5S4W000	Barcode Code	Cal Poly Sr. Project
Select Download	17	1431	11/16/2009	12/1/2009	7TP7RA7	Text Code	Cal Poly Sr. Project

Figure 4: Screenshot of GossRSVP code set-up page

worked quite well, however, and it is this author's guess that had it not been the week before a big academic holiday, it may have experienced a better response rate. However, it does show promise for GossRSVP and other two-dimensional barcodes as well as for cell phone software developers that this type of technology will continue to grow in the future.

Chapter V—Conclusions

Although the experiment with Cal Poly's response rate in the Mustang Daily was quite disappointing, this author has hope that it would not be too long before QR codes and other ubiquitous barcode marketing programs like GossRSVP and other two-dimensional barcodes will connect the future of interactive print. The current evaluation regarding either technology is that while most people are on a mobile phone plan that allows for text messaging, the premise for hesitation is that the technology is not yet ubiquitous enough, or the cell phones that are currently in circulation are not capable of the barcodes just yet.

On the note of cell phone technology not being up to date, Roger Belanger, Director at GossRSVP, LLD., has the following insight to share:

"The problem with current status of either of these mobile-tagging technologies is that the turn-around rate for cell-phones is typically slow for the United States. Then we start running into problems for promotional codes like this where we know the technology is capable, but the means for our target audience is not quite there yet. And so then you get into a tight spot with the hardware not working and things of that nature. What's great about [GossRSVP] is that almost anyone has the ability to text an SMS easily and readily, and so our advantage is that we support the needs of our customer from both ends. We can provide the data our client uses to market their promotion or product through UpCode's system, and it does not necessarily have to be based on the level of complexity that the consumer or end-user has."¹²

Looking back on the ratings for uses on print media (see Tables 3-5), it was apparent that current interest for future development of interactive print using cell phones is quite low for the average cell phone user who does not have a data packaged plan. However, the growing market potential is there, given that those whom did respond to the question pertaining to interactive print did respond with an average rating of around 2.5 score or above.

The age of ubiquitous computing and communication is right around the corner. It is now up to the printing market to take advantage of an opportunity to flourish with the right connections. In order for ubiquitous marketing to take place using something that the end-user customer already has in their hands, a

¹² Belanger, Interview by author, 04November2009.

significant amount of value must be created from the provider's side. A business card has no value when it gets lost in a packed wallet and one cannot search or refer to it easily when it needs to be access. A poster cannot have too much information, but just enough interesting elements for a moviegoer to want to see it. A cookbook is cumbersome and not an easy tool to take if one wants to go shopping with it based on the ingredients needed. That is where a simple barcode can come in handy. What if, automatic phone-book registration onto a cell phone with anyone's contact info was just as easy as pressing one button, instead of typing out all that information? What if, it was possible to automatically record the premier night of the next movie onto the calendar of a cell phone, not to mention save the poster picture as wallpaper on the phone as an added bonus? What if a single-mom with two jobs can take one look at an article out of a cooking magazine, scan the recipe into her phone while it automatically generates a shopping list of ingredients for her? What if the following pages were coupon ads that can also be scanned in and redeemed at the supermarket, which just so happens to be the ingredients she needs to make dinner? Wherever a traditional organizer notebook can come in handy, this technology would have opportunity to flourish.

The purpose of ubiquitous barcode technology is to eliminate the time it would take to record and type in information. With phones continuously getting smaller and compact, it becomes increasingly harder to type in arduous information in a small touch-sensitive screen or on a tiny keyboard. True, one can write information down. However, a business solution is about providing those services before a customer realizes they need something. From this study, if it were to be concluded that barcode techniques for marketing were definitely in need, then this report would have been started few years too late and doing the research now would have been a mute point. Because there *is* currently a certain level of uncertainty but also an undeniable level of interest in the *values* this technology can add to traditional print media, ubiquitous marketing using cell phones will likely be successful in the very near future. As the cell phone technology gets easier to advance with less expensive and more capable models coming out each year, it is hard not to imagine that eventually the market competition for wireless phone providers is the price of service. When the cell phone market gets to the point of saturation that everyone owns a cell phone and the only way for wireless providers to compete is in the price of their services, it may be possible for the monthly fees and data packages to come down in price. When that occurs, there would be an enormous opportunity for the print market to take advantage of the new and cheaper interactive tool that has been sitting right there in the palm of their target audiences' hands.

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Appendix A—Survey Monkey Questionnaire

A. Who are you?

Thank you for participating in Yumi's senior project survey. This should only take a couple minutes of your time, and I appreciate your cooperation.

Please answer the following demographic questions.

1. What is your gender?
 - a. Male
 - b. Female
2. What is your major or field of study? If you are not a student, please describe your occupation.
3. Please pick the age group you identify with:
 - a. 15-19
 - b. 20-24
 - c. 25-29
 - d. 30-39
 - e. 40-49
 - f. 50+

B. Ubiquitous?

This page is to gather information about how you value your cell/mobile phone.

4. Do you own a mobile device (including iPod Touch) or a cellular phone?
 - a. Yes: Describe Cell Phone Model & Service Network (e.g., Palm Treo / AT&T)
 - b. No
5. On a daily basis, how often do you use your cellular or mobile phone (for calls or otherwise)?
 - a. Frequently (at least once every hour)
 - b. Often (every 2-3 hours)
 - c. Occasionally (every 4-6 hours)

- d. Seldom (once a day)
 - e. Never (I use it only for emergency purposes or do not own a mobile phone)
6. Which of the following features of your cellular/mobile device do you use the most? Please rate the use of each feature based on your usage frequency.
- a. Frequency Ratings (value noted in numbers in parenthesis):
 - i. Never (0)
 - ii. Rarely (1)
 - iii. Seldom (2)
 - iv. Sometimes (3)
 - v. Often (4)
 - vi. All the time (5)
 - b. Categories:
 - i. To receive/make calls
 - ii. Texting/Instant Messaging
 - iii. E-mail
 - iv. Internet Browsing
 - v. Twitter/Facebook updates
 - vi. As a digital day planner/organizer (i.e., Palm Pilot)
 - vii. Game device
 - viii. Other (Please specify)

C. Not just a phone...

These questions aim to measure what feature other than just a phone is valuable to you on a mobile device. Please answer to the best of your ability.

7. If you do subscribe to a data package that allows Internet or Wi-Fi capability, how often do you use this technology?
- a. Frequently (at least once every 2-3 hours)
 - b. Often (at least once a day)
 - c. Occasionally (once every 2-3 days)
 - d. Seldom (once a week)

- e. Hardly ever (once a month)
 - f. Never or I do not have Internet capability on my plan
8. In the last 6 months, have you used your texting capability on your mobile device for services other than contacting people? (For example, voting for candidates on TV programs such as Dancing with the Stars, American Idol, or getting more information on advertisements or updates)
- a. No
 - b. Yes: Please describe for what
9. If you were able to scan information off of a printed source by some means into your mobile device, which of these would you see yourself using the most? Please rate each according to how often you think you would use this.
- a. Frequency Ratings (value noted in numbers in parenthesis):
 - i. Never (0)
 - ii. Rarely (1)
 - iii. Seldom (2)
 - iv. Occasionally (3)
 - v. Sometimes (4)
 - vi. Frequently (5)
 - b. Categories:
 - i. Business cards (automatic phone-book registration / scan-and-call)
 - ii. Newspapers (saving articles to read on the go, advertisement information, downloading the daily puzzle/game, saving a coupon code)
 - iii. Magazines (saving recipes from cooking magazine articles, entering sweepstakes or contests, scanning in coupon codes)
 - iv. Advertising flyers (More information on event or product advertised, ticket box office or contact info for shows or concerts, special promotions)
 - v. Posters (Links to reviews for movies or shows, ticket sales/purchasing online, online or web site access for more information)
 - vi. Direct Mail (Scanning and saving information such as bank statements, billing invoices, registration records)
 - vii. Mail Order Catalogs

- viii. Internet web site (downloading ring-tones, games, news articles, saving information from your monitor screen to take on the go)
- ix. Consumer or product packaging (sweepstake/contest entering, researching nutritional information, easy phone number access to customer service or inquiry hotline, web search for price comparison)

Appendix B—Interview with Roger Belanger

(Outline of questions asked)

1. What is the key technology behind GossRSVP -- what are some of the advantages over the QR code, where there are already dozens of free reader software and code generators available online?
2. From what I understand, the code generation of the GossRSVP is for a fee, why did you choose to go this route, where similar barcodes like the QR Code you can generate quite easily online?
3. What market advantage does RSVP have over similar Ubiquitous/mobile technology marketing techniques.
4. The QR code has taken off and has been a mainstream marketing niche for a while in Japan, and now infiltrating Asia and Europe at a rapid rate--why is it so hard for it to catch on here in America? (I'm looking for a more personal opinion from Roger)
5. In my research I found a similar service called i-nigma by 3GVision that is entirely the same concept of GossRSVP only with usage of both QR Codes and Data-matrix barcodes. How does GossRSVP differentiate itself from something like that has already been proven effective in other countries and what advantage does the GossRSVP have to offer in the marketing industry?

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