RESEARCH ARTICLE

TRENDS IN AN ONLINE AUTOMOBILE MARKET

Mutiat A. OGUNRINDE, Raheem A. Azeez, Maryam O. JIMOH
bogunrinde@gamil.com,   ajeazeez@gmail.com,   jimoh.maryam@yahoo.com
Mathematical and Computer Sciences Dept, Fountain University, P.M.B 4491 Oke Osun, Osogbo, Osun State.

Abstract:
Over the course of the 20th century, the automobile rapidly developed from an expensive toy for the rich into the de facto standard for passenger transport in most developed. In developing countries, the effects of the automobile have lagged, but are emulating the impacts of developed nations. The development of the automobile built upon the transport revolution started by railways, and like the railways, introduced sweeping changes in employment patterns, social interactions, and infrastructure and goods distribution. A car dealership or vehicle local distribution is a business that sells new or used cars at the retail level, based on a dealership contract with an automaker or its sales subsidiary.

This work is aimed at the development of an Online Automobile Market to allow interested car purchasers order for vehicle through the use of the internet so as to replace the hitherto manual system of vehicle purchasing currently being practiced in the country today. It also provides adequate, robust pricing information for each vehicle item displayed for sale. PHP with HTML technologies was employed in developing the front end with the client side of the system, which made the system fast, flexible and scalable, the database was created using MYSQL. Therefore it saves customers' time and effort by enabling easy navigation round the website.

Key Words: Automobile market, car dealership, Product catalog.

1. Introduction

Over the course of the 20th century, the automobile rapidly developed from an expensive toy for the rich into the de facto standard for passenger transport in most developed countries (Urrey, 2004). In developing countries, the effects of the automobile have lagged, but are emulating the impacts of developed nations. The development of the automobile built upon the transport revolution started by railways, and like the railways, introduced sweeping changes in employment patterns, social interactions, and infrastructure and goods distribution.

A car dealership or vehicle local distribution is a business that sells new or used cars at the retail level, based on a dealership contract with an automaker or its sales subsidiary. It employs automobile salespeople to do the selling. It may also provide maintenance services for cars, thus employing automobile mechanics, stock and sell spare automobile parts, and process warranty claims.

Auto shipping and transport was largely a commercial activity conducted by dealers, manufacturers and brokers until the last ten to fifteen years. The explosion of Internet use has allowed this niche service to grow and reach the general consumer marketplace. This car shipping industry has grown explosively since the advent of the Internet. People are now able to purchase cars from anywhere in the world and have them shipped to their doorstep. The purpose of this research work is to design and implement an Online Automobile Market through which vehicles can be purchased online without physically having to visit the car dealer's showroom office.

2. RELATED WORKS

The first working steam-powered vehicle was likely to have been designed by Ferdinand Verbiest, a Flemish member of a Jesuit mission in China around 1672. It was a 65 cm-long scale-model toy for the Chinese Emperor, that was unable to carry a driver or a passenger. It is not known if Verbiest's model was ever built (Curious Expeditions, 2007). Nicolas-Joseph Cugnot is widely credited with building the first self-propelled mechanical vehicle or automobile in about 1769; he created a steam-powered tricycle. He also constructed two steam tractors for the French Army, one of which is preserved in the French National Conservatory of Arts and Crafts. His inventions were however handicapped by problems with water supply and maintaining steam pressure. In 1801, Richard

Trevithick built and demonstrated his *Puffing Devil* road locomotive, believed by many to be the first demonstration of a steam-powered road vehicle. It was unable to maintain sufficient steam pressure for long periods, and was of little practical use (Encyclopaedia Britannica)

Although several other German engineers (including Gottlieb Daimler, Wilhelm Maybach, and Siegfried Marcus) were working on the problem at about the same time, Karl Benz generally is acknowledged as the inventor of the modern automobile (Stein, 1967). An automobile powered by his own four-stroke cycle gasoline engine was built in Mannheim, Germany by Karl Benz in 1885, and granted a patent in January of the following year under the auspices of his major company, Benz & Cie., which was founded in 1883. It was an integral design, without the adaptation of other existing components, and included several new technological elements to create a new concept. He began to sell his production vehicles in 1888. In 1879, Benz was granted a patent for his first engine, which had been designed in 1878. Many of his other inventions made the use of the internal combustion engine feasible for powering a vehicle. The first motor car in central Europe and one of the first factory-made cars in world, was produced by czech company Nesselsdorfer Wagenbau (later renamed to Tatra) in 1897, the president automobile. Daimler and Maybach founded Daimler Motoren Gesellschaft (DMG) in Cannstatt in 1890, and sold their first automobile in 1892 under the brand name, *Daimler*. It was a horse-drawn stagecoach built by another manufacturer, that they retrofitted with an engine of their design. By 1895 about 30 vehicles had been built by Daimler and Maybach, either at the Daimler works or in the Hotel Hermann, where they set up shop after disputes with their backers. Benz, Maybach and the Daimler team seem to have been unaware of each others' early work. They never worked together; by the time of the merger of the two companies, Daimler and Maybach were no longer part of DMG.

2.1 FEATURES OF RELATED WORKS

CarsDirect : CarsDirect is an American online automotive research portal and car buying service based in El Segundo, California that allows consumers to research, price, purchase, insure and finance a vehicle online. The company also provides lead generation and referral services to auto dealers. CarsDirect was founded in 1998 by Scott Painter, launched from the business incubator Idealab. It was the first company to sell vehicles online directly to consumers, rather than referring consumers to brick-and-mortar dealers as all other online car buying services did at the time. In 2000, Roger Penske invested in the company and joined the Board of Directors (The Car Connection, n.d.).

CarsDirect's research portal provides access to vehicle specifications, reviews, safety information, and vehicle pricing information, including available manufacturer rebates and incentives. The site offers three car buying options: buying a new car online directly through the company, being matched with a screened new car dealer, or locating and purchasing a used vehicle through the site (PC World, 2008).

AutoTrader.com: AutoTrader.com is an American automotive classified Web site operated by AutoTrader.com L.L.C.; Cos Enterprises owns 75% of the company, Providence Equity Partners owns the rest. It was founded in August 1997and is the largest classified automotive site in the United States. Autotrader.com inventory can currently be found at www.edmunds.com, www.nada.com, www.ajccars.com and many other online automotive sites. Autotrader.com is currently the largest such site in the United States, based on ad volume (AutoTrader.com, 2009) AutoTrader.com began working with certified used car dealers. As authorized affiliates for AutoTrader New York, dealers are a part of the AutoTrader Trade-In Marketplace Dealer Program where consumers can come to sell cars online, get a quote, or trade in their car (BusinessWeek, 2009).

Autobytel Inc.: Autobytel Inc. (NASDAQ:ABTL) is an automotive media and marketing services company in the United States. Through Autobytel's marketing network, the company provides both automotive dealers and manufacturers with brand and product marketing opportunities (Patsuris, 2000).

Autobytel offers automotive dealers tools to manage their business. Specific products include: the Rapid Response program, designed to connect dealers to online customers via phone, as well as the Email Manager program, which manages long-term email campaigns on behalf of the dealership. Additionally it operates a program called LeadCall a live call program that sets in-dealership appointments and scores customer readiness to buy for auto dealers.

Autobytel also offers the AutoReach Ad Network, an automotive ad network of third party Web publishers visited by in-market automotive consumers (Weintraub, 2001).

NigeriaBay.com: This platform allows automobile dealers to sell their cars and automobile online with their business targeting the Nigerian market, and sell for free on this website. This website allows buyers and sellers to make contact online and proceed with their business at designated places comfortable enough for them. Some businessmen or women that do not have internet access or time to post advertisements on the website daily can use sales personnel (male or female) and give them internet access so that they can post as many advertisements as possible daily.

OLX.com: The company was founded in March 2006 and is privately held, it is used in over 106 countries which includes Nigeria. OLX provides a simple solution to the complications involved in selling, buying, trading, discussing, organizing, and meeting people near you, wherever you may reside. Users can control selling, buying, and community activities in MY OLX. Users can also display advertisements on their social networking profile (facebook, twitter etc).

Carmart Nigeria: On this platform you can market your vehicle to a wide range of people, students, co-dealers, engineers, mechanics, and enthusiasts that visit this site. Buyers often rely on the recommendation of technical people to buy their vehicles. Selling or buying a car on this website is much cheaper than going to used car dealer since you can save thousands of naira on commission you would ordinarily have paid to any number of middlemen that are part of the deal.

Kaymu.com: Is an online platform where buyers and sellers meet and make awesome deals. Kaymu is the place where buyers can buy cheapest items, used or new, such as smartphones, computers, fashion and clothing, home appliances, cars and real estate for the best price. A merchant that wishes to sell their products, can easily advertise and sell them directly to the customers living next to them. The transactions are safe and secure and the buyer gets to choose where and when the delivery will take place, or the shipping option.

NigeriaOnlineMarket.com: Nigeria Online Market is a local community site that was developed to provide a high quality classified advertisement service to Nigerians. The owners of the site are keen to improve the online services available to people in Nigeria. People get to buy almost everything ranging from cars, jobs, apartments to furniture either used or new.

3.   **SYSTEM ANALYSIS AND DESIGN**

3.1 DESCRIPTION OF EXISTING SYSTEM

A customer interested in buying a vehicle visits the location of the showroom of the automobile dealer. They are taken round the premises where they are shown the vehicles put on display for sales. When the customer sees a vehicle that he/she is interested in acquiring, the sales person quotes a price which may be haggled over by the customer until a desirable price, consented by both parties is reached. When the cost of the vehicle to be purchased is eventually settled, the customer pays the cost in cash to the sales person and the vehicle key and the other particulars are handed over to the new car owner.

3.2 PROPOSED SYSTEM
The proposed system will tackle the following problems from the previous and earlier systems:
    i.   unstructured catalog (for display of automobile products)
   ii.   automobile customization
3.3 SYSTEM DESIGN
3.3.1 INPUT DESIGN
The system will permit and allow users to communicate with the system with users selecting the kind of automobile product they desire and want to purchase which will be processed by the administrator of the system.
 3.3.2 OUTPUT DESIGN

The system after proper construction and development, it should allow users to view, analyze automobile products that have been displayed on the proposed website for this system. It also allows user to apply for any product of their choice and request for it within a stipulated period of time, the customer or user should be alerted to seal the transaction.

3.4   SYSTEM DATA FLOW
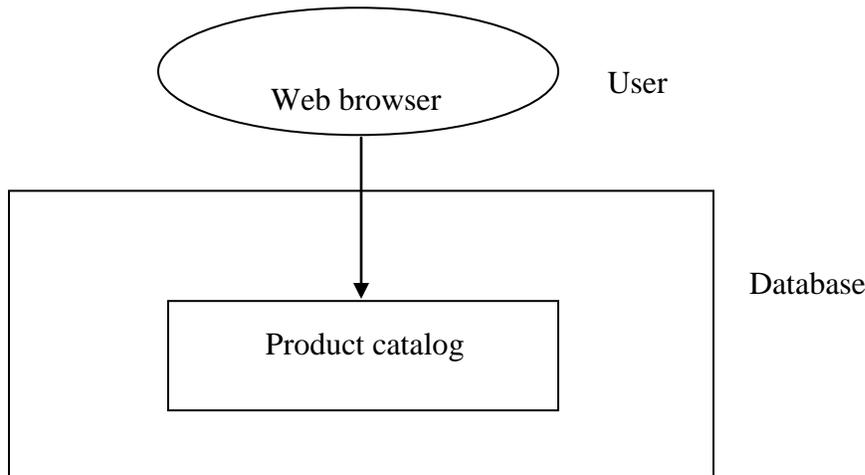
3.5   SYSTEM IMPLEMENTATION

Online Automobile System supports organization's ability to acquire, retain and develop the best talent and skills which helps to determine present and future manpower requirements of the organization in coordination with planning and job analysis activities.

The functionalities of the developed system should walk through the likes of: helping the organization to obtain the number and quality of employees that can be selected in order to help the organization to achieve its goals and objectives since the automobile system acts as a link between the employers and the job seekers meeting the organization's legal and socil obligations regarding the composition of its workforce.

The system has been developed through the functionalities provided by the languages that have been described above which were: Javascript, CSS (Cascading Style Sheets), HTML (Hypertext Markup Language), AJAX (Asynchronous Javascript and XML), Flex builder (Flash), PHP (*Hypertext Preprocessor*), and MySQL (Structured Query Language). These languages were all incorporated into the constructed design for the proposed website with each functioning in the areas outline below:

- i.   User interface design
- ii.   Database connection
- iii.   Database query (insert, retrieve/update and delete records)
- iv.   Automobiles searching for specific vehicle specifications
- v.   Error entry checking

The languages that were used helped the system with the above stated features through:

- i.   Html

This language which has been known to be a web language universally is the basis for web development and programming which is the mother on which the user interface has been constructed through including the web layouts and orientation which is responsive and has been made possible through Html5 and a little of Html4 which resides both at the client and server side.

- ii.   Javascript

Javascript is a client-side web programming language, which helped in working with the web form elements without actively reloading the webpage causing delay in active response from the webpage.

- iii.   CSS

Cascading Style Sheets has helped in the styling of the interface that has been constructed using Html to beautify and make the website more presentable and appealing to users.

    iv.   Ajax

Asynchronous Javascript and XML is a web language that aids the website not to always refresh or reload when it is about to fetch database contents unto the requested webpage without going to another webpage entirely making a webpage flexible. It has been used to fetch job information from the database.

    v.   PHP

This served as the scripting language in the web application that makes the website easily communicable with the server running the website.

    vi.   Mysql

This has been the medium of query from PHP to the database stored on the Mysql server.

    vii.   JQuery

It was employed in the construction and movement of slideshows of automobile pictures on the website that has been designed for this proposed system.

4. SYSTEM TOOLS

In the development of this work, the following software were used:

    i.   XAMPP server
    ii.   Web browser (Any will work e.g. Chrome, Mozilla Firefox, Internet Explorer, Safari, etc.)
    iii.   JQuery slideshow plugins

4.1   SYSTEM USER REQUIREMENTS

The developed system for the newly proposed online automobile system which was understudied in this work has been narrowed down to the following:

    i.   User homepage
    ii.   Collage of automobile vehicles
    iii.   View details of automobile products
    iv.   Submit selected product to administrator

The system has been well structured to sieve through users entered data on the website should there be invalid entries or null entries into the web form on the website that has been designed. But with the above, the user can be sure of a fast interview providing the best shot at getting the befitting job.

5.   Conclusion

With the successful implementation of the Online Automobile Market, the problems faced while purchasing vehicles in the Nigerian Automobile Industry will be eradicated thus enabling vehicle dealers to provide services that allow individuals conveniently and safely carry out transactions without leaving the comfort of their homes or offices or having to pay a visit to the show room of the car dealers. As a result the quality of service provided by automobile dealers in the country will improve tremendously.

6. Recommendations

      In order to achieve the maximum benefits of the goals set out to be achieved by this research work, the following recommendations have been put forward for future researchers on this or other related topics:

- This online application should be hosted on a foreign web server as there will be guarantee of reliable access to the information system as the problems such as power outages and poor service delivery, which could be experienced when hosting the application locally, will be avoided.
- Information stored on the online database should be stored in an encrypted format so as to further provide protection against intrusion.
- Provision should be made for a online or cloud database backup in the event that the current database is damaged.

7. References

A brief note on Ferdinand Verbiest. Curious Expeditions. 2 July 2007 – Note that the vehicle pictured is the 20th century diecast model made by Brumm, of a later vehicle, not a model based on Verbiest's plans.

The First Car - A History of the Automobile. Ausbcomp.com. Retrieved 2014-04-17.

AutoTrader.com L.L.C.- 2009-06-28. About AustoTrader.com.

Bertel Schmitt (15 February 2011).- Auto industry sets new world record. The Truth About Cars.

BusinessWeek. Retrieved- 2009-06-28. AutoTrader.com Company Overview.

F.G. Fowler and H.W. Fowler. (1976). Pocket Oxford Dictionary. London: Oxford University Press. ISBN 0-19-861113-7.

Georgano, G. N. Cars: Early and Vintage, 1886–1930.- (London: Grange-Universal, 1985)

Georgano, N. (2000).-Beaulieu Encyclopedia of the Automobile. London: HMSO. ISBN 1-57958-293-1.

Online Car buying Guide. -October 6, 2009. Online Car Buying Guide.

Patsuris, Penelope (March 17, 2000).- Autobytel Succeeds Globally. Forbes.

Plunkett Research, Automobile Industry Introduction (2008) - Online Etymology Dictionary

Plunkett Research.- 2008. Automobile Industry Introduction.

Ralph Stein (1967). The Automobile Book. Paul Hamlyn Ltd.

SmartMoney.com.-2012. The Benefits of Buying Online.

The Car Connection. CarsDirect, Penske, UAG in Dot-Com Alliance. PC World. 7 sites for buying, selling, and renting almost anything. -2008-10-01.

Weintraub, Arlene (July 9, 2001). -Make or Break for Autobytel. A Web site it's testing for GM could be the new business model the sputtering company needs. Business Week.