

**Trust-Based Marketing on the Internet:  
Design and Implementation of Algorithms for a GM Customer  
Advocacy Site**

by

Stephen Kao

Submitted to the Department of Electrical Engineering and Computer Science  
in Partial Fulfillment of the Requirements for the Degrees of  
Bachelor of Science in Electrical [Computer] Science and Engineering  
and Master of Engineering in Electrical Engineering and Computer Science  
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May 19, 2005

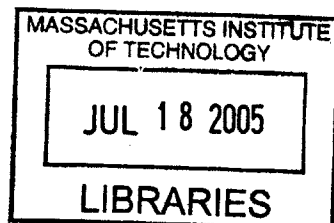
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**BARKER**

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**Abstract**

The future of marketing will be shaped by the Internet. Typical push-based marketing techniques have decreased in effectiveness due to the amount of information available on the Internet. In order to survive in the future, companies will need to adapt trust-based marketing techniques in order to survive on the Internet. The E-business group at MIT Sloan under the guidance of Prof. Urban is working on a website that applies trust techniques for GM. Automobile manufacturers, GM among them, have suffered from low trust levels from consumers. The purpose of this project is to determine whether certain trust factors in a website improve consideration and trust in GM. A large part of the website My Auto Advocate involves using advanced computer science algorithms and techniques in building the trust-based site. This thesis concentrates on what computer science problems are presented by building a trust-based site and how these problems are solved and implemented.

Thesis Supervisor: Glen L. Urban

Title: David Austin Professor Of Marketing, MIT Sloan School of Management

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## Chapter 1 Introduction

The growing popularity of the Internet has revolutionized the way products are marketed.

The Internet has become a tool that has empowered the consumer with information.

Retailers have lost much of their information edge to consumers who use the Internet effectively. Consumers can now find competing prices, problems with products, user reviews, and a whole host of additional information that was once hard to get.

The Internet has made numerous traditional methods (push-based methods) lose their efficacy. Push-based methods revolve around selling a product by focusing exclusively on all the positives of the product while hiding any damaging information. Marketers take advantage of an information edge that they have on consumers. However, the Internet has made this method less effective because the information edge has been reduced by the Internet. Consumers can easily find price comparisons and problems with products. In fact, consumer trust in a brand may go down when an advertisement hides negative information that is subsequently found on the Internet.

Hence, there has been a need for trust-based marketing via the Internet. Using the Internet as a medium to spread information, the company displays complete and honest content for the consumer. Once a trust relationship has been built, the retailer can then push its product in an honest manner to a more receptive consumer.

General Motors partnered with MIT's Prof. Glen Urban and the e-business at Sloan group to find ways to market GM products in an advocacy-based manner. Through many years

of research, the project has culminated this academic year (2004-2005) on a large scale survey to determine which trust methods work in improving trust and consideration in GM and its products.

This paper discusses the background of trust-based marketing and how the My Auto Advocate project came to fruition. Next, it explores the various design strategies used to build trust-based site for automobiles. Next, this paper presents the algorithms and systems designs behind building this fully functional web site. It goes into detail on specific problems presented in building a survey-based research site involving rewards system and on solutions to these problems. Finally, this paper reflects upon the solutions and discusses improvements for future endeavors including a scaled-up version of My Auto Advocate.

## ***Objectives***

This paper will go over the following objectives that were attempted and accomplished in this project. First, this paper will describe the creation of a novel market research project on trust-based web site. It will thoroughly study trust-based marketing and how it was applied in this project. Secondly, this paper will describe the creation of the database system that successfully tracks and records user data for purposes of running a trust-based site and analyzing of user data for research purposes. Third, it discusses the reward system implementation. This paper will look into how the rewards system is implemented and focus heavily on the problems/solutions of working on the rewards

system so that future generations can learn from mistakes made and solutions wrought during this project.

## Chapter 2 Background

With the growing popularity of the Internet, consumers nowadays can easily access the product information needed to compare all available options that best suit their demands. With the spread of e-commerce, consumers no longer need to rely on local stores and agencies to provide for their needs. The simplified transactions that the Internet enabled have made it easy for consumers to switch between different vendors or service providers regardless of their physical locations [2]. All these factors are leading to an empowered consumer who has gained an edge on marketers.

With this shift in power, businesses have felt the pressure to switch to other methods to draw new customers and keep existing customers loyal. One such method is trust-based marketing. An emerging theory, trust-based marketing is a concept that has been championed by Prof. Glen Urban of the Sloan School of Management at MIT. He believes that consumers will be drawn to companies that they trust. Furthermore, they will reward companies that are always open and complete with information by trusting information presented by the company.

This section looks into how marketing has changed as a result of the Internet, focusing heavily on trust based marketing. Next it discusses how the GM-MIT project is studying trust-based marketing. Finally, it discusses the individual trust components that were implemented in the My Auto Advocate web site.



## **Trust**

“Trust is the key in an advocacy strategy.” [2] The trust dimension, a concept by Prof. Urban, presents different levels of trust customers have in a business. Depending on the level of trust in a company, consumers will have different attitudes towards a company. The purpose of any trust-based marketing campaign is to develop the right level of trust to keep customers and bring in new ones. As Urban preaches, the key to marketing in an era of consumer power is to be open and honest to inspire trust with the consumer. This concept has not always been prevalent, even in today’s marketing campaigns, but the future may find the majority of companies turning to this strategy. This section discusses how trust has changed in the different phases of marketing: past, present and future.

### **Past: Push-Based Marketing**

Pure push marketing practice, which involves virtually no trust, exists at one extreme of the trust dimension. Push based marketing is an aggressive promotion of a product. The advertisement is one sided and tends to use limited information (deception) and tricks to draw users to a product. In a push based business model, a company benefits in the short run by taking advantage of the imbalance of information and capitalizing on consumers that are not yet fully informed about the product features and services. The goal is to get as many sales as possible, especially sales of high-margin items, through the use of flashy media advertising, aggressive promotions, and one-sided communication that may mislead customers. [2]

Because companies are faster than consumers at responding to new forms of information, companies in the past have always had an edge. Hence, push-based marketing has been the core of marketing techniques for the past 50 years.

### **Present: An Assault on Traditional Push-Based Methods**

The Internet has changed the imbalance of information between consumers and marketers. Companies cannot assume that consumers lack knowledge on certain product features and services. Because of this, push-based marketing techniques have started to flop. Companies who mislead consumers suffer significant loss of trust and this effect is long term and extremely detrimental. Any short-term sales gain that companies earn from a push-based marketing campaign cannot make up for the loss in future sales.

Companies have started to realize that they need to build a partnership with the consumer. This technique is known as relationship marketing. Backed by Customer Relationship Management and one-to-one marketing concepts, a partial trust-based company targets consumers better and are more efficient in delivering persuasive information and personalized promotions. In this manner, marketing techniques revolve around informing and building a partnership with consumers. Companies have started to move away from assuming that the consumer knows nothing and must be “pushed” a product. Moving along the trust spectrum, they have moved towards higher trust and increased advocacy.

In today's marketing campaigns, Customer Relationship Management strategies are just emerging. In the next few years, however, this strategy will grow increasingly popular to accommodate the empowered consumer. Although push-based marketing techniques will continue to dominate for the next few years, the Internet will slowly set in motion a strong migration towards trust building.

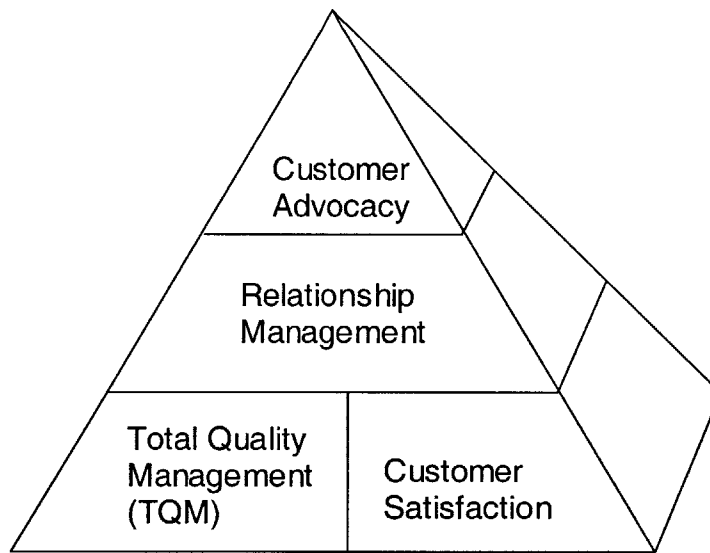
### **Future: A Move towards Trust-Based Marketing**

Recent marketing techniques that revolve around Customer Relationship Management is a result of the new consumer: one who feels he or she is knowledgeable enough to make the right purchasing decision with the right information. But eventually, relationship marketing will lose its effectiveness due to the ever continuing shift in consumer power. "People are more educated and informed than ever, and they have the tools to verify a company's claims and seek out superior alternatives from competitors." [3]

Consumer advocacy, a full trust-based strategy, exists at the opposite end of the trust dimension from the traditional push based marketing strategy. A full trust-based business aims to build long lasting relationships with its customers by truly representing the customers' interests. A company that adopts this strategy may then do something that puts a consumers interest (the cheapest product that satisfies its requirements) in from of the company's interest (having a consumer by its product). This may mean recommending a competitor's product. By doing this, the company builds a strong trust relationship with the consumer where the consumer can count on the company to look after its needs.

Consumer Advocacy is the epitome of a trust-based marketing which also encompasses building a relationship with a consumer and focusing on customer satisfaction.

Advocacy goes beyond being a trusted advisor to the consumer. An advocate goes out of the way to proactively represent the customer's interests. For example, the company will attempt to contact the necessary government agency if the customer has problems with another company. The GM project aims to eventually move the My Auto Advocate concept towards complete customer advocacy. Below is an advocacy pyramid which exemplifies these concepts. Note that the top of this pyramid is customer advocacy; advocacy can only work if all other parts of the pyramid are functioning smoothly.



**Figure 1: Customer Advocacy Pyramid**

## **The Effect on Automobile Manufacturers**

Automobile Manufacturers have been notorious for their push-based marketing techniques. From their ad campaign to their pressure sales approach at a car dealership, auto manufacturers do not have a high trust factor with consumers. General Motors is no exception. It spent more than 5 billion dollars last year on advertising. Much of their advertising campaign has focused on aggressively promoting their cars through glitzy, slick ads, one of the cornerstones of traditional push-based marketing.

Traditional push-based marketing ads are losing their effectiveness. Consumers have started to realize that educating themselves on automobiles is much more important than relying on a TV advertisement. The Internet has enabled this new reliance on information. Automobile specifications and competitive price comparisons are a large part of the information explosion on the Internet that has benefited consumers. Through sites such as Amazon and ePinions, consumers can find other consumer's opinions on makes and models. Through online pricing sites, consumers can find comparisons with other vehicles and also find out how much a model is selling for. Price incentives and other push-based marketing techniques cannot work as effectively because consumers can use the Internet to determine whether the final sticker price is actually competitive. Many other advantages that manufacturers have had in the past have also been diminished due to the Internet. Hence, manufacturers such as GM have needed to look to alternative methods to distinguish themselves from each other.

## ***GM Advocacy Project***

GM has worked with Prof. Urban and the E-business at Sloan group for many years. The past few years have produced the seeds for many of the novel marketing projects currently being employed by GM. These include the Auto Show in Motion experience and the Auto Choice Advisor website. However, GM as a whole still has a long way to go in terms of advocacy. The majority of GM marketing techniques still revolve around push-based marketing. Much of these techniques work well for a short time period and then quickly lose any positive impact that they had. As a rule, most of these techniques hurt the company and its image in the long run.

The goal for the joint project with MIT Sloan is to change the culture of push-based marketing. Most consumers are wise to many of the push-based marketing techniques. Moreover, many of GM's current techniques reinforce negative stereotypes on GM cars and further push down GM consideration.

## **GM's Need for an Advocacy Based Site**

This past fiscal year, GM announced a 5.45 billion dollar loss. This is a substantial loss that has lead many to challenge the leadership of GM. In addition, there has been a strong call for changing the way GM does its business. MIT's project fits in with these goals. This project is attempting to show the effectiveness of different trust-based techniques to encourage GM to change the way it does business.

Although GM has made strides towards building some level of trust with the customer, GM leadership still seems entrenched in old techniques. A common tactic used this past year by GM was to increase the MSRP while simultaneously offering huge discounts. While this tactic had a short positive impact on sales, the long run has been very negative as it only reinforced the idea that GM cars are cheaply made. In addition, consumers came to believe that GM cars were only worth what they were after the discounts. This hurts GM in multiple ways. In addition to losing trust in customers, it also hurts GM's ability to market vehicles at a reasonable MSRP.

Because of their past difficulties, an advocacy approach is strongly needed. GM needs to repair its image and inspire trust among car buyers. GM can do this by working on their Customer Relations Management. They need to work to build a relationship with the consumer from the beginning of the buying phase to throughout the ownership of a GM vehicle. GM has worked hard through the owner center (<https://www.mygmink.com>) to build the relationship with the consumer after the vehicle has been bought. They have used this project as an engine towards helping bridge the gap between consumer and GM during the buying experience.

### **Past MIT-GM Projects and Their Conclusions**

Auto Show in Motion (ASIM for short) evolved from the minds of forward thinking GM marketers. ASIM was created because of the lack of consideration of GM products by the general public. The perception of GM was very low and many car buyers would not even consider GM. GM felt, however, that they had improved their vehicles

considerably. Essentially, they felt that GM vehicles could compete with competitor's vehicles in their class. There just needed to be a venue at which customers could see this. Hence, the idea of the Auto Show in Motion came about. Customers can come to the free event and test drive GM vehicles right alongside competitor vehicles.

The GM-MIT team, seeing the success of GM's ASIM, decided it was also important to create an online counterpart for additional exposure. They felt that if GM cars were stacked up side by side with other vehicles that users would see the benefits of buying a GM vehicle. The creation of the Auto Choice Advisor (ACA) was the result of this idea. Users select preferences (price range, body types, attributes, etc.) and the ACA engine comes up with an unbiased list of vehicles that match their preferences. The GM-MIT team felt that this would improve consideration of GM vehicles as well as help users of the site trust GM more.

### **Dream CRM Project**

In the 2003-2004 academic school year, the GM-MIT team initiated a survey project to determine in a scaled-up site what trust factors actually improved trust and/or consideration in GM products. Among the factors considered were the Auto Show in Motion, Auto Choice Advisor, and a community of new car buyers. This survey involved a large number of Harris Panel members (semi-professional survey takers). Throughout the study, users were asked to go to treatments (such as ASIM) and then rate how they felt. The most important measurements involved trust for GM and



consideration of GM. Treatments including 360 Brochure<sup>1</sup>, ASIM, ACA, and the community all showed some promise and were deemed necessary for further exploration.

As a result, GM felt that they could scale up the project. After a presentation by Prof. Urban where he presented the team's findings, the marketing managers at GM decided that there was a lot of promise in using trust techniques instead of typical push-based methods. One of the first priorities was to build an online version of the Auto Show in Motion. The Auto Show in Motion showed one of the highest levels of improved consideration in GM. An online version that could replicate the experience, however much, would greatly cut down on cost (Auto Show in Motion is very expensive to run) as well as greatly increase the size of the potential audience (Auto Show in Motion only runs in major cities). Because of these benefits this was one of the highest priorities.

Surrounding this central idea of a virtual Auto Show in Motion was the need to build a site that encompassed all the trust concepts under one umbrella website. This site was named My Auto Advocate (MAA) and was worked on extensively throughout the academic school year (2004-2005). As a virtual auto show, users could access all the various trust treatments while immersed in an entertaining environment. In addition, users would have access to other important sources of information for their benefit. Additionally, the GM-MIT team felt it was important to determine whether incentives through Amazon certificates and lottery tickets towards a cash prize would further entice

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<sup>1</sup> The 360 Brochure was a physical brochure designed by Digitas. The brochure attempted to appear open and honest but still had a GM bias.

users to try the features of the site. Certificates valued between five and twenty dollars were attached to the various treatments.

## ***My Auto Advocate Components***

For My Auto Advocate, the GM-MIT created an overarching theme, the Virtual Auto Show, to showcase the multitude of components that would be accessible to users. The following section will describe the most relevant sections. It will discuss both the history behind the component and also why the component was a part of the final web site.

### **Opt-In Ads**

One of the biggest ideas of advocacy is non-pushy advertisement. As described in the background section, a tenet of advocacy is to develop trust with the customer and move away from the push based advertising. This became an issue for attracting users to the site. Since the majority of advertising strategies in use up to now are push based, the MyAutoAdvocate project needed to create a way to draw users to the site but still adhere to the trust style of the site. This is how the opt-in ads were created. With knowledge empowerment and trust as the themes, ads were set up in strategic car web sites. The ads stressed knowledge and tried to attract users by showing the incredible amount of information that they can obtain from the site. The ads assert that informed consumers make better purchase decisions and pulls at users' feelings to be smart consumers. This allows the users to be in a mind set of trust and knowledge seeking as they come to the MyAutoAdvocate site. Users already start off knowing that the MyAutoAdvocate site

there to help them and provide them with all the information they need to make smart vehicle buying choices.

## **Community – The Driver Forum**

A strong sense of community has always been regarded as a key ingredient in building trust. From the early stages of the MyAutoAdvocate site, it was felt that the site needed to build an easily accessible community to the users. The online forum is a website where users can come to view, contribute, or start new threads of discussion. My Auto Advocate's Driver Forum is an implementation of the online community with automobiles and related GM products as central themes. In addition, users discuss the MyAutoAdvocate site and interact with other users. In addition to gaining feedback on the site and on GM, the goals of the Driver Forum are to build a relationship with users and maintain a community that will bring back users. With this in mind, the Driver Forum is setup to create an environment where communication is safe, easy, and very fluid.

The Driver Forum was originally not part of any MIT research. An online community was first used as a focus group and as a way for GM to test out new ideas. GM had been using the community as a venue to get opinions on possible future endeavors on hybrid and hydrogen fuel cars. My Auto Advocate presented a great opportunity for the online community to expand into something more. The Driver Forum grew from a focus group and panel functions to serve as a gathering place for users to congregate and exchange opinions.

One of the attractive points of the Driver Forum is the lack of censorship on all materials that are discussed. Users are free to talk about any subject without the fear of GM suppressing the discussion. This is a very novel idea. Since My Auto Advocate is sponsored by GM, it would be reasonable for the makers of the site to remove any content that does not paint GM in the best light. However, this is not the case. Users are encouraged to express their views, however negative or positive of GM vehicles, without any fear of censorship. With no censorship, the Driver Forum puts an incredible amount of trust in the users. By showing such faith, users are much more likely to reflect this trust. Allowing negative comments on the Driver Forum has another added value as well. Even if negative comments can cause harm to GM's image, users know that comments on Communispace are sincere. When positive comments are made, these comments are much more likely to be believed. Users are generally cynical and distrustful of any positive contributions on the forums, because it can be perceived as pushy advertisements. Therefore, when a user makes a positive comment about GM cars, other users are much more likely to believe it.

Another advantage of using the Driver Forum is the forum's property of drawing users through self governance. At first, threads of discussion are moderated by Communispace, which runs the Driver Forum, but as time goes on control of the forum is handed over to active users. Self moderation expands upon the no censorship doctrine of the Driver Forum to truly give users the freedom to explore any topic. This freedom encourages discussion and allows users themselves to exercise discretion on the topics

and materials that are talked about. This way, a true sense of a trusting community is built using the free flow of information and peer to peer judgment of the appropriateness of the material as the foundations.

## **The Proving Grounds**

The Virtual Auto Show In Motion (VASIM) or GM Proving Grounds and the Virtual Auto Show (VAS) are the central premise of My Auto Advocate. Due to the success of the ASIM event, the objective of the Proving Grounds is to reproduce online the experience of attending an Auto Show In Motion (ASIM). The ASIM is tailored to people who are considering purchasing a vehicle, but are not the kind of people that usually attend auto shows. At the ASIM, visitors can take an up close look at different cars and can even get a chance to drive some of the vehicles. Extensive information is readily available, and attendees are encouraged to mingle with each other to offer advice and get first hand experience from other people.

The ASIM is particularly beneficial for GM. At the ASIM, attendees are exposed to not only GM vehicles but cars from all major car manufactures. The ASIM is a great event for showing the quality of GM cars that everyday consumers would not normally know about and this is the biggest reason to try to bring this experience to as many people as possible using the Internet. To recreate the experience of ASIM, users that go through the Proving Grounds should be exposed to all the things that the ASIM offers. At the ASIM event, users go through informational talks, take test drives, and listen to user testimonials. The hope of the Proving Grounds is to allow users to fully submerge in the

experience and appeal to the users' senses so strongly that users feel as if they are physically at the ASIM.

Everything on the Proving Grounds website is done to try to build the excitement and energy of the real ASIM event. The Proving Grounds puts users in the driver seat of a car through rich movies of live test drives and allows users to watch exciting user testimonials of ASIM attendees. Visitors of the Proving Grounds site receive all the information and benefits of attending the real ASIM.

### **The Virtual Auto Show (The Panorama)**

The success of the ASIM was also a big influence on the design of My Auto Advocate. Given the technologies at the time of implementation, Apple's Quicktime seemed appropriate. Quicktime allows developers to construct a moving 3-D image with built in hotspots, making it optimal as a navigation tool. Using novel scrolling techniques, users could "look around" a virtual auto show all within the Quicktime environment. Users then would be able to click on certain parts of the image to get further information on a specific topic. For example, users would click on the booth with the OnStar logo and would be redirect to the official OnStar web site.

However, implementation of the Virtual Auto Show was outsourced to a consultant how chose to use Macromedia Flash. Flash can create some of the same effects that Quicktime excels at, but user control of the auto show would be reduced. In the end, the

auto show became a detailed simulated environment that does create some of the feel of being in an auto show environment.

### **The New Vehicle Advisor**

The New Vehicle Advisor, also known as Auto Choice Advisor (ACA), and the car specifications page provide the majority of content for users. People who come to My Auto Advocate are usually interested in cars and most are considering buying a vehicle in the near future; therefore, car specifications and ACA are great tools for users to become familiar with different vehicles and find cars that are suited for them. ACA employs a large database that contains detailed information on vehicles on all major car manufactures.

The idea for ACA was based on a research project done at MIT from 1997 to 2000 call Trucktown. Trucktown was a research project that provided users with an online advisor that guided that guided them through the selection process of buying a new pickup truck. The success of the Trucktown project prompted GM to implement the project for all vehicles, hence the creation of the Auto Choice Advisor. ACA still retains the same advisory setup as Trucktown, but the scope is on a much bigger scale.

ACA starts with users answering a few questions regarding the background of the user, personal preferences, price range, and what the user is looking for in a car. Then, based upon the user's answers, ACA will provide the user with several cars that ACA believes are a good match. These matches are placed in a "virtual garage" so the user can do an

even more in-depth comparison of the results. The initial questions allow users to narrow down choices to a small number, and the “virtual garage” lets users do a through comparison to come to a concrete decision. The user then can use ACA’s extensive database to lookup more information or find dealers and vendors. Even though ACA is a GM funded research project, the results are completely unbiased and do not favor any model or car manufacture. The cars that are returned to the user are simply the best match for the user’s needs.

### **Car Specifications**

My Auto Advocate also offers detailed specifications on cars for almost all major brands and manufactures. Offering this kind of information has a very positive effect since all the visitors of the site show strong interest in cars, car specifications give the users a more in-depth look at cars and allow users to make much better comparisons. All kinds of information ranging from front row passenger space to engine torque are available users. The car specifications that are offered on My Auto Advocate are also presented in a similar fashion as ACA. No preference is given and only unbiased facts are presented to the users. This format of facts reporting creates an open environment that just reiterates the advocacy based theme of the site.

### **Research Link, Helpful Advice, and Advisors**

In addition to the already mentioned resources, My Auto Advocate also offers other information to visitors. There is a page of research links and helpful advice which offers



a myriad of sources for assistance on cars and car purchasing. Information vary from government agencies to affordable financing and insurance options. Users can go to this page to explore more about certain options and to be exposed to opportunities that may have not been considered. These helpful tips are there to support users in any car related questions and let the users know that My Auto Advocate is there to help them. In terms of advocacy, these research links are present to echo the belief that My Auto Advocate exists to solely benefit users.

## **Rewards**

The idea of rewards was first considered as a way to attract users to sign up for the Auto Show In Motion events. Since the event was a live event that needed a large number of people to be successful, the use of rewards would help to attract more people to consider going to the event. Users would be awarded a certain amount of points for signing up for ASIM, later; the users can redeem the points for Amazon coupons for chances to enter into a sweepstakes drawing. Using rewards was a great idea and help to contribute the larger turnout to the ASIM. The idea of rewards expanded as time went by. It was realized that it would be cost effective to offer rewards for all sections of the MyAutoAdvocate site. This made it so there would not be any misconceived conceptions of rewards, since before it was only offered to ASIM. Also, this gave people that would normally only concentrate on one part of the site more of an incentive to explore all the different parts and receive a more complete experience.

## **Chapter 3 Design of My Auto Advocate**

The visual goal of the My Auto Advocate website was to provide a comprehensive, immersive experience for new car buyers. In addition, the research goal was to determine which trust treatments were most effective for GM. To support these goals, the computer science component of this project involved designing a complete database design that captured all click streams of users in a meaningful manner. In addition, it was important to implement algorithms which would allow users to experience a secure site while providing incentives (monetary compensation) to encourage enough users to try the features of the site. Finally, it was important to use the captured data and manipulate it in a manner suitable for data analysis.

### ***Virtual Auto Show Theme***

With the design goals in mind, the most pressing matter initially was to come up with the user interface. This interface needed to follow the “Virtual Auto Show” theme. The overarching theme needed to revolve around a panorama of an auto show. Within the panorama, users could feel like they were immersed in an auto show and could “visit” different booths by clicking on them and finding out more. This basis allowed the designers to flesh out other parts of the web site. These included the welcome screen, the panorama, the lower navigation, and the help section.

## ***Navigation***

The navigation was simplified because My Auto Advocate was a test site. This meant that all content was tailored towards users already logged in. In addition, all pages except for the landing page could only be accessed by registered users who logged in. This meant that the first page seen by users must include easy access to the login page. However, in order to reorient first time users to the site, it was necessary to add a welcome screen that allowed users to explore the features of My Auto Advocate.

Once logged in, the panorama dominates a user's experience. Although two navigation menus were included for one click access to the features of the site, users were encouraged to use the panorama to get the My Auto Advocate experience. Users could pan left or right and search through all the "booths" to access the appropriate site.

The lower part of the page was reserved for content. When a user selected a certain feature, for example by clicking on the booth for the New Vehicle Advisor, the lower page would display the New Vehicle Advisor page. Users would then have the option of going to the third party site, in this case the Auto Choice Advisor website, in a new pop-up window. From there, they would have the option of exploring the website and/or returning to the My Auto Advocate site by closing the window.

## **Welcome Screen**

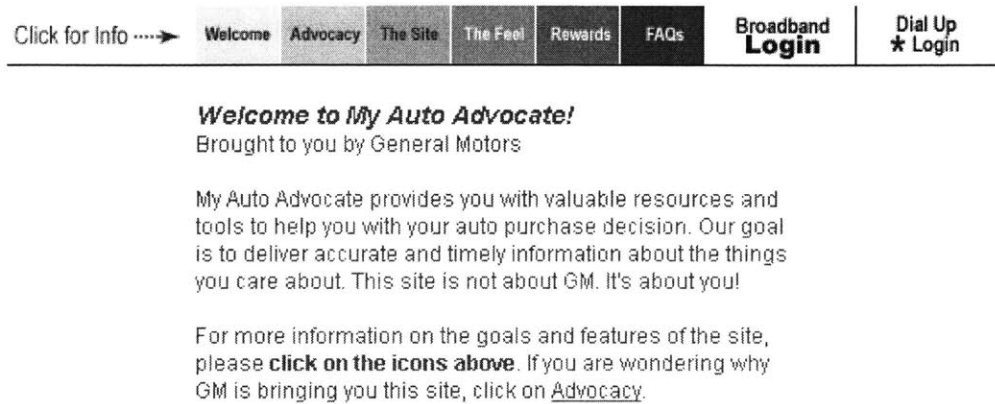
The welcome screen was important for two reasons. First, users may want additional information before registering/logging in. Second, users needed to choose whether to

view the broadband (multimedia heavy) version or the dialup version, hence necessitating the need for two logins. Having a welcome screen to display the two logins was important in creating a smooth interface.



**Figure 2 – My Auto Advocate’s welcome screen**

This image shows that the virtual auto show theme dominates the welcome page. Below this image is the precursor to the lower navigation system. In its place are a series of buttons that lead to content that participants can use to get a better feel for the site. They can learn about advocacy, the purpose of the site, how the site works (“the feel”), the rewards system, and general frequently asked questions. The image below shows the navigation process in work.

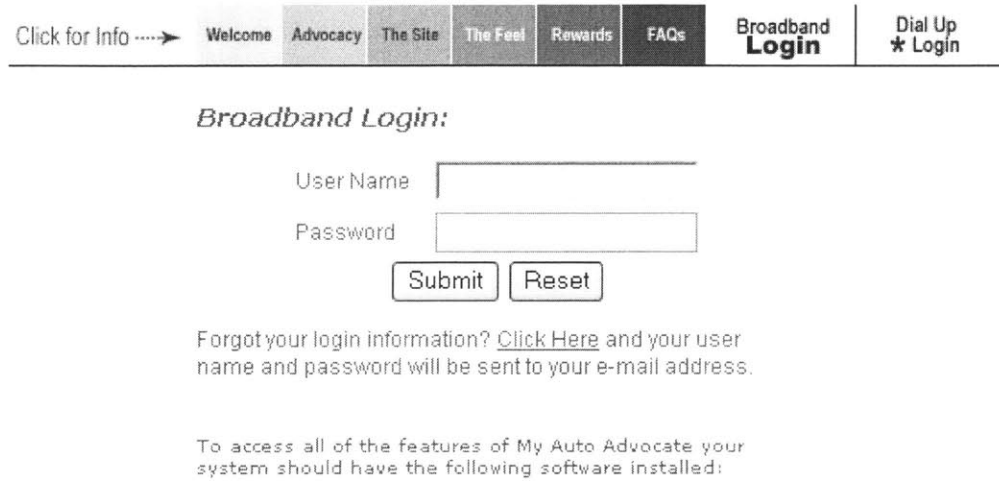


**Figure 3 – My Auto Advocate’s welcome screen text**



**Figure 4 – My Auto Advocate’s Welcome Screen – Exploring Advocacy**

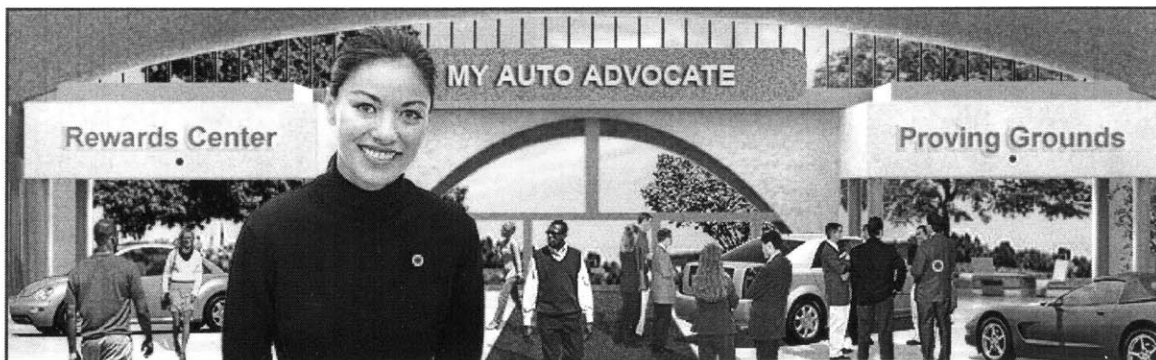
In order to access the site, the user must login to the site. Because the purpose of this web site is to immerse the user in a multimedia rich environment, it was important to differentiate between broadband users which could experience this environment without excessive loading time and dialup users which would need a much simpler experience (less download time). The login window is shown below.



**Figure 5 – The Broadband Login page**

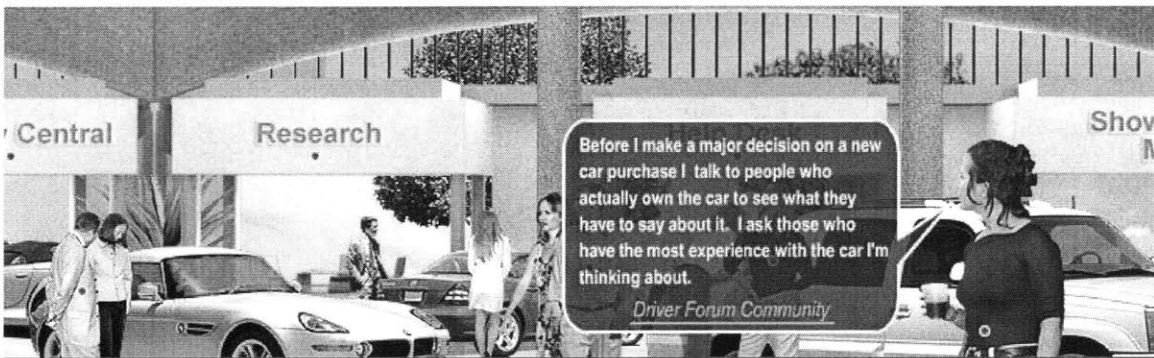
## **Panorama**

Once the user enters the site, the navigation is dominated by the panorama. As previously stated, the purpose of the panorama is to immerse the user in an experience that mimics an auto show. The user has the option of visiting various booths that lead to the features of the site. This theme is extremely relevant because the features of the site are similar to features that can be found at an auto show.



**Figure 6 – The first view of the panorama**

The panorama takes a significant amount of time to load. Because of this, two different types of panoramas were developed. The broadband version is a flash movie file that pans left and right with a simple mouseover. Hotspots added to this flash file enrich the experience. The user has a chance to click on hotspots to learn more from other “attendees” of the auto show. Here, these personas give advice on what to visit. An example of this is shown below.

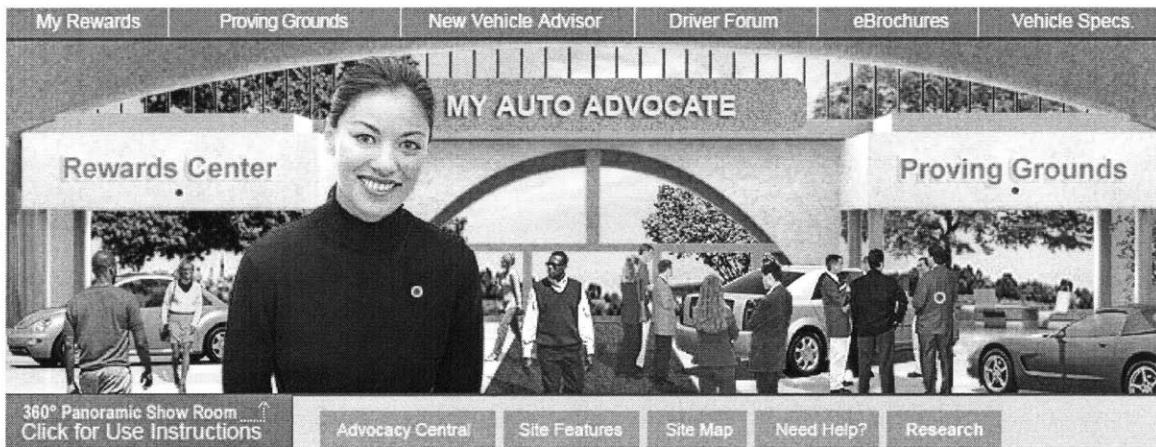


**Figure 7 – The Panorama acting as an advisor**

The dial-up version of the panorama consists of jpegs that have hot links on the edge of the images that allowed users to scroll between jpegs. Each jpeg consists of a snapshot of the auto show. Additionally, the jpegs contain hotspots that, when clicked, pop up the same advice that the flash file shows.

One of the main hopes was that the panorama would appeal to a broad group of users. For example, inexperienced users would find the panorama to be a guide to the site. Similarly, other users may enjoy the panorama because they enjoy multimedia on the

Internet. More importantly, the panorama would draw users to the site's features by making the process seamless between exploration and information gathering. However, many other users prefer a much simpler straightforward navigation system. With this in mind, a menu with direct links to the specific features was also included as an additional navigation tool.



**Figure 8 – A view of the top frame (panorama) with the menu**

## **Lower Navigation**

The lower navigation's purpose is to display all content. Content is displayed in a separate frame from the panorama. In this manner, the panorama and menu which are always the same regardless of the content do not have to be reloaded every time a user wants to view different content. There are three types of lower navigation pages. The first types are content pages. These pages include My Rewards, Research, Car Specs, and Site Map. These pages contain unique features and content hosted on My Auto



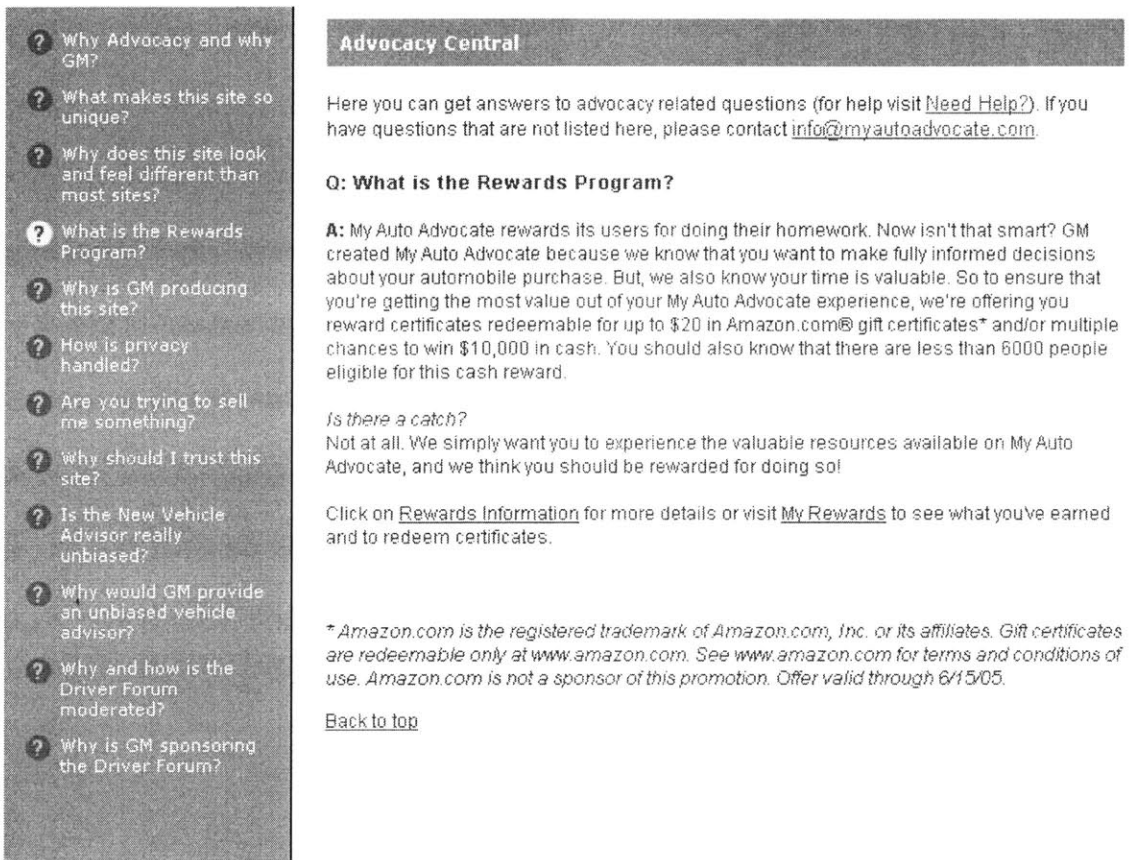
Advocate. All these pages do not offer users rewards for visiting but instead serve to flesh out the site.

The second type of lower navigation page provides helpful advice to the user. The two pages following this model are Advocacy Central and Need Help. Here, the left hand side is filled with “FAQs” commonly associated with advocacy (Advocacy Central) or MAA questions (Need Help). Advocacy Central focuses on advocacy and ways My Auto Advocate is promoting advocacy. Need Help answers questions revolving around the purpose of the site and navigation of the site. Figure 9 is a snapshot of Advocacy Central on My Auto Advocate.

Both of these pages are scaled down versions of what the GM-MIT originally envisioned. Future versions should move closer to the original goals. The GM-MIT team would like to expand the advocacy section by including a personal advisor who interacts with the user and answers all questions.<sup>2</sup> In this version, users will feel like they have a partner on the website that wants them to experience the most out of the site. This would increase the feel of advocacy and increase trust.


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<sup>2</sup> Users will have the option of choosing between multiple advisors with whom they most feel comfortable. In addition, the advisor could potentially be automated allowing for a more personable experience. Past MIT projects with Intel and Qwest have shown that advisors have a positive impact on a user’s experience on a web site.



**Figure 9 – My Auto Advocate’s Advocacy Central**

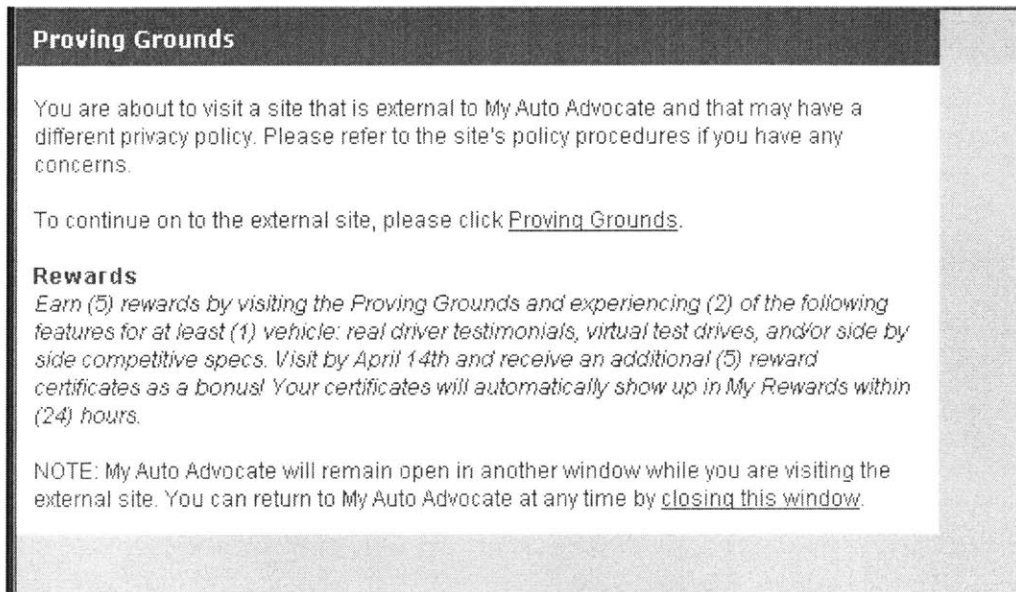
The third type of lower navigation page, known as a “treatment descriptor” (TD), is a page used to describe and sell the main treatments of the website. The TDs serve this purpose by having one section detailing the treatment and a second section devoted to the rewards a participant can earn for using the treatment. As stated before, the treatments are the Proving Grounds, Auto Show in Motion, New Vehicle Advisor, Driver Forum, and eBrochures. TDs have a left hand animated gif used to make the page more distinctive. This allows users to associate a page with a visual and better understand the purpose of the page.

<p><b>New Vehicle Advisor</b></p>  <p><b>Fun, Fast, Friendly Up-To-Date and Unbiased...</b></p> <p><b>Very Cool! →</b></p>	<p><b>New Vehicle Advisor</b>    <a href="#">Visit Now</a></p> <p>The New Vehicle Advisor that My Auto Advocate is linking to is called "My Product Advisor" (formally "Auto Choice Advisor"). This site searches over 250 different makes and models to help you identify which vehicles are right for you. Please click the "Visit Now" link above.</p> <p><b>The New Vehicle Advisor Helps You...</b></p> <ul style="list-style-type: none"> <li>• Find the vehicle that fits your lifestyle</li> <li>• <u>Generate unbiased recommendations</u> not influenced by banner ads or other product promotions</li> <li>• Narrow your focus and save time by responding to optional, easy-to-answer questions</li> <li>• Get up-to-date product and pricing information</li> </ul> <p><b>Curious Why GM Provides This Advisor?</b> The reason is quite simple - by helping today's consumers choose specific sets of vehicles that best meet their individual preferences, priorities, and lifestyles we gain valuable insight into how we might better improve our own products. <a href="#">Back to top</a></p> <p><b>Generate Unbiased Recommendations</b> The data for the New Vehicle Advisor is provided by two independent organizations - the Auto Information Center (AIC) and J.D. Power. Unlike comparison shopping and/or review sites, this advisor does not require you to sift through large numbers of products that you may know nothing about. Instead, after answering a few simple questions, you receive a short, ranked list of recommended vehicles which you can then compare side by side in detail. You can also use the "Your Garage" feature to store your preferred vehicles and return to view or change them at any time. <a href="#">Back to top</a></p>	<p><b>Earn Rewards!</b></p> <p><b>5 Reward Certificates</b> Earn rewards by visiting the advisor, specifying what you want in your next vehicle, and then asking the advisor to recommend vehicles according to your needs. Your certificates will automatically show up in <a href="#">My Rewards</a> within 24 hours.</p> <p>» <a href="#">Visit Now</a> » <a href="#">Rewards Information</a></p>
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**Figure 10 – My Auto Advocate’s New Vehicle Advisor description page**

If a user chooses to, he/she can click to “visit” the treatment. In a new pop-up window, the site gives a more thorough description of the feature they wish to visit as well as detailed rewards information. For example, when visiting the New Vehicle Advisor TD, the user is given a short description of the Auto Choice Advisor and details on how to obtain the 5 reward certificates. After the user clicks on the link to “visit”, the user is launched to the separate site. The code behind the scenes is recording a substantial amount of information as well as passing information on to the off site Auto Choice Advisor. This will be discussed further in Implementation of My Auto Advocate. A pop-up window was used because it conveniently allows users an easy way (closing the

pop-up window) to go back to the My Auto Advocate site. Below is an image of the pop-up window.



**Figure 11 – The pop-up window descriptor for GM Proving Grounds**

### ***Exploration of Existing Technologies***

Most of the technology used in the site is standard fare for web site development. These included PHP/HTML for the web site code, MySQL for the database, and Photoshop and Flash for the images and panorama. All are very standard and were chosen over other options for important reasons. There are numerous alternatives to PHP including JSP, ASP (.NET), and perl. As will described below, all these alternatives have significant strengths but do not stand up to PHP in terms of its low cost of implementation and free standard library size. There are also numerous alternatives to MySQL; again, MySQL

competes significantly well with expensive alternatives like Oracle and have certain positives over free competitors like PostgreSQL (in large part due to phpMyAdmin).

## **Utilization of PHP**

PHP is a free programming language that has the flexibility needed to build a web site. PHP competes extremely well against a lot of web-based languages that cost money. In addition, PHP works extremely well with many Linux-based databases such as MySQL. PHP code is extremely flexible and allows programmers to test and debug with ease. Moreover, PHP is an interpreted language and thus has a minimum of time between development and implementation. Finally, PHP has a large library of standard programs and archives that can be used as references.

PHP was used in every facet of the site. It was used to simplify HTML pages with its ease in creating templates. In addition, all algorithms involving user tracking and database management revolved around the use of PHP. PHP was also used for its robust security features. Additionally, it was used extensively for the user registration/login system which involved the creation of session cookies to ensure that users were tracked throughout the site.

Moreover, all access to sensitive personal data was well protected through PHP code. An important feature of the login system is that sensitive information from the database is used in a session cookie that is stored on the server. As can be seen in the code for session cookie queries, almost all personal data calls are taken from the session cookies.

Because these session cookies are stored on the server side, they are impossible to get to in any illicit way. Please view Chapter 6Appendix III for code on session cookies.

## **Utilization of MySQL**

MySQL is another free technology is one of the best of its kind. For a project of this scope, MySQL's combination of speed and reliability was more than sufficient. An extremely important tool used for the development and maintenance of the MySQL database is phpMyAdmin. It allows programmers to work graphically with a database. Besides allowing programmers the opportunity to execute SQL queries, it provides programmers with additional capability to edit and search tables and databases with ease. In addition, it easily exports query results and tables into transferrable files.

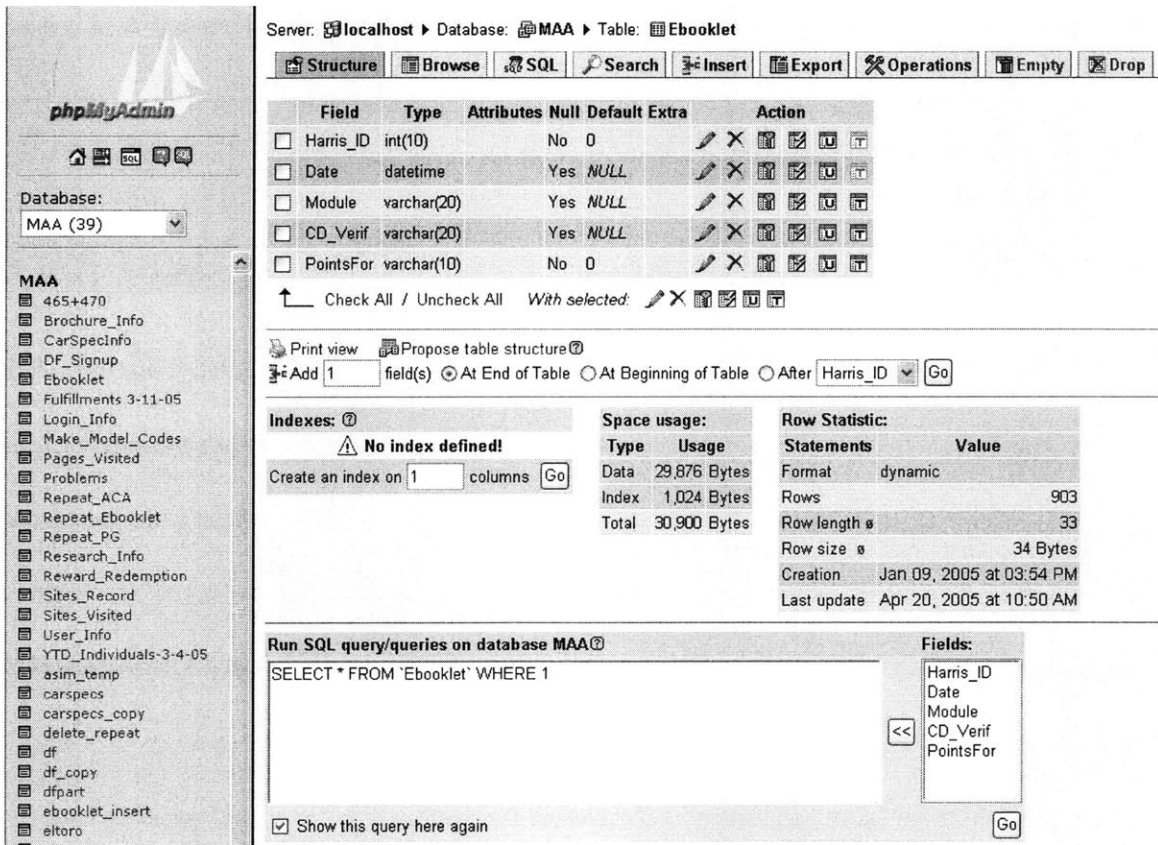


Figure 12 – phpMyAdmin interface

A robust database was important for the My Auto Advocate project. All users of the site were professional survey takers from Harris Interactive. The database needed to store crucial data obtained from participants filling out a survey with personal information questions. This information was stored in tables to be used for analysis. A large number of tables were used to store user movement throughout the site. The focus was on participant usage of the treatments: Proving Grounds, Auto Show in Motion, New Vehicle Advisor, Driver Forum, and eBrochures. However, data was also captured on user page visits to all other parts of the site.

In addition to My Auto Advocate click streams, data analysis required that the GM-MIT team look into click streams from off-sites. Thus, it was very important for the database to add new tables robustly. Almost all data was received in Microsoft Excel or Comma Separated Variable files. Microsoft Excel has an add-on feature that converted these files into MySQL tables. The table below summarizes data collected from outside parties that was stored in the GM-MIT database.

Source of Data	Type of Data Collected
Auto Show in Motion (GMR works)	Auto Show in Motion participation from My Auto Advocate members.
AIC	Automobile specifications from AIC for the Car Specs page.
Communispace	Data on user participation in the Driver Forum. This ranged from login timestamps to weekly contributions
A Hole in One	Data on lottery and Amazon certificate redemption. This ranged from redemption timestamps to redemption size.
Auto Choice Advisor	Data on My Auto Advocate member participation in the Auto Choice Advisor site. This included analysis on automobile preferences as well as automobiles recommended.
Digitas	Data on My Auto Advocate member participation in the GM Proving Grounds site. This was raw click stream data on every page visited.

**Table 1: Data Collection from Outside Sources**



Throughout the project, it was crucial for outside parties to have access to data the My Auto Advocate site was collecting. Thus, it was important to have a table that had the proper security and robustness for other parties to directly access the site. In addition, phpMyAdmin provided an important tool for manual export of data. The table below summarizes data output to other sites.

Source Destination	Type of Data Exported
Communispace	My Auto Advocate participants who have signed up for the Driver Forum.
Digitas	My Auto Advocate participants who ordered a CD version of the eBooklet.
A Hole in One	My Auto Advocate participants who have redeemed certificates for either Amazon coupons or Lottery points.

**Table 2: Data Exported to Outside Sources**

## **Chapter 4 Implementation of My Auto Advocate**

A solid set of algorithms and a robust database was necessary for My Auto Advocate to succeed. The implementation of these two factors would allow the site to successfully serve its purpose: provide users with useful and friendly information on new vehicles and help the GM-MIT team learn which trust factors contributed to higher consideration of GM vehicles and higher trust in GM.

The design of the My Auto Advocate site involved studying cutting edge marketing techniques. On the other hand, the implementation of My Auto Advocate involves heavy usage of computer science. This section studies the algorithms used to capture and analyze complex data from a myriad of sources. This involves the study of how, when, and where data is captured. In addition, it looks into the design of the database of user information to maximize efficiency and efficacy.

### ***Timetable of Implementation***

My role in the My Auto Advocate web site production constantly evolved. Initially, my purpose was to concentrate on coming up with designs for the site as well as implementing the features. However, in September of 2004, Digitas, an ad agency that specializes in web development, was hired to help work on site design. One of the main features GM Proving Grounds was put under their jurisdiction. Digitas was also responsible for the opt-in ad.

Early autumn was spent attempting to come up with a suitable design for the web site as well as the panorama. However, design of the site was outsourced to an IT consultant Kevin Thompson. Hence, my work on site design was cut down significantly. Instead, I was focused on building the architecture for the site. The site needed to be up by the end of December 2004 because the launch would be early January 2005. Integration and site development were heavily worked on during this time. On January 12, 2005 the site was launched. The following months, I concentrated on building scripts to enhance the data gathering and data processing. The late spring months focused heavily on scripts to take the database and convert it into a meaningful file for data analysis.

### ***Data Collection***

The amount of data collected for this project provided an interesting challenge in both gathering and analyzing data. The collection of data focused on two areas needed for research. The first area focuses on logins, page hits, and personal data; these are important for finding correlations between different factors on consideration and trust. The second area focuses on visits to the sites that offer rewards; this is important for the rewards system used to encourage users to visit the major “treatments”: Proving Grounds, Auto Show in Motion, New Vehicle Advisor, Driver Forum, and eBrochures.

### **User Information**

Much of the personal information is gathered through GM-MIT’s partner Harris Interactive. Harris Interactive is a site devoted to running large-scale online surveys.

The GM-MIT team hired Harris Interactive to bring in a large subject base (the goal was 5200 total subjects)<sup>3</sup> and run surveys. The first survey was given to potential users to screen for the correct subjects. Subjects needed to be in the Los Angeles region, a non-GM employee, and in the market for a new vehicle. This first survey also collected a lot of personal information important for data analysis.<sup>4</sup> This data was transferred and stored on the GM-MIT database.

Each user visit and his/her page visits are also recorded. This is important for determining the rate of success of a certain page as well as which features inspire more page visits. The table below summarizes personal user data collected.

Table Name	Purpose/Description
Brochure_Info	Table of which brochures were viewed by users.
CarSpecInfo	Table of which cars were viewed by users in the Car Specifications page
DF_Signup	Table of which users signed up for the Driver Forum.
Ebooklet	Table of viewers of the Ebooklet. Stores whether they chose to download or order a CD. Also stores whether the user has entered the 3-digit CD code (signifying that he/she has received the CD).
Login_Info	Table of user logins. Stores whether they logged in broadband or dialup. Login comes with a sessionID so that user actions can be

<sup>3</sup> The number of participants ended up being 5090. This number is below 5200 due to login problems, duplicate Harris accounts, and self-removal by Harris users.

<sup>4</sup> This included data such as internet speed, age, gender, address, operating system, browser, etc.

	tracked through the site.
Pages_Visited	Table of every page viewed by users. These pages include all the main top level pages of My Auto Advocate.
Repeat_ACA	Table of users who chose to view the New Vehicle Advisor after having viewed it at least once.
Repeat_Ebooklet	Table of users who chose to view the Ebooklet after having viewed it at least once.
Repeat_PG	Table of users who chose to view the Proving Ground after having viewed it at least once.
Research_Info	Table of every research page viewed by users.
Sites_Record	Table of which launch pages were viewed. In other words, if a user chose to view an external site, the user would next view the launch page. The external site was stored in Sites_Record along with the user.
Sites_Visited	Table of sites/pages that users visited that earned them rewards. This included E-booklet download/CD, Driver Forum sign ups/participation, New Vehicle Advisor, Auto Show in Motion, Proving Grounds, and various promotions.
User_Info	Table of information on each user. Information includes personal data, a user's system settings and purchase intent.

**Table 3: Description of tables for the My Auto Advocate website that deal with user tracking.**

## Rewards Information

The GM-MIT team felt it was crucial for certain treatments to have enough of a sample size in order for the data captured to be significant. However, without proper word of mouth and positive publicity, the treatments would probably not receive a lot of visitors. Hence, the team felt it was crucial to institute a rewards system for each of the major treatments: Proving Grounds (5 points), Auto Show in Motion (20 points), New Vehicle Advisor (5 points), Driver Forum (5 points plus participation points), and eBrochures (5 points). Moreover, during promotional periods in March and April, users could gain points for logging in and additional points for going to certain treatments.

These points could be redeemed for either Amazon certificates of equivalent dollar value (5 points = \$5 gift certificate) or lottery tickets towards a prize of \$10,000 in cash (1 point = \$1 lottery ticket). This system was integral to the success of the project and a mistake-free implementation was important to build trust with participants. The table below summarizes the data captured for the rewards system to work.

Table Name	Purpose/Description
Sites_Visited	Table of sites/pages that users visited that earned them rewards. This included E-booklet download/CD, Driver Forum sign ups/participation, New Vehicle Advisor, Auto Show in Motion, Proving Grounds, and various promotions.
Reward_Redemption	Table that contains data on reward certificates for each user. It stores the number of reward certificates earned by each user, the

	number of Amazon coupons and lottery tickets redeemed, and the number of Amazon coupons and lottery tickets processed.
--	--

**Table 4: Description of tables for the My Auto Advocate website that deal with rewards.**

### ***Algorithms Background***

This section is divided into two parts. The first part discusses algorithms used to run the site. This involves looking into login management, data tracking, and outside integration with the My Auto Advocate web site. The second part discusses database design, database integration, and database manipulation for data analysis. Both sections involve heavy amounts of code written in PHP, HTML, and SQL queries.

### ***Architecture and Systems Algorithms***

This section is divided into five sections. The first section will study integration with Harris Interactive. The second section will analyze the algorithms used for login and session management. The third section will look into page tracking and page development. The fourth section will look into the rewards system and how it was implemented. The final section looks into unique systems problems and how they were solved.

## Integration with Harris Interactive

Once a user agrees to participate in the My Auto Advocate project, he/she is transferred from Harris Interactive to the My Auto Advocate site. I designed the landing page, which acts as a bridge between the Harris site and My Auto Advocate, to perform multiple tasks. Throughout the process there are redundant checks to avoid repeat entries due to page reloads and/or repeat visits.

The main data manipulation takes place on LandingPage.php. First, it takes in the POST form data from the Harris site and ensures that the data received is correct. Because this is the first page for users who come to the site for subsequent visits (and have already been registered and had their user data recorded), it is important to also check that the user has no previous data already recorded. Next, it checks if the user has chosen a login that is compatible with Communispace.<sup>5</sup> If the login does not fit the requirements, the user then must go through the process of choosing a new login<sup>6</sup>. Once all the data conditions are met, new entries are created in Reward\_Redemption and User\_Info. All data from Harris Interactive are inputted into User\_Info. This whole process is seamless. In fact, the first thing the user sees is a welcome screen that greets the user with his/her user name. For the complete code please view Appendix I.

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<sup>5</sup> The login must be between 4-8 characters because of constraints imposed by Communispace. Harris could not perform this check so login checking was performed on the landing page.

<sup>6</sup> If the user needs to choose a new login name it is important for the login to perform error checking while passing the Harris data. The clever algorithm I implemented employs the error checking in LandingPage.php which calls NewLandingContent.php if a new login is needed. This new page prompts the user for a new login in a new form that stores the data in hidden fields. When the user submits a new login name, the script recalls LandingPage.php with the new login name replacing the old. To view this code, please view Chapter 6Appendix II.



## **Login and Session Management**

The login system for My Auto Advocate is a rather complex system because of all the various scenarios presented. There were three reasons for having a user/pass rejected by the system: an invalid user/password combination, a user logged in past the deadline for first time users to login, a user has attempted to use a deactivated account. In any of these cases, the user is lead back to the landing page with an explanation of what went wrong for the user.

If the user has successfully logged in, this event is stored in login\_info. Next, a session cookie (which expires after the user closes the browser window or logs out) is created and information relevant to pages on the My Auto Advocate web site is stored in session variables. This allows for quick access of data to prevent slow database calls. Two different pages were created for dialup and broadband logins, however, the essential change involves a single session variable change (the “login” variable) and different type of login specified in the table entry. See Appendix III for the complete code.

## **Page Tracking and Page Development**

PHP was used expertly for both page development and page tracking. In essence, it capitalizes on PHP’s ability to call other files with ease by using template files that could be repeatedly used for similarly designed pages. Header.php was called by all the

description pages. This page contained all the formatting information and overhead html. It also inserted in the animated gif associated with each page <sup>7</sup>.

The main content is then displayed through standard HTML. The final step is displaying the footer code. This is also a separate file and contains all common formatting needed at the end of each page. This style was used for the following pages: Proving Grounds, Auto Show in Motion, New Vehicle Advisor, Driver Forum, eBrochures, Car Specs, Research, Brochures, and My Rewards. For an example page, please see Appendix IV.

If a user decides to use a feature that was hosted off site (such as the New Vehicle Advisor), a user was brought to LaunchPage.php. This page was the communal gathering place for off sites such as GM Proving Grounds, Auto Show in Motion, Driver Forum, and the New Vehicle Advisor. Based off which page the user wanted to go to, different information and links were displayed. Each page required a unique and different way of integrating with other sites.

The Driver Forum (run by Communispace) required that member information be passed along. This required building a hidden form that sent POST form data. All other sites required sending user information in GET data; this involved adding relevant information to the end of the URL. In addition, database entries were created based off of whether the user's visit was a repeat or not. For New Vehicle Advisor and Proving Grounds,

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<sup>7</sup> Information is passed between files by storing a variable locally. For example, the image location used by Header.php is stored by the host file in a variable called \$image. Header.php then calls \$image and inserts the image. In this manner, the unique image corresponding to the host file can be displayed even though a generic template header is used.

certificates are awarded for first time visits. This involves making an additional entry to Sites\_Visited and modifying Reward\_Redemption. Subsequent visits are stored in either Repeat\_ACA or Repeat\_PG based on which site is being visited. Every visit, regardless of it being a first time or not, is stored in a master table Sites\_Record. For the complete code please view Appendix V.

Other pages required more unique ways of tracking users or ways of displaying unique/relevant content. These situations will be described in more detail in System Problems and Solutions.

### **Rewards Implementation**

Page tracking and page development gave a description for how the site tracked page hits. While tracking page hits, certificates were also rewarded. For GM Proving Grounds and New Vehicle Advisor, users were rewarded points (with entries in Sites\_Visited) by going to the respective off sites. Auto Show in Motion points were rewarded by taking in information from GMRworks, integrating the data into the MAA database, and running scripts to update Sites\_Visited and Reward\_Redemption. This is described further in Database Integration. Points for the Driver Forum were done similarly. Finally, points for eBooklet are rewarded in two ways: if the user downloaded the eBooklet, points were instantly rewarded. If the user chose to order a CD eBooklet, points were rewarded after the user typed in the three digit code in the My Rewards section.

In essence, the bulk of the Rewards implementation happens in My Rewards. My Rewards satisfies these goals:

- Lists the sites visited that have earned rewards. See the image below for an example table.
- Lists the rewards certificates redeemed including the available rewards certificates.
- Allows users to redeem certificates for either Amazon coupons or Lottery tickets.
- Allows users to enter their three digit code for eBooklet points.

The screenshot displays the 'My Rewards' interface. On the left is a vertical sidebar with a car image and the text 'My Rewards' at the top and 'Earn & Redeem' with a right-pointing arrow at the bottom. The main content area has a header 'My Rewards' and a paragraph of information. Below this are three tables: 'Your Rewards Earned', 'Your Rewards Redeemed', and 'Redemption Center'.

**My Rewards**

For information on how the rewards program works, please click [Rewards Information](#). If you have questions about your rewards, please contact [support@myautoadvocate.com](mailto:support@myautoadvocate.com).

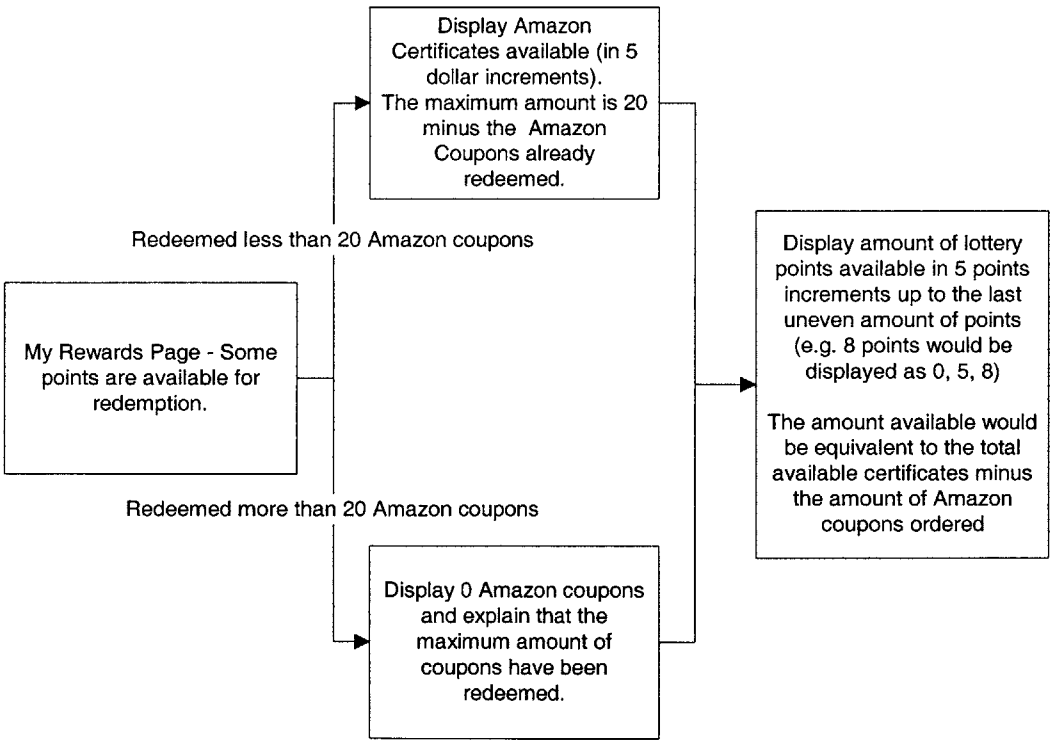
Your Rewards Earned		
Rewards Earned	Activity	Date Earned
5	Visited the New Vehicle Advisor	2005-01-11 06:04:35
5	Viewed the GM eBooklet during a promotion	2005-03-03 13:33:55
3	Logged into MAA during the March promotion	2005-03-03 12:51:48
5	Viewed the GM eBooklet	2005-03-03 13:33:54
10	Visited GM Proving Grounds	2005-04-01 00:13:38

Your Rewards Redeemed		
Total # of Certificates	Amazon Coupons Redeemed	Sweepstakes Points Redeemed
28	\$20	\$0

Redemption Center		
# of Certificates Available	Step 1: Amazon Coupons	Step 2: Sweepstakes Points
You currently have 8 certificates available	Choose the amount of Amazon coupons: \$ <input type="text" value="Select"/> <input type="button" value="Go"/>	Please choose the amount of amazon coupons first.
	<b>You have earned the maximum amount of Amazon coupons available. Please use all available certificates for Sweepstakes points.</b>	

Figure 13 – My Rewards example table

Listing of sites visited and points redeemed involved straight database queries. On the other hand, redemption of points involved more complicated algorithms. Up to 20 certificate points were redeemable for Amazon coupons in 5 dollar installments. If there were an odd number of points left over (regardless if there were more or less than 20 certificates) these would only show up for lottery points. It is important to note that this system was made to be flexible so that any amount of certificates can be redeemed at one time while making the process very simple for A Hole in One (AHNO) to process. The flow diagram below demonstrates the process of reward redemption on the user level. For the complete code please view Chapter 6 Appendix VIII.



**Figure 14 – Simplified reward redemption flow diagram.**

Reward\_Redemption was setup so that this type of redemption system could easily be implemented. Five columns had relevance. Their descriptions can be found in the table below. It is important to note that Pts\_Earned serves as the basis for the total points earned thus far. Redeemed points are put in Earned\_Amazon and Earned\_Lottery. If these points have been processed by AHNO they are placed in Proc\_Amazon and Proc\_Lottery<sup>8</sup>. Separation of earned and processed is important innovation. It ensures that the redemption company (AHNO) can clearly define who needs to earn points at any time. It also makes it very easy for the redemption company to confirm that points have been awarded (by moving points from earned over to processed).

Column Name	Column Purpose
Pts_Earned	Total amount of certificates earned by the user
Earned_Amazon	Total amount of certificates the user has redeemed for Amazon coupons that have not been processed by A Hole in One (AHNO) as of yet.
Earned_Lottery	Total amount of certificates the user has redeemed for lottery points that have not been processed by A Hole in One (AHNO) as of yet.
Proc_Amazon	Total amount of redeemed certificates for Amazon coupons that have been processed by AHNO and awarded to the user.
Proc_Lottery	Total amount of redeemed certificates for lottery points that have been processed by AHNO and awarded to the user.

<sup>8</sup> It is important to note that the scripts ensure that the total number of Amazon points redeemed are Earned\_Amazon plus Proc\_Amazon.

## **Systems Problems and Solutions**

There were many unique problems to this project. I have chosen two particular examples that should showcase some unique algorithms that could be useful for advocacy web sites, especially those that involve a rewards system.

The first problem was that rewards and database entries needed to be made for users that have chosen to download a file. However, it is not possible to simply run a PHP script and then display a file for download. To get around this, an algorithm was setup in this manner: within the script that called the database, the file that the user chose to download is then put into the header file with the PHP function *header*. Then to prevent any other script from being run, the program exits. From the user side, the script simulates a straight download process. See this code in Chapter 6 Appendix IX.

The second problem was determining how to deal with the unique situation with eBooklets. Essentially, the GM-MIT team wanted to give users the option to download eBooklets. However, due to the enormous size of the eBooklet, the eBooklet was split into 5 downloadable chapters. Each chapter focused on an idea. In the first survey users had to fill about their preferences, Harris gained information on a user's ideal vehicle feature. These features were Inspirational Style, Proven Quality, Rugged Performance, Advanced Safety, and Breakthrough Innovation. In order to streamline the process, the first download was of the chapter that the user specified as his/her preference. Reward certificates were then given to the user for that download. Afterwards, users were given

the option of downloading any of the chapters. If the user chose to order a CD, the site also allowed the user to view any of the chapters for downloading. Hence, there are two states: before any action, and after action (ordering/downloading the eBooklet). To view the eBooklet code dealing with displaying the different states of the eBooklet page please view Chapter 6Appendix X. To view the way the CD ordering process worked please view Chapter 6Appendix XI.

### ***Database Algorithms***

This section is divided into three sections. The first section will study the individual tables and the overall database design. The second section will look into algorithms dealing with integration between systems. The last section will deal with algorithms used for database output used for analysis purposes.

### **Database Design**

The database was designed to maximize the post-project data analysis. In addition, the data had to be robust enough so that the GM-MIT team could make changes to rewards, promotions, or site design to improve the site experience (e.g. to increase traffic to a certain treatment). This implies that user data needed to be recorded robustly and was interconnected in a manner such that SQL queries could easily find interrelated correlations between tables. Hence, it was important to have both detailed click stream data tables as well as aggregate tables for fast analysis. However, it was also important to



limit the number of tables in order to prevent too many tables from needing to be updated at one time.

In addition, the database had to contain a way for the rewards system to function in a simplified manner while allowing A Hole in One (which needed to integrate with our system) a very straightforward way to work with the MAA database. To go along with the integration thread, daily data exchanges with Communispace and Digitas were also necessary. Hence, it was important for data from other parties to be integrated with ease (without too much changes needed from other tables).

The table below summarizes the overall database design. Here are some things to note:

- The unique ID, the Harris\_ID, is included in all tables. This was crucial as a linking key between all tables. This ID was used to join multiple tables together in large SQL queries.
- A master table, User\_Info was extensively used throughout the site. It was especially important for output information as well as data integration with other sites. Essentially, using the Harris\_ID to link this table with other tables proved crucial.
- Some columns were redundantly put in multiple tables. This was to allow other sites to directly link to the MAA database and work with one individual table.
- Repeat\_PG, Repeat\_Ebooklet, and Repeat\_ACA were created to determine if users are visiting multiple times to important treatments.

- Treatments were the four features that offered rewards for participation. Non-treatments were features that offered no compensation but provided important content for the user.
- Reward Data was limited to two tables to ensure that reward redemption would be simplified. This made it easy on AHNO to redeem rewards. It also made it easy for MAA to add/remove rewards and add points during promotion periods.

<b>Basic User Data</b>	
<b>Login_Info</b>	
Field	Type
Harris_ID	bigint(10)
Time	datetime
SessionID	varchar(10)
Login	varchar(20)
Connection	varchar(10)
<b>User_Info</b>	
Field	Type
Harris_ID	bigint(10)
Fname	varchar(20)
Lname	varchar(20)
Password	varchar(20)
Email	varchar(50)
Street	varchar(100)
City	varchar(50)
State	varchar(50)
Zip	varchar(10)
Gender	char(2)
Age	int(3)
Pref_Attrib	char(2)
OS	varchar(10)
Browser	varchar(20)
ModemSpeed	varchar(10)
Login	varchar(20)
V_Brochure	tinyint(1)
Date	datetime
Pur_Period	varchar(10)
Pur_Type	varchar(10)
Survey_Source	char(3)
Deactivated	tinyint(1)

<b>User Data on Non-Treatments</b>	
<b>Brochure_Info</b>	
Field	Type
Harris_ID	bigint(10)
Time	datetime
Brochure	varchar(200)
<b>CarSpecInfo</b>	
Field	Type
Harris_ID	bigint(20)
Session_ID	varchar(10)
Brand	varchar(20)
Model	varchar(20)
Time	datetime
<b>Research_Info</b>	
Field	Type
Harris_ID	bigint(10)
Time	datetime
Site	varchar(200)
SessionID	varchar(10)

<b>Reward Data</b>	
<b>Reward_Redemption</b>	
Field	Type
Harris_ID	bigint(20)
Pts_Earned	int(3)
Earned_Amazon	int(3)
Earned_Lottery	int(3)
Proc_Amazon	int(3)
Proc_Lottery	int(3)
Fname	varchar(100)
Lname	varchar(100)
Email	varchar(100)
<b>Sites_Visited</b>	
Field	Type
Harris_ID	bigint(20)
Site	varchar(50)
Points	int(3)
Date	datetime
Activity	varchar(50)

<b>User Data on Treatments</b>	
<b>DF_Signup</b>	
Field	Type
Harris_ID	int(10)
Date	datetime
UserName	varchar(8)
Password	varchar(16)
<b>Ebooklet</b>	
Field	Type
Harris_ID	int(10)
Date	datetime
Module	varchar(20)
CD_Verif	varchar(20)
PointsFor	varchar(10)
<b>Repeat_ACA</b>	
Field	Type
Harris_ID	int(10)
Date	datetime
<b>Repeat_Ebooklet</b>	
Field	Type
Harris_ID	int(10)
Date	datetime
Module	int(3)
<b>Repeat_PG</b>	
Field	Type
Harris_ID	int(10)
Date	datetime
<b>Sites_Record</b>	
Field	Type
Harris_ID	int(10)
Site	varchar(100)
Date	datetime
Login	varchar(10)

Figure 15 – Top-Level Database Structure

## **Database Integration**

Part of the design focused on how the database would be integrated with other parties throughout the MAA survey. These parties included A Hole in One (the redemption company), integration with Auto Choice Advisor (New Vehicle Advisor), Communispace (Driver Forum), and Digitas (eBooklet and Proving Grounds).

## **Database Output**

The purpose of marketing design, database design, and algorithm development is to find out which trust methods work and don't work. The GM-MIT team's main purpose is to convince GM that in some form, trust-based marketing is crucial to success. The final determination of this comes from statistical analysis of the data captured by this project.

There were two important scripts written that were used for data output. The first DBinfo.php provided crucial real-time data on the project. This allowed the GM-MIT team analyze the health of the site and determine which treatments needed more incentives in order to reach statistical significance. It was also used to catch bugs and determine the success of promotions.

The second script Output.php took in data from the MAA database then parsed, analyzed, and combined the data in a manner that could be used by Matlab (producing a numbers only comma separated variable file) for data analysis. This data was combined with

survey data <sup>9</sup> to produce a very rich set of data to be used for analysis. As of this time, the results of the data analysis have not been completed as this project runs until June 15.

## Description of DBinfo.php

DBinfo.php is a comprehensive information source for all members of the GM-MIT team. The table below summarizes each of the sections and explains the content for each section. In general, each row has three columns. The first column describes the data, the second column displays the numeric value, and the third column gives a percentage that is relevant to that value.

This page is unique because it gives percentages and calculates numbers on data that does not exist in the MAA database. It also can create “archived” versions of the page by narrowing the database query to specific date ranges.

Section Title	Section Fields and Description
User Data	<i>User Data</i> lists the total number of users. It also has a separate field for the total number of users after script change (ASC). The scripts that calculated which users logged in were implemented after the survey started; hence, some data is dependent on the total number of users in the project and total numbers after the login script was initiated.

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<sup>9</sup> The first survey was the screener that found a set of Harris Panel users that were fit for the MAA project. Each subsequent survey was conducted every month and was given to every member of the MAA project as well as a control group. Surveys asked participants detailed information on preferences, trust in GM, and opinions on MAA treatments.

Ebooklet Data	<p>This section has a lot of information because Ebooklet usage has multiple forms. It contains data on total Ebooklet point earners and total Ebooklet users which constitutes all Ebooklet point earners (downloaders and those that entered a CD code or have downloaded the eBooklet) plus those that ordered a CD and may but have not entered the confirmation code). In addition, it further breaks down the groupings into Ebooklets downloaded vs. ordered. PDF Brochure users <sup>10</sup> are also listed (with breakdown of GM PDF brochures vs. non-GM PDF brochures). An overall number that shows the total number of GM brochure viewers (PDF and eBooklet) is also shown. This is calculated by adding the two totals and subtracting the overlap.</p> <p><sup>11</sup> This is important because it gives an overall feel for the total number of users interested in learning specifically about GM.</p>
Driver Forum Data	<p><i>Driver Forum Data</i> lists sign ups and registered members. Participants sign up for the Driver Forum then must wait for confirmation from Communispace. Only after confirmation are users allowed to log in and begin contributions (by logging they are also rewarded certificates). Hence data in this section shows information on sign ups, users, and page views.</p>
ACA Data	<p>This section shows data on New Vehicle Advisor.</p>

<sup>10</sup> PDF Brochures are included in this project on the same page that offers the GM eBooklet. These pdf brochures are company or model brochures in PDF that advertise either a brand or a particular model.

<sup>11</sup> The overlap is calculated using a clever query shown here: `select DISTINCT Ebooklet.Harris_ID from Ebooklet LEFT JOIN Brochure_Info ON Ebooklet.Harris_ID = Brochure_Info.Harris_ID WHERE Brochure_Info.Time < '$enddate' AND Ebooklet.Date < '$enddate' AND (Brochure_Info.Brochure LIKE '%gm.com%' OR Brochure_Info.Brochure LIKE '%buick%'`

ASIM Data	This section shows data on the Auto Show in Motion. Page visits vs. external web site visits (which are shown for all sections) are especially important here because the total number of registrants is unclear (due to GMRworks problems).
GM Proving Grounds Data	This section shows data on the Proving Grounds. Because this section was launched mid-survey with a promotion bonus, it also contains promotional data.
March/April Promotion Data	This lists the complete promotion data for March and April. This includes log-ins and increases in treatments that got promotion reward certificate bonuses.
Treatment Data	Lists number of participants per treatment.
Other Data	Contains number of users who used Car Specs, Research, and My Rewards.
Rewards Certificates Information	Lists in 5 point increments, the number of users who have earned certificates. Hence it shows users who have earned between 1-5, 6-10, etc. until 96-100.
Opt-in vs. Non Opt-in Treatment Sign ups	Shows treatments visits between opt-in and non opt-in users. Includes visits to Driver Forum, ASIM, etc.
Opt-in vs. Non Opt-in Purchase Intent	Shows purchase intent in relation to opt-in vs. non opt-in. Purchase intent involves how soon a user intends to buy a vehicle.

**Table 5 – Description of the sections of DBinfo.php**

Archived pages were created by manipulating the date function provided by PHP. *Strtotime* is used to convert a string to date timestamp. Using this function, I convert the script by using the string “-\$index day” where \$index represents a decremented number (for each day from the start of the survey until present day). The timestamp is then converted into a displayable string by using the function *date* in this manner: `date("l dS of F Y", $newvalue)`. Then each is displayed. This allows the user to select any date range. This is placed in a form that allows a user to reload the script with a new date range. The new date range is read in by the script and stored in \$enddate. Subsequently, all SQL queries include a condition to limit the date range to within the start date and end date specified by the user. The image below shows a part of the display that shows the *date* function in use.



**DB info**

Note that some information is based off of total users **after the script change** (labeled **ASC**). I added a bunch of scripts to record additional information. This information only exists for users after the script change (all users who joined the site after 1/11/05 6:00PM EST). All other data is based off of all users.

View an archived version of this page:

This data is through 2005-04-20 11:17. Information is only valid for current date. Please use the menu item above. NOTE: Redemption

Stat	Important %'s
Total users ASC	
Total users	
Stat	Important %'s
GM Ebooklets users (total)	17.74% of total users
GM Ebooklet point earners (total)	12.63% of total users
Ebooklets downloaded	45.40% of total eBooklets
Ebooklets ordered (CDs)	62.23% of total eBooklets
Ebooklets ordered (CDs) <b>confirmed</b>	25.80% of total eBooklets
Brochures Page viewers ASC	39.12% of users ASC
GM Ebooklet users ASC	47.91% of users who viewed Brochures page
PDF Brochure users ASC	14.06% of users ASC
GM PDF Brochure users ASC	5.496% of users ASC
Total GM brochure users (PDF and Ebooklet)	1046 21.85% of users ASC

Discussion Forum data

Stat	# of Unique Users	Important %'s
Discussion Forum sign ups (total)	1031	20.25% of total users
Discussion Forum <b>processed (signed up and logged in)</b> sign ups (total)	751	72.84% of sign ups
Discussion Forum page viewers ASC	1971	41.19% of users ASC

**Figure 16 – DBinfo.php in use**

Percentages are based off of ratios that make the most sense and are most important for data analysis. For example, page views of an external page are compared as a percentage of the total number of page views of the information display page. This number is critical in determining the success of converting viewers of the informational page to viewers of external content. Percentages are displayed using the substring function

*substr* and used by storing the denominators in separate variables. An example is: `substr(100 * $numtotalearbooks/$totalusers, 0, 5)`. Here `$totalusers` is a global variable representing the total users in the MAA project.

This page shows unique content using innovative techniques. For example, it compares Opt-in users vs. non opt-in users in comparison to purchase intent and opt-in users vs. non opt-in users on treatment visits.<sup>12</sup> These tables were crucial in determining how to change the percentage of opt-in users and also in determining the effectiveness of the ad that allowed users to opt-in. To view the ad, please look at Chapter 6Appendix XIV. The script used complex queries that combined tables to get information on opt-in information on users (from `User_Info`) and user data on treatment visits. Using LEFT JOINS, these scripts were able to extract the relevant opt-in users vs. non opt-in users comparison. For the complete script please look at Chapter 6Appendix XII.

## **Description of Output.php**

`Output.php` is a script that combines the tables from the MAA database. The script is relatively simple because of the design of the tables. The majority of the script runs standard queries that use LEFT JOINS to combine column information. This underscores the importance of database design to simplify data extraction. The more difficult part of the program is parsing and inserting data from tables taken from external sites. This

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<sup>12</sup> Opt-in users are users who were directed to an ad created by Digitas at the end of the first survey (before ever viewing the My Auto Advocate web site) and choosing to visit and be a participant in the My Auto Advocate experiment. This is different from non opt-in users who were directly sent to My Auto Advocate after completing the survey.

involved more complex search queries, however, this was also simplified because the unifying data, the Harris\_ID.

The output data structure is standard. Each user, and his/her associated Harris\_ID, has an associated individual row. Each row contains data on everything on the user that is important for data analysis. This includes personal information from the Harris surveys, page visits on MAA, and click streams from external sites. All these are combined into one table composed exclusively of numbers (there is a key that converts the numbers to its associated meaning). In this manner, data analysis can be performed in Matlab with ease. Please see Chapter 6 Appendix XIII for the complete code.

### ***Summary of Implementation***

Much of the implementation described in this section revolved around ensuring a smooth user interface with thorough data tracking. This section thoroughly describes how the user interface successfully created a strong, positive user experience. In addition, it goes into detail on how the site tracked participant usage of different treatments and how this data was stored. In addition, it describes the code used to take the data and interpret it for data analysis.

## **Chapter 5 Implications and Conclusions**

As of this writing, the bulk of the study has been completed. However, the My Auto Advocate project does not conclude until June 15, 2005. In the meantime, a lot can be learned from a marketing stand point from preliminary data. In addition, much can be gleaned from the study on rewards, promotions, and mass emails. In essence, this is a project that taught the GM-MIT team a lot on what to do to scale up a national version of My Auto Advocate.

This section will discuss, from a computer scientist's standpoint, conclusions that can be drawn from this project. This project involved a substantial amount of code and database design and a lot can be learned from what worked and what needed improvement. Along those lines, this section will discuss improvements that can be made to a future scaled-up version of My Auto Advocate. This project has seen its fair share of turmoil and a lot of substantial but straightforward fixes could go a long way towards creating a revolutionary market-changing web site.

### ***Improvements and Future Work***

From a computer scientist standpoint, a lot can also be learned from mistakes. This section will focus on a few factors that I feel are most important for the success of a future version of My Auto Advocate. First, it is necessary to implement a more detailed page tracking system that uses standard column headers for quick integration. Second, it is important to use more rigid control of the rewards system; in other words, integration

with external sites must involve error-checking and cross checking to ensure that the user did actually experience a treatment and a user's completion of a treatment was always recorded. Finally, the site needed to improve on some basic visual and structural design.

## **Improvements in Page Tracking**

When I first started this project I was repeatedly told that only a few user data points needed to be recorded. I needed to only track user's participation in treatments.

However, as the project got started, I realized the importance of tracking the majority of a user's clicks through the site. Essentially, it was important to capture click stream data. I added page tracking capabilities to each of the pages plus recorded logins. In addition, I added unique session identifications so that each user's login can be tracked from start to finish.

One of the conclusions that can be drawn from this site is that tracking is extremely important. Even if the statistician in a group specifies that he/she wants only certain data, it is important to capture every click of a user plus congregate information. This became apparent when the GM-MIT group attempted to locate where the MAA site was losing users. Without tracking a user's every click, I could only guess as to what was causing the logjam. Moreover, by tracking every mouse click it becomes much easier to spot problems. There were a couple of cases where some scripts were not running properly. These problems would be spotted a lot sooner if all click stream data was recorded. Moreover, complaints from users could more easily be resolved with additional click stream data.

An additional tool that would be useful which should be developed for future uses is a script that takes in a user's email, username, or ID number and displays every visit of the user that corresponds to the inputted identification. Using a color coding or organizational scheme, I would be able to view every visit in chronological order. With this script, I could also diagnose user problems easily. In addition, the congregated data would give the statisticians a very in-depth picture of what is working and not working with the site.

### **Control Over Rewards**

Without solid word of mouth which was not possible for this project, there would have been very few visitors to the various features of the site. Simply put, there is no draw to look at a web site's features that are not known to the user as either useful or productive. Hence, the reward system was not only helpful, it was necessary to obtain a large enough sample size.

Previous research indicated that through the use of traditional advertisement, the cost per new customer was so high that money losing projects such as Auto Show in Motion actually were still cheaper than traditional advertising. Hence, the use of a rewards system became not only a feature that needed to be used for a small study, but something that could potentially be profitable in a national web site.

Hence, determining the best way to implement rewards for a scaled-up version is crucial. First, the control of the rewards system needs to be more centralized. Currently, MAA relied on General Motors R\*Works for the list of MAA members who went to the Auto Show in Motion. This was a complete disaster as the list was far from complete. Registrants, in many cases, were not informed that it was mandatory to tell the Auto Show in Motion ticket booth that they were participants of the MAA study. In addition, there were many other problems with data collection. The time delay between the Auto Show in Motion to the time that reward points were posted (in some cases more than a week) would be unacceptable for a large scale professional rewards program. My proposal for the Auto Show in Motion would be a centralized registration on the My Auto Advocate site. Every registrant would receive a few periodic email reminders with an ASIM identification number that registrants must tell the Auto Show in Motion ticket booth in order to receive reward points. With this system, there is no confusion from users and there are no mix-ups on the MAA side. As a final step, the ticket booth would enter the names into a database which automatically feeds into the MAA database. Hence, rewards would be instantaneous after the user has entered the Auto Show in Motion.

The Driver Forum is also another decentralized system that needs to be centralized within MAA. Much of the problem stems from Communispace's lack of technical know-how. The time it takes for Driver Forum sign ups to be registered users in the Driver Forum can be more than 48 hours. In many cases, this disparity will cause many users to lose interest. This process needs to be instantaneous. Users should be able to sign up and

start using the Driver Forum immediately. Only in this manner will MAA be able to sustain a strong community that includes many new voices.

This decentralization and lack of automation really hurt the continuity of a user's experience in My Auto Advocate. I believe that this negatively affected the overall participation on the site. In addition, it probably made the site feel less than professional and decreased the trust level from users. Finally, the lack of automation also increased the amount of manual labor which could become unrealistic in a large scale project. The increase in support emails and manual table transfers were achieved without too much hassle for this project but would be very hard to manage in a scaled up version.

## **Improvement in Design**

I felt the site worked fluidly and served its purpose well. However, there were places where users could have an improved experience. Future versions of the site need to have the Auto Show experience but content should either appear within the Auto Show window or the Auto Show experience needs to take up less space. This is important because no matter what, content is still more important than the experience. There were many user complaints on how much room the panorama took. In addition, I felt that the site felt a little dry. Future versions need to have more graphics that are relevant to a feature. The GM-MIT team was definitely limited because of time and a lack of a devoted graphics artist on the project.



Improvements could also be made to the structural design of MAA's backend. The database needed to be more centralized. There were too many different tables that needed to be updated. If there was a more central click stream system it would probably simplify many of the output scripts used to track problems and user data. Improvements could also be made to the template system. The templates I created simplified page editing and new page creation, however, I felt that additional templates could be achieved. I felt that the header and footer files used for templates should be so flexible that any page could use these files. In the current version, only basic page displays (such as information for My Rewards, New Vehicle Advisor, etc.) used this template. All other pages on the My Auto Advocate site did not take advantage of templates. This would be cumbersome in a large site because updates to an image or style design would require changing multiple pages instead of one template.

Much of the improvements revolve around improving, in some form or another, flexibility within the component. One of the last design factors should revolve around increased flexibility in the overall design of the site. This means improving the flexibility of the database and the type of data tracked. With this flexibility should be a mechanism that allows the site to easily locate ways to improve the site and update the site to reflect the change in improvement.

In addition, it is necessary to improve the design of the site. As stated above, this means working to make the user experience more flexible (make the panorama an optional experience perhaps) and the rewards system more flexible. This may mean giving more

leeway to GM on points in order to avoid confusion from the participants. This would increase trust and give GM the flexibility to offer "additional" points to users who would be much more grateful than users who received rewards after a perceived "mixup" on GM's end due to inflexible rewards rules. In essence, it is absolutely essential to give GM total flexibility in the rewards in order to maintain trust with the customer.

### ***Closing Thoughts***

This project explored areas of marketing and computer science that are not well publicized. Thus, this thesis contains ideas and code that will be new to a lot of people. However, most of the ideas are not revolutionary. The use of trust-based marketing is a concept that has been championed for many years by a vocal minority including Professor Urban. MySQL and PHP are languages that have been around for many years and most of the algorithms developed probably have been around in one form or another. However, through my year and a half of research in this project I have encountered a strong ignorance for both trust-based marketing and computer science algorithms for trust-based marketing sites.

The majority of advertisements, in spite of the shrinking information disparity, still focus on push-based marketing techniques. In addition, many of the features of MAA were met with large skepticism from participants because of the lack of trust that push-based marketing has placed in everyday consumers. I felt the GM-MIT team has made exceptional progress in challenging typical push-based marketing techniques and this thesis and future data will continue to support this change.

The lack of algorithms behind implementing rewards systems is surprising. It is very easy to find software packages that build online stores, message boards, graphical tools, and other packages; however, the rewards system is an unexplored topic. In fact, the team probably learned the most out of implementing a rewards system. In general, a lot of new scripts and algorithms are embedded within the output code and data structure; these scripts may well prove useful in a scaled up version of My Auto Advocate, which, if executed correctly, would truly revolutionize marketing on the Internet and the computer science algorithms related to this emerging field.

## ***Contributions***

This paper successfully described the following that was achieved by the My Auto Advocate project. This includes:

- 1) Design and implementation of a trust-based website My Auto Advocate
- 2) Description and design of a database that successfully serves the purpose of research and data management of a trust site. It also discusses the algorithms necessary to successfully track the users in the site and off external sites.
- 3) Design and implementation of a rewards system. A rewards system on a web site in such a large scale fashion is a new concept in marketing. This paper looks into why this rewards system was implemented and how it was successfully accomplished. It also discusses problems with the rewards and what can be learned from these mistakes.

## Chapter 6 Appendix

This section contains code that is referenced in earlier parts of this thesis. A large amount of code was produced for this project. For purposes of brevity, only pertinent code to this thesis is included. This section also includes images that would counter the flow if placed in the thesis.

### *Appendix I LandingPage.php*

```
<?
if(empty($_POST['Q305']) || ($_POST['Q305'] != '*d$q489x'))
{
    $firsttime = 0;
} else {
    $user="webuser";
    $password="1q2w3e";
    $database="MAA";
    mysql_connect(localhost,$user,$password);
    @mysql_select_db($database) or die( "Unable to select database");
    $i[1] = $_POST['Q3']; // Harris ID
    $i[2] = $_POST['Q1000']; // Fname
    $i[3] = $_POST['Q1001']; //Lname
    $i[4] = $_POST['Q1025']; // Password
    $i[5] = $_POST['Email']; // Email (originally Q1006)
    $i[6] = $_POST['Q1002']; // Street
    $i[7] = $_POST['Q1003']; // City
    $i[8] = $_POST['Q1004']; //State
    $i[9] = $_POST['Q1005']; //Zip
    $i[10] = $_POST['Q102']; //Gender
    $i[11] = $_POST['Q105']; //Age
    $i[12] = $_POST['Q535']; // Pref_attrib
    $i[13] = $_POST['Q342']; //OS
    $i[14] = $_POST['Q8']; //Browser
    $i[15]= $_POST['Q340']; // ModemSpeed
    $i[16] = $_POST['Q1020']; //Login
    $i[17] = $_POST['Q465']; //Pur_Period
    $i[18] = $_POST['Q470']; //Pur_Type
    $i[19] = $_POST['Q360']; //Survey_Source

    $firsttime = 1;
    for ($index = 1; $index < 20; $index++) {
        if ($i[$index] == "") {
            $firsttime = 0;
        }
    }
    if ($firsttime != 0) {
        $query = "SELECT * FROM User_Info WHERE Harris_ID=$i[1]";
        $result = mysql_query($query);
        if (mysql_numrows($result) == 0) {
            $query = "SELECT * FROM User_Info WHERE Login='$i[16]'";
            $result = mysql_query($query);
            $length = strlen($i[16]);
            if (mysql_numrows($result) != 0 || $length > 8 || $length <
4) {
                include "NewLandingContent.php";
                exit;
            }
        }
    }
}
```

```

        $query="INSERT INTO User_Info (Harris_ID, Fname, Lname,
Password, Email, Street, City, State, Zip, Gender, Age, Pref_Attrib, OS,
Browser, ModemSpeed, Login, Pur_Period, Pur_Type, Survey_Source, V_Brochure,
Date) ";
        $query = $query . "Values(";
        for ($index = 1; $index < 20; $index++) {
            $query = $query . "" . $i[$index] . ", ";
        }
        $query = $query . "'no', NOW()";
        mysql_query($query);

//        echo $query . "<br>";
        $query = "SELECT * FROM Reward_Redemption WHERE
Harris_ID=$i[1]";
        $result = mysql_query($query);
        if (mysql_numrows($result) == 0) {
            $query = "INSERT INTO Reward_Redemption (Harris_ID,
Pts_Earned, Earned_Amazon, Earned_Lottery, Proc_Amazon, Proc_Lottery, Fname,
Lname, Email) Values('$i[1]', 0, 0, 0, 0, 0, '$i[2]', '$i[3]', '$i[5]');";
            //        echo $query;
            mysql_query($query);
        }

        mysql_close();
    }
}

include "TopFrameLanding.php";
include "BottomFrameLanding.php";
?>

```

## ***Appendix II NewLandingContent.php Excerpt***

```

<form method="POST" action="LandingPage.php" id="Blogin">
    <span class="land_Descriptor">Choose a New User Name</span>
    <br><br>
    <span class="default_text">Before you can enter this site you must have a
valid user name. <b><? echo "$i[16]"; ?></b> is taken or invalid (User Names
must be unique and between 4-8 characters long).</span>
    <br>
    <br class="default_text">
    <center>
    <table border="0" width="auto">
    <tr class="default_text">
    <td width="50" class="default_text">User Name</td>
    <td width="50"><input type="text" name="Q1020" size="8"></td>
    <td><input type="submit" value="Submit" name="sub"></td>
    </tr>
    </table>
    <?
    echo "<input type = 'hidden' name='Q3' value = '$i[1]' >";
    echo "<input type = 'hidden' name='Q1000' value = '$i[2]' >";
    echo "<input type = 'hidden' name='Q1001' value = '$i[3]' >";
    echo "<input type = 'hidden' name='Q1025' value = '$i[4]' >";
    echo "<input type = 'hidden' name='Email' value = '$i[5]' >";
    echo "<input type = 'hidden' name='Q1002' value = '$i[6]' >";
    echo "<input type = 'hidden' name='Q1003' value = '$i[7]' >";
    echo "<input type = 'hidden' name='Q1004' value = '$i[8]' >";
    echo "<input type = 'hidden' name='Q1005' value = '$i[9]' >";
    echo "<input type = 'hidden' name='Q102' value = '$i[10]' >";
    echo "<input type = 'hidden' name='Q105' value = '$i[11]' >";
    echo "<input type = 'hidden' name='Q535' value = '$i[12]' >";
    echo "<input type = 'hidden' name='Q342' value = '$i[13]' >";
    echo "<input type = 'hidden' name='Q8' value = '$i[14]' >";
    echo "<input type = 'hidden' name='Q340' value = '$i[15]' >";

```

```

echo "<input type = 'hidden' name='Q465' value = '$i[17]' >";
echo "<input type = 'hidden' name='Q470' value = '$i[18]' >";
echo "<input type = 'hidden' name='Q360' value = '$i[19]' >";
echo '<input type = "hidden" name="Q305" value = "*d$q489x">';
?>

</center>
<br>
</form>

```

### **Appendix III**      **Blogin.php**

```

$Name = $_POST['Name'];
$pass = $_POST['pass'];
$enc_pass =md5($pass);
$user="webuser";
$password="1q2w3e";
$databse="MAA";
mysql_connect(localhost,$user,$password);
@mysql_select_db($database) or die( "Unable to select database");
$query="SELECT * FROM User_Info WHERE Login LIKE '$Name'";
$result = mysql_query($query);
$num_rows=mysql_numrows($result);
if ($num_rows != 1 || $pass != mysql_result($result,0,"Password")) {
    $relogin = 1;
} else {
    if (mysql_result($result,0,"Deactivated") == "1") {
        $relogin = 3;
    } else if (mysql_result($result,0,"Deactivated") == "2") {
        $relogin = 2;
    } else {
        $ID = mysql_result($result,0,"Harris_ID");
        $_SESSION['sessionNum'] = $sessionNum;
        $_SESSION['ID'] = $ID;
        $_SESSION['username'] = $Name;
        $_SESSION['name'] = mysql_result($result,0,"Fname") . " " .
mysql_result($result,0,"Lname");
        $_SESSION['userpassword'] = $pass;
        $_SESSION['pref'] = mysql_result($result,0,"Pref_Attrib");
        $_SESSION['viewed'] = mysql_result($result,0,"V_Brochure");
        $_SESSION['on'] = 1;
        $_SESSION['email'] = mysql_result($result,0, "Email");
        $_SESSION['login'] = "Broadband";

        srand(time());
        $sessionNum = (rand()%100000)+1;

        //promotion code
        $currttime = time();
        $enddate = strtotime("March 15, 2005 1:00 AM");
        if ($currttime <= $enddate) {
            $query = "SELECT * FROM `Sites_Visited` WHERE
Harris_ID = $ID AND Activity LIKE 'Logged into MAA during the March
promotion'";
            if(mysql_numrows(mysql_query($query)) == 0) {
                $query = "INSERT INTO Sites_Visited
(Harris_ID, Site, Points, Date, Activity) Values($ID, 'My Auto Advocate', 3,
NOW(), 'Logged into MAA during the March promotion')";
                mysql_query($query);
                $query = "UPDATE Reward_Redemption SET
Pts_Earned=Pts_Earned+3 WHERE Harris_ID=$ID";
                mysql_query($query);
            }
        }
        //end promotion code

```



```

        </td>
    </tr>
    <tr>
        <td></td>
    </tr>
    <tr>
        <td valign="top" width="312" class="default_text">
            <p>The New Vehicle Advisor that My Auto Advocate is linking to
            is called the "Auto Choice Advisor". This site searches over 250 different
            makes and models to help you identify which vehicles are right for you.
            Please click the &quot;Visit Now&quot; link above. <br>
            <br>
            <span class="location">The New Vehicle Advisor Helps
            You...</span><br>
            • Find the vehicle that fits your lifestyle<br>
            • <a href="ACA.php#recommend">Generate unbiased recommendations</a> not
            influenced by banner ads or other product promotions<br>
            • Narrow your focus and save time by responding to optional, easy-to-answer
            questions<br>
            • Get up-to-date product and pricing information<br>
            <br>
            <span class="location">Curious Why GM Provides This
            Advisor?</span><br>
            The reason is quite simple - by helping today's consumers choose specific sets
            of vehicles that best meet their individual preferences, priorities, and
            lifestyles we gain valuable insight into how we might better improve our own
            products. <a href="javascript:scroll(0,0)">Back&nbsp;to&nbsp;top</a></p>
            <p><a name="recommend"></a><span class="location">Generate
            Unbiased Recommendations</span><br>
            The data for the New Vehicle Advisor is provided by two independant
            organizations - the Auto Information Center (AIC) and J.D.Power. Unlike
            comparison shopping and/or review sites, this advisor does not require you to
            sift through large numbers of products that you may know nothing about. Instead,
            after answering a few simple questions, you receive a short, ranked list of
            recommended vehicles which you can then compare side by side in detail. You can
            also use the &quot;Your Garage&quot; feature to store your preferred vehicles
            and return to view or change them at any time. <a
            href="javascript:scroll(0,0)">Back&nbsp;to&nbsp;top</a></p>
            <td width="15">&nbsp;</td>
            <td width="1" bgcolor="#A7A7A7"></td>
            <td width="15">&nbsp;</td>
            <td valign="top" width=150 height="100%" class="default_text">
                <a href="http://www.autochoiceadvisor.com" class=a1
                target="_blank">
                    </a>
                    <span class="location">5 Reward Certificates</span><br>
                    Earn rewards by visiting the advisor, specifying what you
                    want in your next vehicle, and then asking the advisor to recommend vehicles
                    according to your needs. Your certificates will automatically show up in <a
                    href="MyRewards.php" target="_self">My Rewards</a> within 24 hours.
                    <br>
                    <br>
                    <a href="LaunchPage.php?Site=ACA" class=a1 target="_blank">> Visit Now
                </a><br>
                <a href="javascript:openRewards()" class=a1>> Rewards Information</a></td>
            </tr>
        </table>

```

```
<?php include 'Footer.php'; ?>
```

## Appendix V LaunchPage.php

```

<?php
session_start();
header("Cache-control: private");

if($_SESSION['on']) {

```



```

        $username = $_SESSION['username'];
        $SID = $_SESSION['ID'];
        $pass = $_SESSION['userpassword'];
        $cookie_exists = 1;
    }
    else {
        $cookie_exists = 0;
    }
}

$site = $_GET['Site'];

    if ($site == "ACA") {
        $display = "Auto Choice Advisor";
        $link = "http://dcrm.autochoiceadvisor.com?instance_id=CA$ID";
        $desc = "<b>Rewards</b><br><i>To earn your (5) Reward Certificates
please specify what you want in your next vehicle and then ask the advisor to
recommend vehicles according to your needs. Your certificates will automatically
show up in 'My Rewards'.</i>";
    }
    else if ($site == "ASIM") {
        $display = "Auto Show in Motion";
        $link = "http://www.autoshowinmotion.com/Register";
        $desc = "<b>Rewards</b><br><i>When you arrive at the AutoShow in
Motion registration web site select the event that you would like to attend by
clicking on the appropriate link. On the following screen choose 'General
Registration'. Remember to specify 'Harris' when asked 'How did you hear about
this event?'. Also, please let them know that you are from 'Harris' when you
attend to ensure that you receive your (20) Reward Certificates. Your
certificates will automatically show up in 'My Rewards' approximately 7-10 days
after the event.</i>";
    }
    else if ($site == "Communispace") {
        $display = "Driver Forum";
        $link = "https://driverforum.communispace.com";
        $desc = "";
    }

    else if ($site == "PG") {
        $display = "Proving Grounds";
        $link = "http://www.gmprovinggrounds.com?maa=$ID";
        $desc = "<b>Rewards</b><br><i>Earn (5) rewards by visiting the
Proving Grounds and experiencing (2) of the following features for at least (1)
vehicle: real driver testimonials, virtual test drives, and/or side by side
competitive specs. Visit by April 14th and receive an additional (5) reward
certificates as a bonus! Your certificates will automatically show up in My
Rewards within (24) hours.</i>";
    }

?>
<html xmlns="http://www.w3.org/1999/xhtml">

<head>

<title><? echo "$display"; ?> Launch Page</title>

<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />

<link href="main.css" rel="stylesheet" type="text/css" />

<style type="text/css">

<!--
body {
    background-color: #D0DCEA;
    margin-left: 0px;
    margin-right: 0px;
}

.style2 {
    color: #414636;
    font-size: 14px;
}

```

```

}

.style4 {
    color: #414636;
    font-size: 16px;
}

.style6 {
    color: #414636;
    font-size: 18px;
}

.style8 {color: #414636}

-->

</style>
<table cellPadding=0 cellSpacing=0 border=0 width="500" bgcolor="FFFFFF">
<tr bgColor=#6B7A8F style="BORDER-BOTTOM: #ffffff 1pt solid">
    <td class="whitetitle" height="30" colspan=4>&nbsp;&nbsp;&nbsp;&nbsp;<span
class="style1"><?php echo "$display"; ?></span></td>
</tr>
<tr>
    <td>&nbsp;&nbsp;&nbsp;</td>
    <td colspan="2" class="default_text"> <br>
You are about to visit a site that is external to My Auto Advocate and that may
have a different privacy policy.
    <?php
        if ($site == "Communispace") {
            echo ' Please click <a
href="Driver_Forum_CS_privacy_statement.pdf" target="_blank">Driver Forum
Privacy Statement</a> for details.<br><br>';
            echo '<FORM METHOD="POST"
ACTION="https://driverforum.communispace.com/login.asp?ACTION=validate">';
            echo "<INPUT NAME='membername' value='$username' TYPE='hidden' >";
            echo "<INPUT NAME='password' value='$pass' TYPE='hidden'>";
            echo "Click the button to visit the Driver Forum
now:&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;<INPUT VALUE='Continue' TYPE='SUBMIT'>";
            echo '</FORM>';
            echo 'By logging into the Driver Forum, you agree to the Driver
Forum Terms and Conditions summarized below. Please click <a
href="Terms_and_Conditions_for_Driver_Forum.pdf" target="_blank">Driver Forum
Terms and Conditions</a> for details.<br>';
        } else {
            echo " Please refer to the site's policy procedures if you have
any concerns.<br><br>To continue on to the external site, please click <a
href='$link'>$display</a>.<br><br>$desc";
        }
        $user="webuser";
        $password="1q2w3e";
        $database="MAA";
        mysql_connect(localhost,$user,$password);
        @mysql_select_db($database) or die( "Unable to select database");
        $query = "INSERT INTO Sites_Record (Harris_ID, Site, Date, Login)
Values ($ID, '$site', NOW(), '$username')";
        mysql_query($query);
        if ($site == "ACA") {
            $query="SELECT * FROM Sites_Visited WHERE Harris_ID=$ID AND
Activity LIKE 'Visited the New Vehicle Advisor'";
            $result = mysql_query($query);
            $check_there=mysql_numrows($result);
            if ($check_there == 0) {
                $query="INSERT INTO Sites_Visited (Harris_ID, Site, Points,
Date, Activity) Values ($ID, 'New Vehicle Advisor', 5, NOW(), 'Visited the New
Vehicle Advisor')";
                mysql_query($query);
                $query = "UPDATE Reward_Redemption SET
Pts_Earned=Pts_Earned+5 WHERE Harris_ID=$ID";
                mysql_query($query);
            } else {
                $query="INSERT INTO Repeat_ACA (Harris_ID, Date)
Values ($ID, NOW())";

```

```

        mysql_query($query);
    }
}
else if ($site == "PG") {
    $query="SELECT * FROM Sites_Visited WHERE Harris_ID=$ID AND
Activity LIKE 'Visited GM Proving Grounds'";
    $result = mysql_query($query);
    $check_there=mysql_numrows($result);
    if ($check_there == 0) {
        $query="INSERT INTO Sites_Visited (Harris_ID, Site, Points,
Date, Activity) Values ($ID, 'Proving Grounds', 10, NOW(), 'Visited GM Proving
Grounds')";
        mysql_query($query);
        $query = "UPDATE Reward_Redemption SET
Pts_Earned=Pts_Earned+10 WHERE Harris_ID=$ID";
        mysql_query($query);
    } else {
        $query="INSERT INTO Repeat_PG (Harris_ID, Date)
Values ($ID, NOW())";
        mysql_query($query);
    }
}
mysql_close();

?>
</td>
<td class="default_text">&nbsp;&nbsp;&nbsp;</td>
<tr>
<td>&nbsp;&nbsp;&nbsp;</td>
<td width="13" class="default_text"><br> </td>
<td width="465" class="default_text">
<?php if ($site == "Communispace") {
    echo "<br>• Only those who are members of the community may access
it.<br>";
    echo "• You must keep confidential all information that GM,
other community members,
and you share within the Driver Forum. <br>";
    echo "• GM has the right to use the ideas & information that
you put forth in the Driver Forum.<br>";
    echo "• You agree not to use behavior that does not support a
safe and comfortable environment for all members. <br>";
    echo "• You agree not to copy or download any GM copyrighted
material. <br>";
    echo "• GM does not endorse the information posted in the
Driver Forum. <br><br>";
}
?>
</td>
<td class="default_text">&nbsp;&nbsp;&nbsp;</td>
<tr><td width="9">&nbsp;&nbsp;&nbsp;</td>
</td>
<td colspan="2" class="default_text">
<?php if ($site == "Communispace") {
    echo "<b>Rewards</b><br><i>(5) Reward Certificates will
automatically be posted to your account within (7) business days following your
first login. You will also be able to earn up to (15) Reward Certificates for
ongoing participation in the Driver Forum. For each 30-day period starting at
the onset of the program, if you make three contributions to Driver Forum (i.e.,
completing a survey or posting to a discussion) according to online
instructions, you will receive (3) Reward Certificates. Your certificates will
automatically show up in My Rewards within (7) business days of each 30-day
period.</i><br><br>";
}
?>
NOTE: My Auto Advocate will remain open in another window while you are visiting
the external site. You can return to My Auto Advocate at any time by <a
href="javascript:window.close()">closing this window</a>. </td>
<td width="13" class="default_text">&nbsp;&nbsp;&nbsp;</td>
<tr><td width="9">&nbsp;&nbsp;&nbsp;</td>
</td></tr>
</table>

```

```
</html>
```

## **Appendix VI**      **MyRewards.php Listing Excerpt**

```
$user="webuser";
$password="1q2w3e";
$databse="MAA";
mysql_connect(localhost,$user,$password);
@mysql_select_db($databse) or die( "Unable to select database");
$query="INSERT INTO Pages_Visited (Harris_ID, Page, Time, SessionID)
Values($ID, '$title', NOW(), '$sessionNum');";
mysql_query($query);
$query="SELECT * FROM Sites_Visited WHERE Harris_ID=" . $_SESSION['ID'] .
";";
$result = mysql_query($query);
$num_rows=mysql_numrows($result);
if ($num_rows == 0) {
    echo "<tr><td colspan=3 align='center' bgcolor='#ffffff'>No rewards earned
at this time.</td></tr>";
} else {
    for ($i = 0; $i < $num_rows; $i++) {
        $points=mysql_result($result,$i,"Points");
        $activity=mysql_result($result,$i,"Activity");
        $date=mysql_result($result,$i,"Date");
        echo "<tr>";
        echo "<td bgcolor='#ffffff' class=\"default_text\">$points</td>";
        echo "<td bgcolor='#ffffff'
class=\"default_text\">$activity</td>";
        echo "<td bgcolor='#ffffff'
class=\"default_text\">$date</td></tr>";
    }
}

?>
</table>
```

## **Appendix VII**      **MyRewards.php, processCD eBooklet Excerpt**

The first set of code is from the middle of MyRewards.php. The next set of code comes from processCD which is called by MyRewards.

```
<?php
$query = "SELECT * FROM Sites_Visited WHERE Harris_ID=$ID AND Site='E-
booklet';";
$result = mysql_query($query);
$num_rows1=mysql_numrows($result);

$query="SELECT * FROM Ebooklet WHERE Harris_ID=$ID AND CD_Verif='No';";
$result = mysql_query($query);
$num_rows2=mysql_numrows($result);
if ($num_rows2 != 0 && $num_rows1 == 0) {
    echo '<form action="process_CD.php" method="POST">';
    echo "<span class='default_text'><br>A CD with the GM eBooklet has been
sent to you. In order to get the 5 reward certificate points you need to enter
the 3-digit code located on the CD cover.<br> <br>Please enter the code:
</span>";
    echo '<input type="text" size="3" name="CDnum" style="vertical-align:
middle;">';
    echo '<button value="submit" type=SUBMIT id="subCDButton"
style="vertical-align: middle;">Go</button>';
    echo "</form>";
}
?>
```

```

$cdnum = $_POST["CDnum"];
if ($cdnum == "ASA" || $cdnum == "asa") {
    $query="INSERT INTO Sites_Visited (Harris_ID, Site, Points, Date,
Activity) Values ($ID, 'E-booklet', 5, NOW(), 'Viewed the GM eBooklet');";
    mysql_query($query);
    $query = "UPDATE Reward_Redemption SET Pts_Earned=Pts_Earned+5
WHERE Harris_ID=$ID;";
    mysql_query($query);
    $query = "UPDATE Ebooklet SET CD_Verif='Yes' WHERE
Harris_ID='$ID'";
    mysql_query($query);

    //promotion code
    $query = "SELECT * FROM Ebooklet WHERE Harris_ID='$ID'";
    $result = mysql_query($query);
    $timeoforder = mysql_result($result, 0, "Date");
    $enddate = strtotime("March 15, 2005 1:00 AM");
    if ($timeoforder <= $enddate) {
        $query = "SELECT * FROM `Sites_Visited` WHERE Harris_ID =
SID AND Activity LIKE 'Viewed the GM eBooklet during a promotion'";
        if(mysql_numrows(mysql_query($query)) == 0) {
            $query = "INSERT INTO Sites_Visited (Harris_ID, Site,
Points, Date, Activity) Values($ID, 'E-booklet Promotion', 5, NOW(), 'Viewed the
GM eBooklet during a promotion');";
            mysql_query($query);
            $query = "UPDATE Reward_Redemption SET
Pts_Earned=Pts_Earned+5 WHERE Harris_ID=$ID;";
            mysql_query($query);
        }
    }
    //end promotion code

    $extraprint = "You have successfully typed in the correct key.
Your points have been registered.";
} else {
    $extraprint = "You typed in an invalid CD key. If $cdnum does
match the letters on your CD please contact <a
href='mailto:support@myautoadvocate.com'>support@myautoadvocate.com</a>";
}

```

## ***Appendix VIII MyRewards.php, process\_amazon Redemption Excerpts***

The first set of code comes at the end of MyRewards. The next set of code comes from process\_amazon which is called by My Rewards.

```

<table cellPadding=2 cellSpacing=2 border=0 bgcolor="#6B7A8F" width="511">
<tr>
<td colspan=5 align="center" class="whitetitle" class="default_text">
Your Rewards Redeemed </td>
</tr>
<tr>
<td bgcolor="#ffffff" class="default_text">Total # of Certificates</td>
<td bgcolor="#ffffff" class="default_text">Amazon Coupons Redeemed</td>
<td bgcolor="#ffffff" class="default_text">Sweepstakes Points
Redeemed</td>
</tr>
<?

    $query="SELECT * FROM Reward_Redemption WHERE Harris_ID=" . $_SESSION['ID'] .
";";
    $result = mysql_query($query);
    if (mysql_numrows($result) != 0) {
        $pts=mysql_result($result,0, "Pts_Earned");
        $sea=mysql_result($result,0, "Earned_Amazon");
        $sel=mysql_result($result,0, "Earned_Lottery");
        $pa=mysql_result($result,0, "Proc_Amazon");
        $pl=mysql_result($result,0, "Proc_Lottery");
    } else {

```

```

    $pts = 0; $sea = 0; $sel = 0; $spa = 0; $pl = 0;
}

    $tota = $sea + $pa;
    $totl = $sel + $pl;
    echo "<tr>";
        echo "<td bgcolor='#ffffff' class=\"default_text\">$pts</td>";
        echo "<td bgcolor='#ffffff' class=\"default_text\">\$tota";
/*    if ($pa != 0) echo "(processing \$spa)"; */
    echo "</td>";
    echo "<td bgcolor='#ffffff' class=\"default_text\">\$totl";
/*    if ($pa != 0) echo "(processing \$pl)"; */
    echo "</td></tr>";
?>

</table>
<b><br>
<form action="process_amazon.php" method="POST">
<table cellPadding=2 cellSpacing=2 border=0 bgcolor="#6B7A8F" width="511"
class="default_text">
<tr>
    <td colspan=4 align="center" class="whitetitle"
class="default_text">Redemption Center </td>
</tr>
<tr>
    <td bgcolor="#ffffff" class="default_text"># of Certificates
Available</td>
    <td bgcolor="#ffffff" class="default_text">Step 1: Amazon Coupons</td>
    <td bgcolor="#ffffff" class="default_text">Step 2: Sweepstakes
Points</td>
</tr>

<?
    $leftover = $pts - $tota - $totl;
    if ($leftover == 0)
        echo '<tr><td bgcolor="#ffffff" colspan=3 class="default_text"> You have
no points to redeem at this time </td></tr>';
        else {
            echo '<tr><td bgcolor="#ffffff" valign="top"
class="default_text">You currently have ' . $leftover . ' certificates
available</td><td bgcolor="#ffffff" class="default_text" valign="top">Choose the
amount of Amazon coupons: <br><br>$(SELECT id="Amazon" size="1" name="Amazon"
style="width:auto">';
            echo '<OPTION value="0" >Select</OPTION>';
            if ($tota + $leftover > 20)
                $leftover = 20 - $tota;

            for ($i = 0; $i <= $leftover; $i=$i+5) {
                echo "<OPTION value='$i'>$i</OPTION>";
            }

            echo '</SELECT> &nbsp; &nbsp;<button value="submit" type=SUBMIT
id="subButton">Go</button>';

            if ($leftover == 0) {
                echo "<br><br><b>You have earned the maximum amount of
Amazon coupons available. Please use all available certificates for Sweepstakes
points.</b>";
            }
            echo '</td><td bgcolor="#ffffff" class="default_text"
valign="top">Please choose the amount of amazon coupons
first.</td></tr></form>';

        }
    mysql_close();
}

    else echo "You do not have any rewards right now. Please sign up on My
Auto Advocate to view this site.";
?>
</table>
</form>

```

</p>

<?php include 'Footer.php'; ?>

---

```
<form action="process_rewards.php" method="POST">
<table cellPadding=2 cellSpacing=2 border=0 bgcolor="#6B7A8F" width="511">
<tr>
  <td colspan=4 align="center" class="whitetitle">Redemption Center </td>
</tr>
<tr>
  <td bgcolor="#ffffff" class="default_text"># of Certificates
  Available</td>
  <td bgcolor="#ffffff" class="default_text">Step 1: Amazon Coupons</td>
  <td bgcolor="#ffffff" class="default_text">Step 2: Lottery Tickets</td>
</tr>

<?
  $leftover = $pts - $tota - $totl;
  if ($leftover == 0)
    echo '<tr><td bgcolor="#ffffff" colspan=3 align="center"> You have no
points to redeem at this time </td></tr>';
  else {
    echo '<tr class="default_text"><td bgcolor="#ffffff" valign="top"
class="default_text">You currently have ' . $leftover . ' certificates
available</td>';
    echo '<td bgcolor="#ffffff" valign="top" class="default_text">You
have selected $ ' . $amazonwants . ' in Amazon coupons</td>';
    echo '<td bgcolor="#ffffff" valign="top"
class="default_text">Choose the amount of Lottery tickets: <br><br><SELECT
id="Lottery" size="1" name="Lottery" style="width:auto">';
    echo '<OPTION value="0" >Select</OPTION>';
    $leftover = $leftover - $amazonwants;
    for ($i = 0; $i <= $leftover; $i=$i+5) {
      echo "<OPTION value='$i'>$i</OPTION>";
    }
    if ($leftover % 5 != 0) {
      echo "<OPTION value='$leftover'>$leftover</OPTION>";
    }
    $tot_amazon_wants = $amazonwants + $pa;
    echo '</SELECT> &nbsp; &nbsp; <button type=SUBMIT
name="submit">Redeem</button>';
    echo "<input type=\"hidden\" name=\"Amazon\"
value=\"\$tot_amazon_wants\">";
    echo "<input type=\"hidden\" name=\"pl\"
value=\"\$pl\"></td></tr>";
  }
  mysql_close();
}
  else echo "You do not have any rewards right now. Please sign up on My
Auto Advocate to view this site.";
?>
</table>
</form>
```

## ***Appendix IX***      ***ShowResearch.php***

<?php

```
$ID = $_GET['ID'];
$Research = $_GET['Research'];
$sessionNum = $_GET['sessionNum'];

$user="webuser";
$password="1q2w3e";
$database="MAA";
mysql_connect(localhost,$user,$password);
```

```

@mysql_select_db($database) or die( "Unable to select database");

$query="INSERT INTO Research_Info (Harris_ID, Time, Site, SessionID) Values($ID,
NOW(), '$Research', '$sessionNum');";
mysql_query($query);

//echo $query;

header("Location: $Research"); /* Redirect browser */

/* Make sure that code below does not get executed when we redirect. */
exit;

?>

```

## ***Appendix X Brochures2KT.php***

```

<?php
session_start();
header("Cache-control: private");

if($_SESSION['on']) {
    $name = $_SESSION['name'];
    $ID = $_SESSION['ID'];
    $pref = $_SESSION['pref'];
    $viewed = $_SESSION['viewed'];
    $cookie_exists = 1;
}
else {
    include "LoginAgain.php";
    exit;
}

$title = "Brochures Page";
if ($_SESSION['login'] == "Broadband")
    $image = "GIFs/Ebook.gif";
else
    $image = "GIFs_4_Dial_UP/Ebook.gif";
$link = "Brochures2KT.php";
$target = "_self";
include 'Header.php';

if ($_SESSION['on']) {
    $user="webuser";
    $password="1q2w3e";
    $database="MAA";
    mysql_connect(localhost,$user,$password);
    @mysql_select_db($database) or die( "Unable to select database");
    $query="SELECT * FROM Ebooklet WHERE Harris_ID='$ID'";
    $result = mysql_query($query);
    $num_rows=mysql_numrows($result);
    if ($num_rows != 0) {
        if (mysql_result($result,0,"Module") != "") {
            include "Brochures_ShowAll.php";
            exit;
        }
    }
    include "Brochures_ShowFirst.php";
}

?>

```

## ***Appendix XI BrochuresCD.php and BrochuresCDYes.php Excerpts***

Here is the PHP/MySQL code snippet from BrochuresCD.php:



```

$user="webuser";
$password="1q2w3e";
$databse="MAA";
mysql_connect(localhost,$user,$password);
@mysql_select_db($databse) or die( "Unable to select database");
$query="SELECT * FROM Ebooklet WHERE Harris_ID='$ID'";
$result = mysql_query($query);
$num_rows=mysql_numrows($result);
if ($num_rows != 0 && (mysql_result($result, 0, "CD_Verif") != NULL)) {
    $viewed_already = 1;
}
$query="SELECT * FROM User_Info WHERE Harris_ID='$ID'";
$result = mysql_query($query);
$address1 = mysql_result($result, 0, "Street");
$address2 = mysql_result($result, 0, "City") . ", CA " .
mysql_result($result, 0, "Zip");

```

Here is the PHP/MySQL code from BrochuresCDYes.php

```

$user="webuser";
$password="1q2w3e";
$databse="MAA";
mysql_connect(localhost,$user,$password);
@mysql_select_db($databse) or die( "Unable to select database");
$query="SELECT * FROM Ebooklet WHERE Harris_ID='$ID'";
$result = mysql_query($query);
$num_rows=mysql_numrows($result);
if ($num_rows != 0) {
    if (mysql_result($result,0,"CD_Verif") == NULL) {
        $query = "UPDATE Ebooklet SET CD_Verif='No' WHERE Harris_ID='$ID'";
        mysql_query($query);
    } else
        $statement = "You have already ordered a CD. Please be patient with
the CD order. If you have any questions please contact <a
href='mailto:support@myautoadvocate.com'>support@myautoadvocate.com</a>";
    }
    else {
        $query="INSERT INTO Ebooklet (Harris_ID, Date, CD_Verif, PointsFor) Values
($ID, NOW(), 'No', 'CD')";
        mysql_query($query);
    }
}

```

## Appendix XII DBinfo.php Excerpt

```

<?
    echo '<form action="DBinfo.php" method="POST">';
    echo "<span class='default_text'><br><br>View an archived version of this
page: &nbsp;&nbsp;&nbsp;</span>";
    echo '<SELECT id="enddate" size="1" name="enddate" style="width:auto">';
    echo '<OPTION value="0" >Select</OPTION>';
    echo '<OPTION value = "Now">NOW</OPTION>';
    $newvalue = strtotime("now");
    for ($index = 0; $newvalue > 1105483265; $index++) {
        $newvalue = strtotime("-$index day");
        $display = date("l dS of F Y", $newvalue);
        echo "<OPTION value = '$newvalue'>$display</OPTION>";
    }

    echo '</SELECT> &nbsp;&nbsp;&nbsp;<button value="submit" type=SUBMIT
id="subButton" style="vertical-align: middle;">Go</button>';
    echo "</form>";
?>
    <table cellPadding=2 cellSpacing=2 width="780" border=1
bordercolor="#DDDDDD">
<?php

```

```

if (!empty($_POST['enddate']) && $_POST["enddate"] != "Now") {
    $enddatenum = $_POST["enddate"];
    $enddate = date("Y-m-d H:i:s", $enddatenum);
} else {
    $enddate = date("Y-m-d H:i:s");
}

echo "<br><br>This data is through $enddate. If you wish to choose a
different end date please use the menu item above. NOTE: Redemption information
is only valid for current date.<br><br>";

$user="webuser";
$password="1q2w3e";
$databse="MAA";
mysql_connect(localhost,$user,$password);
@mysql_select_db($databse) or die( "Unable to select database");

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br>User data
</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT * FROM `Login_Info` WHERE Time < '$enddate'";
$result = mysql_query($query);
$val1 = mysql_numrows($result) - 1;
/* echo "<tr><td>Total logins ASC</td><td>$val1</td><td></td></tr>"; */

$query="SELECT * FROM `User_Info` WHERE Date > '2005-01-11 17:09:55' AND Date
< '$enddate' AND Deactivated=0;";
$result = mysql_query($query);
$tot = mysql_numrows($result)-1;
echo "<tr><td>Total users ASC</td><td>$tot</td><td></td></tr>";

$query="SELECT * FROM `User_Info` WHERE Date < '$enddate' AND
Deactivated=0;";
$result = mysql_query($query);
$totalusers = mysql_numrows($result);
echo "<tr><td>Total users</td><td>$totalusers</td><td></td></tr>";

/* $query = "SELECT DISTINCTROW User_Info.Harris_ID FROM User_Info LEFT JOIN
Ebooklet ON User_Info.Harris_ID = Ebooklet.Harris_ID LEFT JOIN DF_Signup ON
DF_Signup.Harris_ID = User_Info.Harris_ID LEFT JOIN Sites_Record ON
Sites_Record.Harris_ID = User_Info.Harris_ID LEFT JOIN Sites_Visited ON
Sites_Visited.Harris_ID = User_Info.Harris_ID LEFT JOIN Login_Info ON
Login_Info.Harris_ID = User_Info.Harris_ID WHERE (User_Info.Date LIKE '0000-00-
00 00:00:00') AND (DF_Signup.Harris_ID IS NOT NULL OR Ebooklet.Harris_ID IS NOT
NULL OR Sites_Visited.Harris_ID IS NOT NULL OR Sites_Record.Harris_ID IS NOT
NULL OR Login_Info.Harris_ID IS NOT NULL);";
$result = mysql_query($query);
$val = mysql_numrows($result)-1;
echo "<tr><td>Users before script change (BSC) who went to ACA/Ebooklet/DF -
not ASIM or logged in ASC</td><td>$val</td><td>" . substr(100
*$val/($totalusers-$tot), 0, 5). "% of users BSC</td></tr>"; */

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br>Ebooklet data
</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT * FROM `Ebooklet` WHERE Date < '$enddate'";
$result = mysql_query($query);
$numtotalebooks = mysql_numrows($result);
echo "<tr><td>GM Ebooklets users (total) </td><td>$numtotalebooks</td><td>" .
substr(100 *$numtotalebooks/$totalusers, 0, 5). "% of total users</td></tr>";

```

```

$query="SELECT DISTINCTROW Harris_ID FROM Sites_Visited WHERE Site='E-
booklet' AND Date < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>GM Ebooklet point earners (total) </td><td>$val</td><td>" .
substr(100 *$val/$totalusers, 0, 5). "% of total users</td></tr>";

$query="SELECT * FROM `Ebooklet` WHERE PointsFor='Download' AND Date <
'$enddate';";
$result = mysql_query($query);
$numdownloadebooks = mysql_numrows($result);
echo "<tr><td>Ebooklets downloaded</td><td>$numdownloadebooks</td><td>" .
substr(100 *$numdownloadebooks/$numtotalears, 0, 5). "% of total
eBooklets</td></tr>";

$query="SELECT * FROM `Ebooklet` WHERE CD_Verif='No' OR CD_Verif='Yes' AND
Date < '$enddate';";
$result = mysql_query($query);
$value = mysql_numrows($result);
echo "<tr><td>Ebooklets ordered (CDs)</td><td>$value</td><td>" . substr(100
*$value/$numtotalears, 0, 5). "% of total eBooklets</td></tr>";

$query="SELECT * FROM `Ebooklet` WHERE CD_Verif='Yes' AND Date <
'$enddate';";
$result = mysql_query($query);
$value = mysql_numrows($result);
echo "<tr><td>Ebooklets ordered (CDs)
<b>confirmed</b></td><td>$value</td><td>" . substr(100 *$value/$numtotalears,
0, 5). "% of total eBooklets</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE
`Page`='Brochures Page' AND Time < '$enddate';";
$result = mysql_query($query);
$pageBroch = mysql_numrows($result);
echo "<tr><td>Brochures Page viewers ASC</td><td>$pageBroch</td><td>" .
substr(100 *$pageBroch/$tot, 0, 5). "% of users ASC</td></tr>";

$query="SELECT * FROM Ebooklet WHERE Date > '2005-01-11 17:09:55' AND Date <
'$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>GM Ebooklet users ASC</td><td>$val</td><td>" . substr(100
*$val/$pageBroch, 0, 5). "% of users who viewed Brochures page</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Brochure_Info` WHERE Time <
'$enddate';";
$result = mysql_query($query);
$numBroch = mysql_numrows($result);
echo "<tr><td>PDF Brochure users ASC</td><td>$numBroch</td><td>" . substr(100
*$numBroch/$tot, 0, 5). "% of users ASC</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Brochure_Info` WHERE Time <
'$enddate' AND (Brochure LIKE '%gm.com%' OR Brochure LIKE '%buick%');";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td><b>GM</b> PDF Brochure users ASC </td><td>$val</td><td>" .
substr(100 *$val/$tot, 0, 5). "% of users ASC</td></tr>";

$query="select DISTINCT Ebooklet.Harris_ID from Ebooklet LEFT JOIN
Brochure_Info ON Ebooklet.Harris_ID = Brochure_Info.Harris_ID WHERE
Brochure_Info.Time < '$enddate' AND Ebooklet.Date < '$enddate' AND
(Brochure_Info.Brochure LIKE '%gm.com%' OR Brochure_Info.Brochure LIKE
'%buick%')";
$result = mysql_query($query);
$numoverlap = mysql_numrows($result);
$overallGM = $numtotalears+$val-$numoverlap;
echo "<tr><td>Total <b>GM</b> brochure users (PDF and Ebooklet)
</td><td>$overallGM</td><td>" . substr(100 *$overallGM/$tot, 0, 5). "% of users
ASC</td></tr>";

echo "<tr height=40></tr>";

```

```

echo "<tr><td colspan = 4 align=center class='bl_header'><br> Discussion
Forum data </td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT * FROM `DF_Signup` WHERE Date < '$enddate';";
$result = mysql_query($query);
$DFsignups = mysql_numrows($result);
echo "<tr><td>Discussion Forum sign ups (total)</td><td>$DFsignups</td><td>"
. substr(100 *$DFsignups/$totalusers, 0, 5). "% of total users</td></tr>";

$query="SELECT * FROM `Sites_Visited` WHERE Activity LIKE 'Signed up for the
Discussion Forum' AND Date < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Discussion Forum <b>processed (signed up and logged in)</b>
sign ups (total)</td><td>$val</td><td>" . substr(100 *$val/$DFsignups, 0, 5). "%
of sign ups</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE `Page`='My
Community page' AND Time < '$enddate';";
$result = mysql_query($query);
$pageDF = mysql_numrows($result);
echo "<tr><td>Discussion Forum page viewers ASC</td><td>$pageDF</td><td>"
. substr(100 *$pageDF/$tot, 0, 5). "% of users ASC</td></tr>";

$query="SELECT * FROM `DF_Signup` WHERE Date > '2005-01-11 17:09:55' AND Date
< '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Discussion Forum sign ups ASC</td><td>$val</td><td>"
. substr(100 *$val/$pageDF, 0, 5). "% of users who viewed the Disc. Forum
page</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> ACA data
</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Sites_Visited` WHERE Site='New
Vehicle Advisor' AND Date < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>ACA users (total)</td><td>$val</td><td>" . substr(100
*$val/$totalusers, 0, 5). "% of total users</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE `Page`='Auto
Choice Advisor' AND Time < '$enddate';";
$result = mysql_query($query);
$pageACA = mysql_numrows($result);
echo "<tr><td>New Vehicle Advisor page viewers ASC</td><td>$pageACA</td><td>"
. substr(100 *$pageACA/$tot, 0, 5). "% of users ASC</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Sites_Visited` WHERE Site='New
Vehicle Advisor' AND Date > '2005-01-11 17:09:55' AND Date < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>ACA users ASC</td><td>$val</td><td>" . substr(100
*$val/$pageACA, 0, 5). "% of users who viewed the New Vehicle Advisor
page</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> ASIM
data</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE `Page`='Auto
Show In Motion' AND Time < '$enddate';";

```

```

$result = mysql_query($query);
$pageASIM = mysql_numrows($result);
echo "<tr><td>ASIM page viewers ASC</td><td>$pageASIM</td><td>" . substr(100
*$pageASIM/$tot, 0, 5). "% of users ASC</td></tr>";
$query = "SELECT DISTINCT Harris_ID FROM `Sites_Record` WHERE `Site`='ASIM'
AND Date > '2005-01-11 17:09:55' AND Date < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>ASIM website viewers ASC</td><td>$val</td><td>" . substr(100
*$val/$pageASIM, 0, 5). "% of users who viewed the ASIM page</td></tr>";

$query = "SELECT * FROM Sites_Visited WHERE Site LIKE 'ASIM%';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>ASIM users who have been credited for
points</td><td>$val</td><td>" . substr(100 *$val/$totalusers, 0, 5). "% of users
who viewed the ASIM page</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> GM Proving
Grounds data </td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT * FROM `Sites_Visited` WHERE Site LIKE 'Proving Grounds';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>GM Proving Grounds visits</td><td>$val</td><td>" . substr(100
*$val/$totalusers, 0, 5). "% of total users</td></tr>";

$query="SELECT * FROM `Sites_Visited` WHERE Site LIKE 'Proving Grounds' AND
Date > '2005-03-31 23:59:59' AND Date < '2005-04-14 23:59:59';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>GM Proving Grounds visits during the April
promotion</td><td>$val</td><td>" . substr(100 *$val/$totalusers, 0, 5). "% of
total users</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE `Page` LIKE
'Proving Grounds page' AND Time < '$enddate';";
$result = mysql_query($query);
$pagePG = mysql_numrows($result);
echo "<tr><td>GM Proving Grounds page viewers</td><td>$pagePG</td><td>" .
substr(100 *$pagePG/$totalusers, 0, 5). "% of users</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> March/April
Promotion data </td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT * FROM `Sites_Visited` WHERE Date < '$enddate' AND Activity
LIKE 'Logged into MAA during the March promotion';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Logged into MAA during the March
promotion</td><td>$val</td><td>" . substr(100 *$val/$totalusers, 0, 5). "% of
total users</td></tr>";

$query="SELECT * FROM `Sites_Visited` WHERE Date < '$enddate' AND Activity
LIKE 'Viewed the GM eBooklet' AND Date > '2005-02-28 23:59:59';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Viewed the GM eBooklet during the March
promotion</td><td>$val</td><td>" . substr(100 *$val/$totalusers, 0, 5). "% of
total users</td></tr>";

$query="SELECT * FROM `Login_Info` WHERE Time < '$enddate' AND Time > '2005-
03-31 23:59:59' AND Time < '2005-04-14 23:59:59';";
$result = mysql_query($query);
$val = mysql_numrows($result);

```

```

echo "<tr><td>Logged into MAA during the April
promotion</td><td>$val</td><td>" . substr(100 *$val/$totalusers, 0, 5). "% of
total users</td></tr>";

echo "<tr height=40></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> Treatment data
</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Sites_Visited` WHERE Site LIKE
'%ASIM%' OR Site LIKE '%E-booklet%' OR Site LIKE 'New Vehicle Advisor' OR Site
LIKE '%Discussion%';";
$result = mysql_query($query);
$one_treat = mysql_numrows($result);
echo "<tr><td># of Participants who have viewed at least 1
treatment</td><td>$one_treat</td><td>" . substr(100 *$one_treat/$totalusers, 0,
5). "% of total users</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> Other data
</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `CarSpecInfo` WHERE Time <
'$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Car Spec users ASC</td><td>$val</td><td>" . substr(100
*$val/$tot, 0, 5). "% of users ASC</td></tr>";

$query="SELECT DISTINCT Harris_ID FROM `Research_Info` WHERE Time <
'$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>Research users ASC</td><td>$val</td><td>" . substr(100
*$val/$tot, 0, 5). "% of users ASC</td></tr>";

$query = "SELECT DISTINCT Harris_ID FROM `Pages_Visited` WHERE `Page`='My
Rewards page' AND Time < '$enddate';";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "<tr><td>My Rewards page viewers ASC</td><td>$val</td><td>" . substr(100
*$val/$tot, 0, 5). "% of users ASC</td></tr>";

echo "<tr height=40></tr>";
echo "<tr><td colspan = 4 align=center class='bl_header'><br> Reward
Certificates Information</td></tr>";
echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

$totalpts = 0;
for ($pts = 5; $pts <= 100; $pts =$pts+5) {
    $lower = $pts -4;
    $query = "SELECT * FROM `Reward_Redemption` WHERE `Pts_Earned` <=$pts
AND Pts_Earned >= $lower";
    $result = mysql_query($query);
    $val = mysql_numrows($result);
    $totalpts += $val;
    echo "<tr><td>Users who have earned between $lower and $pts
points</td><td> $val</td><td>" . substr(100 * $val/$totalusers, 0, 5) . "% of
total users</td></tr>";
}
$val = $totalusers - $totalpts;

```

```

    echo "<tr><td>Users who have earned <b>no points</b></td><td> $val</td><td>"
    . substr(100 * $val/$totalusers, 0, 5) . "% of total users</td></tr>";

    echo "<tr height=40></tr>";
    echo "<tr><td colspan = 4 align=center class='bl_header'><br> Opt-in vs. Non
Opt-in Treatment Sign Ups</td></tr>";
    echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

    $query = "SELECT * FROM User_Info WHERE Survey_Source='1' AND Date <
'$enddate'";
    $result = mysql_query($query);
    $stotoi = mysql_numrows($result);
    echo "<tr><td>Opt-in users</td><td> $stotoi</td><td>" . substr(100 *
$stotoi/$totalusers, 0, 5) . "% of total users</td></tr>";

    $query = "SELECT * FROM User_Info WHERE Survey_Source='2' AND Date <
'$enddate'";
    $result = mysql_query($query);
    $stotnoi = mysql_numrows($result);
    echo "<tr><td>Non opt-in users</td><td> $stotnoi</td><td>" . substr(100 *
$stotnoi/$totalusers, 0, 5) . "% of total users</td></tr>";

    $query = "SELECT DISTINCTROW Login_Info.Harris_ID FROM Login_Info LEFT JOIN
User_Info ON User_Info.Harris_ID = Login_Info.Harris_ID WHERE
User_Info.Survey_Source='1' AND User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);
    echo "<tr><td>Opt-in users who logged in</td><td> $sval</td><td>" . substr(100
* $sval/$stotoi, 0, 5) . "% of Opt-in users</td></tr>";
    $query = "SELECT DISTINCTROW Login_Info.Harris_ID FROM Login_Info LEFT JOIN
User_Info ON User_Info.Harris_ID = Login_Info.Harris_ID WHERE
User_Info.Survey_Source='2' AND User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);
    echo "<tr><td>Non Opt-in users who logged in</td><td> $sval</td><td>" .
substr(100 * $sval/$stotnoi, 0, 5) . "% of Non Opt-in users</td></tr>";

    $query = "SELECT DISTINCTROW Sites_Visited.Harris_ID FROM Sites_Visited LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Visited.Harris_ID WHERE
User_Info.Survey_Source='1' AND Sites_Visited.Site='New Vehicle Advisor' AND
User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);
    echo "<tr><td>Opt-in users who visited ACA</td><td> $sval</td><td>" .
substr(100 * $sval/$stotoi, 0, 5) . "% of Opt-in users</td></tr>";
    $query = "SELECT DISTINCTROW Sites_Visited.Harris_ID FROM Sites_Visited LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Visited.Harris_ID WHERE
User_Info.Survey_Source='2' AND Sites_Visited.Site='New Vehicle Advisor' AND
User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);
    echo "<tr><td>Non Opt-in users who visited ACA</td><td> $sval</td><td>" .
substr(100 * $sval/$stotnoi, 0, 5) . "% of Non Opt-in users</td></tr>";

    $query = "SELECT DISTINCTROW Sites_Visited.Harris_ID FROM Sites_Visited LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Visited.Harris_ID WHERE
User_Info.Survey_Source='1' AND Sites_Visited.Site='E-booklet' AND
User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);
    echo "<tr><td>Opt-in users who earned GM E-booklet points</td><td>
$sval</td><td>" . substr(100 * $sval/$stotoi, 0, 5) . "% of Opt-in
users</td></tr>";

    $query = "SELECT DISTINCTROW Sites_Visited.Harris_ID FROM Sites_Visited LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Visited.Harris_ID WHERE
User_Info.Survey_Source='2' AND Sites_Visited.Site='E-booklet' AND
User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $sval = mysql_numrows($result);

```

```

    echo "<tr><td>Non Opt-in users who earned GM E-booklet points</td><td>
$val</td><td>" . substr(100 * $val/$totnoi, 0, 5) . "% of Non Opt-in
users</td></tr>";

    $query = "SELECT DISTINCTROW DF_Signup.Harris_ID FROM DF_Signup LEFT JOIN
User_Info ON User_Info.Harris_ID = DF_Signup.Harris_ID WHERE
User_Info.Survey_Source='1' AND User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $val = mysql_numrows($result);
    echo "<tr><td>Opt-in users who signed up for DF</td><td> $val</td><td>" .
substr(100 * $val/$totnoi, 0, 5) . "% of Opt-in users</td></tr>";

    $query = "SELECT DISTINCTROW DF_Signup.Harris_ID FROM DF_Signup LEFT JOIN
User_Info ON User_Info.Harris_ID = DF_Signup.Harris_ID WHERE
User_Info.Survey_Source='2' AND User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $val = mysql_numrows($result);
    echo "<tr><td>Non Opt-in users who signed up for DF</td><td> $val</td><td>" .
substr(100 * $val/$totnoi, 0, 5) . "% of Non Opt-in users</td></tr>";

    $query = "SELECT DISTINCTROW Sites_Record.Harris_ID FROM Sites_Record LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Record.Harris_ID WHERE
User_Info.Survey_Source='1' AND `Site`='ASIM' AND User_Info.Date <
'$enddate'";
    $result = mysql_query($query);
    $val = mysql_numrows($result);
    echo "<tr><td>Opt-in users who went to ASIM website</td><td> $val</td><td>" .
substr(100 * $val/$totnoi, 0, 5) . "% of Opt-in users</td></tr>";

    $query = "SELECT DISTINCTROW Sites_Record.Harris_ID FROM Sites_Record LEFT
JOIN User_Info ON User_Info.Harris_ID = Sites_Record.Harris_ID WHERE
User_Info.Survey_Source='2' AND `Site`='ASIM' AND User_Info.Date < '$enddate'";
    $result = mysql_query($query);
    $val = mysql_numrows($result);
    echo "<tr><td>Non Opt-in users who went to ASIM website</td><td>
$val</td><td>" . substr(100 * $val/$totnoi, 0, 5) . "% of Non Opt-in
users</td></tr>";

    $names = array('Within one month', '1 - 3 months', '4 - 6 months', '7 - 12
months', 'Over 1 year but less than 2 years', '2 years but less than 3 years',
'3 years but less than 4 years', '4 years or more', 'Do not plan to
purchase/lease another vehicle');

    echo "<tr height=40></tr>";
    echo "<tr><td colspan = 4 align=center class='bl_header'><br> Opt-in vs. Non
Opt-in Purchase Intent</td></tr>";
    echo "<tr><td>Stat</td><td># of <b>Unique</b> Users</td><td>Important
%'s</td></tr>";

    for ($index = 1; $index < 10; $index++) {
        $query = "SELECT DISTINCTROW Harris_ID FROM User_Info WHERE
Survey_Source='1' AND Pur_Period = '$index' AND Date < '$enddate'";
        $result = mysql_query($query);
        $val = mysql_numrows($result);
        $name = $names[$index-1];
        echo "<tr><td>Opt-in users: $name</td><td> $val</td><td>" .
substr(100 * $val/$totnoi, 0, 5) . "% of Opt-in users</td></tr>";

        $query = "SELECT DISTINCTROW Harris_ID FROM User_Info WHERE
Survey_Source='2' AND Pur_Period = '$index' AND Date < '$enddate'";
        $result = mysql_query($query);
        $val = mysql_numrows($result);
        echo "<tr><td>Non Opt-in users: $name</td><td> $val</td><td>" .
substr(100 * $val/$totnoi, 0, 5) . "% of Non Opt-in users</td></tr>";
    }

?>
</table><br>

```



```

<?
$query = "SELECT * FROM `Pages_Visited`";
$result = mysql_query($query);
$val = mysql_numrows($result);
echo "Average pages visited per session: " . substr($val/$vall, 0, 4) .
"<br>";
echo "Average pages visited per user: " . substr($val/$tot, 0, 4) . "<br>";

$query="SELECT * FROM `Login_Info` WHERE `Connection`='Broadband'";
$result = mysql_query($query);
$val2 = mysql_numrows($result);
echo "% of total logins that were broadband: " . substr(100*$val2/$vall, 0,
5) . "%<br>";

?>

```

### Appendix XIII Output.php Excerpt

```

$query="SELECT t1.Harris_ID, t1.Zip, t1.Gender, t1.Age, t1.Pref_Attrib, t1.OS,
t1.Browser, t1.ModemSpeed, t1.Date, t1.Pur_Period, t1.Pur_Type,
t1.Survey_Source, t2.Pts_Earned, t2.Earned_Amazon, t2.Earned_Lottery, t3.Date,
t3.PointsFor, t4.Date FROM User_Info AS t1 LEFT JOIN Reward_Redemption AS t2 ON
t1.Harris_ID = t2.Harris_ID LEFT JOIN Ebooklet AS t3 ON t1.Harris_ID =
t3.Harris_ID LEFT JOIN Sites_Visited AS t4 ON t1.Harris_ID = t4.Harris_ID AND
t4.Site LIKE 'New Vehicle Advisor' WHERE t1.Deactivated=0 ORDER BY `Harris_ID`
ASC";
$result = mysql_query($query);

$filename = '/var/www/html/Output/output_test.csv';
$fp = fopen($filename, "w");

$output = "Harris ID, Zip Code, Gender, Age, Pref. Attribute, Operating
System, Browser, Internet Speed, Time Stamp (joined), Purchase Period, Purchase
Type, Survey Source, Points Earned, Amazon Points Earned, Lottery Points Earned,
Ebooklet (first time) Timestamp, Ebooklet CD (1)/DL (2), ACA (first time)
Timestamp";

$output = $output . ", # of My Rewards visits, ACA Timestamp (last time),
Ebooklet Timestamp (last time), GM Broch Timestamp, non-GM Broch Timestamp";
$output = $output . ", Amzn Redeem Date 1, Amzn Redeem Amnt 1, Amzn
Redeem Date 2, Amzn Redeem Amnt 2, Amzn Redeem Date 3, Amzn Redeem Amnt 3, Amzn
Redeem Date 4, Amzn Redeem Amnt 4, Amzn Redeem Date 5, Amzn Redeem Amnt 5, ASIM
(1=ElToro 2=Inglewood 3=Pomona 4=San Diego)";
$output = $output . ", Car 1, Car 2, Car 3, Car 4, Car 5, Car 6, Car 7,
Car 8\n";
fputs($fp, $output);

echo $output <br>;
while ($myrow = mysql_fetch_row($result)) {
    $ID = $myrow[0];

    $myrewardsquery = "SELECT * FROM Pages_Visited WHERE Page LIKE 'My
Rewards Page' AND Harris_ID = $ID";
    $r1 = mysql_query($myrewardsquery);
    $v1 = mysql_numrows($r1);
    $repeatACA = "SELECT Date FROM Repeat_ACA WHERE Harris_ID = $ID";
    $r2 = mysql_query($repeatACA);
    $num_rows = mysql_numrows($r2);
    if ($numrows > 0)
        $v2 = strtotime(mysql_result($r2, $numrows - 1, "Date"));
    else $v2 = 0;
    $repeatEbooklet = "SELECT Date FROM Repeat_Ebooklet WHERE
Harris_ID = $ID";
    $r3 = mysql_query($repeatEbooklet);
    $num_rows = mysql_numrows($r3);
    if ($numrows > 0)
        $v3 = strtotime(mysql_result($r3, $numrows - 1, "Date"));
    else $v3 = 0;

```

```

$brochGM = "SELECT Time FROM `Brochure_Info` WHERE Harris_ID = $ID
AND (Brochure LIKE '%gm.com%' OR Brochure LIKE '%buick%');";
$r4 = mysql_query($brochGM);
$num_rows = mysql_numrows($r4);
if ($numrows > 0)
    $v4 = strtotime(mysql_result($r2, 0,"Time"));
    else $v4 = 0;
$brochnonGM = "SELECT Time FROM `Brochure_Info` WHERE Harris_ID =
SID AND (Brochure NOT LIKE '%gm.com%' AND Brochure NOT LIKE '%buick%');";
$r5 = mysql_query($brochnonGM);
$num_rows = mysql_numrows($r5);
if ($numrows > 0)
    $v5 = strtotime(mysql_result($r2, 0,"Time"));
    else $v5 = 0;
$redemption = "SELECT Issued, Value FROM `Fulfillments 3-11-05`
WHERE `Harris_ID` LIKE '$ID'";
$r6 = mysql_query($redemption);
$v6 = "";
$countner = 0;
while ($r6row = mysql_fetch_row($r6)) {
    $Issued = $r6row[0];
    $Value = $r6row[1];
    $v6 = $v6 . "$Issued, $Value";
    if ($countner < 4)
        $v6 = $v6 . ", ";
    $countner++;
}
for ($i = $countner; $i < 5; $i++) {
    $v6 = $v6 . "0, 0";
    if ($i < 4)
        $v6 = $v6 . ", ";
}

$ASIM = "SELECT Site FROM `Sites_Visited` WHERE `Harris_ID` = $ID
AND Activity LIKE '%ASIM%'";
$r7 = mysql_query($redemption);
$num_rows = mysql_numrows($r7);
if ($numrows > 0) {
    $v7 = strtotime(mysql_result($r7, 0,"Site"));
    if ($v7 == "ASIM - El Toro")
        $v7 = 1;
    else if ($v7 == "ASIM - Inglewood")
        $v7 = 2;
    else if ($v7 == "ASIM - Pomona")
        $v7 = 3;
    else if ($v7 == "ASIM - San Diego")
        $v7 = 4;
}
else $v7 = 0;

$ACAdata = "SELECT * from `sess-data` WHERE `InstanceID:` LIKE
'CA$ID'";
$rACA = mysql_query($ACAdata);
$out = "";
if (mysql_numrows($rACA) > 0) {
    echo "ACA DATA exists for $ID<br>";
    $vACA = mysql_fetch_row($rACA);
    $sessID = $vACA[0];

    $out = "";
    $vehData = "SELECT * from `veh-data` WHERE sessionid =
'$sessID'";

    $rVEH = mysql_query($vehData);
    if (mysql_numrows($rVEH) > 0) {
        $vVEH = mysql_fetch_row($rVEH);
        for ($j = 7; $j < 47; $j=$j+5) {
            $item = $vVEH[$j];
            $out = $out . "$item, ";
        }
    }
    else {

```

```

        for ($j = 0; $j < 8 ; $j++) {
            $out = $out . "0, ";
        }
    } else {
        for ($j = 0; $j < 8; $j++) {
            $out = $out . "0, ";
        }
    }
    $output = "";
    for ($i = 0; $i < 18; $i++) {
        $item = $myrow[$i];
        if ($item == "#NULL!" || $item == "")
            $item = "0";
        else if ($item == "Download")
            $item = "2";
        else if ($item == "CD")
            $item = "1";
        else if ($i == 8 || $i == 15 || $i == 17) {
            $item = strtotime($item);
        }
        $output = $output . "$item,";
    }
    $output = $output . "$v1, $v2, $v3, $v4, $v5, $v6, $v7, ";
    $output = $output . $out;
    $output = $output . "\n";
    fputs($fp, $output);
}
fclose($fp);
?>

```

## **Appendix XIV    *Digitas Opt-In Ad***

**Reward for getting  
the information you need.**

Reward points for up to **\$20** in Amazon gift certificates.  
And a chance to win a new Cadillac Escalade.

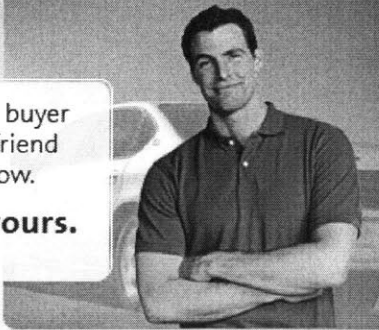
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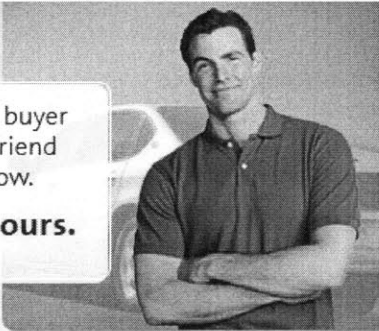


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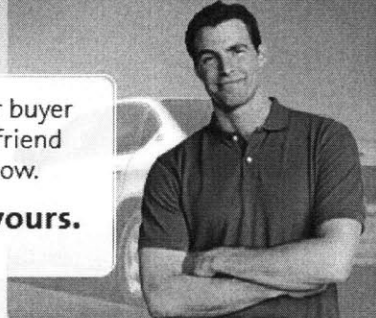
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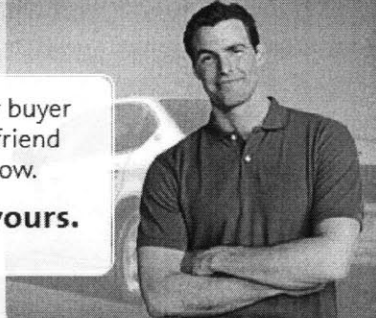


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