Journal of Business and Economics, ISSN 2155-7950, USA
August 2014, Volume 5, No. 8, pp. 1205-1210
DOI: 10.15341/jbe(2155-7950)/08.05.2014/002

http://www.academicstar.us

Positing Augmented Reality as a Marketing Tool for Jobs and Tourism in Northeast North Carolina

Paulette K. Edmunds[1], Kingsley Nwala[1], Rebecca Hochradel[2]
(1. Elizabeth City State University, Elizabeth City, NC 27909, USA;
2. Delta State University, Cleveland, MS 38733, USA)

Abstract: This paper looks at augmented reality and proposes how the technology can assist northeast North Carolina in expanding the region's economy. Augmented reality is explained and examples are given of how it is being used by other localities and private firms. Northeast North Carolina has experienced slow economic growth and high unemployment. Jobs creation is taking place; however, improved methods of bringing job providers and job seekers together are needed. Augmented reality is proposed as a means to accomplish this goal. The technology is also posited as a means of increasing tourism. Tourism is a significant revenue generator for North Carolina, the sixth most visited state in the nation. The state can model smartphone and tablet apps after already established augmented reality tourism apps to make visits to North Carolina an "experience". Assets that augmented reality can showcase in northeast North Carolina are described.

Key words: augmented reality; marketing; employment; tourism; North Carolina
JEL codes: M3, O4

1. Introduction

This exploration looks at the viability of using augmented reality to advertise employment opportunities in northeast North Carolina and bring job providers and jobseekers together. The paper also discusses the potential for using augmented reality as a tool to promote tourism in the region. Promoting both of these uses of augmented reality is being considered because economic development is a goal with which the region is struggling.

Job creation is a high priority in the region and nationwide; however, discovering companies that are hiring and finding open positions continues to pose a serious problem for those seeking jobs. Electronic and internet search techniques are increasingly being used in conjunction with traditional job search methods to facilitate the process of locating and applying for jobs. Augmented reality is emerging as the latest electronic advance in bringing employers and prospective employees together.

Augmented reality is also being used on an international scale to aid tourist locations in promoting the

Paulette K. Edmunds, Ph.D., Associate Professor of Marketing, Elizabeth City State University; research areas/interests: marketing. E-mail: pkedmunds@ecsu.edu.
Kingsley Nwala, Ph.D., Dean and Professor of Economics, Elizabeth City State University; research areas/interests: foreign direct investments, monetary and fiscal policies, economic growth and development. E-mail: knnwala@mail.ecsu.edu.
Rebecca Hochradel, Associate Professor, Chair, Division of Management, Marketing, and Business Administration, Delta State University; research areas/interests: marketing. E-mail: rhochradel@deltastate.edu.

attractions of their locality. The same technology that allows users to scan buildings to learn if there are job openings available in the companies located within the premises can also be used to scan buildings to reveal the history of the structure or the menu of a restaurant located inside. Individuals can focus their smartphone cameras on a site and collect information that converts a trip into an "experience;" an experience that they may want to return to as well as encourage others to visit. Memorable times spent in the region by visitors are what may help tourism grow and become an economic driver in northeast North Carolina.

2. Augmented Reality

Understanding how augmented reality can drive employment and tourism requires an understanding of augmented reality and how it operates. Augmented reality integrates digital information with live video or the user's environment in real time. The technology combines a real world image with a computer generated virtual image or environment (Bimber, 2005; Khan, 2012). The term augmented reality was first coined by Tom Caudell, a researcher at Boeing, who in 1990 used it to describe a digital display used by aircraft electricians that blended virtual graphics onto a physical reality (Cassella, 2009). Presently, a common application of augmented reality can be viewed during televised football games when the actual image of the football field is overlaid with a computer generated yellow arrow and line that illustrate the yardage required for the offensive team to achieve a first down.

Augmented reality should not be confused with virtual reality. Azuma (1997) states that virtual reality completely immerses a user in a synthetic environment. That contrasts with augmented reality's capability of allowing the user to see the real world with virtual objects superimposed. Augmented reality supplements reality rather than completely replaces reality by giving the impression that the virtual and real objects coexist in the same space. Foster (2012) embraces augmented reality and states that augmented reality applications are about to go mainstream. He further asserts that augmented reality may spell doom for QR (quick response) codes. Foster believes that augmented reality opens enormous real-world marketing opportunities.

3. Augmented Reality as a Job Search Tool

Dan Schawbel (2011) said that a decade ago, if you had the right "hard skills", you were almost guaranteed a job. You could virtually trade your college diploma for a job. However, as the economy started to change and available jobs for graduates began to dwindle, finding a good paying job has become a daunting task. People are starting to use mobile applications on smartphones and tablets when seeking a job. Some facilities have already made it possible for people to use their mobile devices to scan a building and use augmented reality to see if the company inside is hiring. Huhman (2012) states that 77 percent of today's job seekers are using apps on their smartphones to facilitate the search process. Layar is one augmented reality software browser found built into some smartphones. When a person uses the Layar application, the individual is able to point the camera on their smartphone or tablet at visible sites such as a building or poster and see what companies have positions open at that time. Individuals can then download the companies' openings for further follow up. The ability to get information from scanning a building can be especially helpful to the job seeker who did not know that a company could be found at that location (Augmented Job Search 2009). Furthermore, friends and family can more easily be enlisted in the search process since they are only being asked to scan locations with their phones and forward any information found.

4. Northeast North Carolina Economy

The use of technology such as augmented reality as a job search tool is important because recovery from the most recent recession has been slow and painful and the unemployment rate is disconcerting in North Carolina. According to the U.S. Bureau of Labor Statistics (2012), the nation's unemployment rate in the month of August 2012 stood at 8.1 percent. Prosperity Watch (2012), of the North Carolina Justice Center, states that North Carolina continues to have some of the worst labor market conditions that can be found nationwide. The North Carolina Division of Employment Security (2012) that monitors unemployment trends and policies in the North Carolina states that northeast North Carolina, the region that is the focus of this study, had a 9.7 percent unemployment rate in August 2012, making it the fourth highest jobless rate in the nation.

The unemployment levels for the counties included in this study are listed below.

Table 1 Unemployment Rates for Northeast North Carolina's Counties by May 2012

County	2012 Unemployment rate (%)
Beaufort	10.7
Bertie	11.6
Camden	7.4
Chowan	10.2
Currituck	5.2
Dare	9.9
Gates	7.7
Halifax	12.8
Hertford	10.6
Hyde	9.2
Martin	11.2
Northampton	11.0
Pasquotank	10.3
Perquimans	9.8
Tyrrell	9.4
Washington	11.5

Sources: North Carolina Department of Commerce-Labor and Economic Analysis Division and Outer Bank Voice Publications (2011-2012).

According to the North Carolina Department of Commerce-Labor and Economic Analysis Division, the northeast and southeast regions of North Carolina have lagged substantially behind the other regions of the state in terms of economic development (2011-2012). These areas are unique in that they are the only regions that experienced shrinking numbers of employed individuals over the year. The Commerce-Labor and Economic Analysis Division went further to say that the total number of unemployed people looking for jobs is also in decline suggesting that many workers in these regions may be withdrawing from the labor force because they have been unable to find jobs or emigrating out of the region.

The state is attempting to create new jobs to help bring the employment rate to the pre-recession level. Some of the area's employers who are helping to grow the economy are:

- Domtar, a producer of sustainable fiber-based products including paper and pulp as well as diapers.
- DRS Technologies, a provider of support to the nation's military with environmental control systems, power generators, and chemical/biological decontamination systems.

- The North Carolina Center for Automotive Research used by auto manufacturers, suppliers, researchers and inventors to physically test car designs and equipment.
- The North Carolina Department of Transportation's Division of Aviation, which works on research and development in conjunction with firms in the aviation and aerospace industries.

State efforts of job creation may not be enough to increase employment numbers in northeast North Carolina if citizens of the region are not informed of employment openings. Therefore, creating awareness of available jobs becomes almost as critical as generating the available positions.

Dispersing information of job opportunities is where augmented reality can play an important role. Augmented reality is a way to use technology to enhance one's view of the physical world, and augmented reality software applications such as Layar are designed to allow people to not only see the companies near the individual's location and but also show what positions are open at those companies. Layar superimposes computer generated imagery such as a text or photos in live video streams on smartphones. The software application also has the ability to capture job listings stored in any database close to the user's location. The city of the listing, building location and proximity can also be documented and shown to the smartphone user. The job seeker can see in-depth company information such as the number of people employed by the organization, salary information, and data on the industry of the firm. The individual can also view company produced videos and potentially contact the recruiter of the job posted.

5. Northeast North Carolina Tourism

North Carolina is implementing a long-term marketing strategy with an overall goal of diversifying the regional economy. One of the target areas for growth is tourism. Mary Hunter (2012) states that the sixteen counties that make up the region represent a striking combination of inland waterways and beaches. The northeast North Carolina region also has numerous attractions associated with its heritage. Tourism in the state is already an important revenue generator and it has the potential to become even more significant economically. North Carolina is the sixth most visited state in the United States. Visitors enjoying the state's offerings of historical sites, scenic beauty, and outdoor activities in 2011 spent $18 billion. The expenditures made by tourists supported 40,000 businesses and approximately 200,000 jobs statewide. Additional state benefits were derived because North Carolina earned $1.5 billion in purchases of state goods and services as well as tax revenues collected from the spending of visitors (North Carolina Department of Commerce 2012).

Augmented reality can grow state income derived from tourists by bringing the sights and sounds of the state to life for visitors and locals. Conde Nast Traveler has already demonstrated how augmented reality can be an asset to the tourism industry. It has released augmented reality city guide apps for New York, Barcelona, Rome, and Paris. Individuals download the Conde Nast app to a smartphone, scan points of interest in the environment with the phone's camera, and augmented reality overlays the site with information. People can use the scan to learn the history of a city, take audio tours of local sites, and hear residents provide "word of mouth" comments about their favorite eateries and activities (Conde, 2010).

Northeast North Carolina can capitalize on developing similar apps. Visitors can be provided the opportunity to relive the history of the region through the technology of augmented reality. Some examples follow.

The Great Dismal Swamp runs through northeast North Carolina. A scan of the swamp could illustrate the 1864 historical fact of Robert Frost making the Dismal Swamp his home and living with duck hunters when he

was expelled from Dartmouth college and rebuffed by his fiancé (Today in Literature, 2012).

Prior to that, George Washington and others drained parts of the swamp to yield farmland they believed would be fertile. Leading the development of the Dismal Swamp Canal, the oldest man-made waterway that has been in continuous operation (Project 543, 2012), Washington transported harvested timber and shingles from the area through the canal (Wester, 2012).

The Great Dismal Swamp also served as a station on the Underground Railroad that African-American slaves used to escape to the north where they could gain their freedom. The U.S. Department of the Interior dedicated the National Wildlife Refuge of the Great Dismal Swamp as the first refuge officially included in the Countrywide Underground Railroad Network to Freedom Plan (In Pursuit, 2004; Maroon, 2012)

Additional historic events that could be portrayed in augmented reality scans include the relocation of Cape Hatteras Lighthouse, the tallest of the U.S. traditional lighthouses. A Guinness record was set when the lighthouse was moved 2,900 feet in 23 days to save it from the erosion of the North Carolina coastline (project 543, 2012).

The Outer Banks that lie along the Atlantic coastline of North Carolina not only have beaches and sand dunes that invite bathing, bird watching, and crabbing, they are also home to Kill Devil Hills. Aviation and History buffs are attracted to Kill Devil Hills where Orville and Wilbur Wright took their historic flight in 1903. Augmented reality might allow visitors to scan Kill Devil Hill and see the Wright brothers take flight.

The imagery of these historic activities overlaying actual landmarks would be a powerful tool to be used in attracting visitors. Tourism revenues would most certainly increase as the state Division of Tourism and regional and local convention bureaus promote the opportunities of experiencing history as it originally occurred. Currently, the closest tourist bureaus can come to establishing a similar experience is through reenactments. However, such productions are costly to produce and the cost must be passed on to the visitors who find it difficult to justify the expenditures in today's economic climate. Augmented reality apps have a one-time production cost that can be spread over a large number of viewers. CondeNast Traveler is charging $10.00 for its tourism apps. A $10.00 expenditure that covers an entire region for a family of any size is a minor cost. Contrast that with $64.00 per person to enter the Biltmore Estate (the country home of the Vanderbilts) in Ashville, NC. in 2012. Individuals that have budget concerns will gravitate to the inexpensive experience that augmented reality provides.

6. Conclusions and Future Research

This descriptive and qualitative study sought to discuss the value of augmented reality applications to the northeastern region of the state of North Carolina. The work looked at the need for employment assistance in the region and how augmented reality can be used in advertising open job positions. Research showed that northeastern North Carolina has an unemployment rate higher than both the nation and the average for all of North Carolina. The state is making strides in creating jobs; however, some people may be dropping out of the search process because they are having difficulty locating work. Augmented reality has potential for bringing job seekers and job providers together and growing the region economically. CondeNast Traveler has shown that augmented reality can play a role in enriching the experience of tourists. Northeastern North Carolina has scenic beauty and historical significance that will project well with augmented reality. Audio/video tours can be created leading visitors to less traveled sites, explaining the flora and fauna, and even introducing the fish available in a body of water and the best bait to use when fishing. The historical facts that can be brought to life with a smartphone and the associated technology span a wide range of interests and will appeal to many different target markets. North

Carolina tourism currently creates 200,000 jobs and support 40,000 businesses as well as increases tax revenues. Those numbers point out the great significance of tourism to the state. The northeast region of the state could grow the numbers using augmented reality to attract tourists and increase the length of their visit.

The next step in this research is to conduct in-depth interviews with entrepreneurs, managers, and members of the chamber of commerce in northeast North Carolina to determine how receptive they are to the concept of using augmented reality in filling employment openings. Interviews with tourism officials and museum directors need to be conducted to ascertain their attitude toward using augmented reality to promote visits and tourism in northeast North Carolina.

References:

Augmented Job Search (2009). "Bonnier R&D uses 24 hours of entrepreneurship to prototype a new type of job searching experience", accessed June 11, 2012, available online at: http://www.bonnier.com/sv/rd/blog/2009/October/Augmented-Job-Search/.

Azuma Ronald (1997). "A survey of augmented reality", *Teleoperators and Virtual Environments*, Vol. 6, No. 4, pp. 355-385.

Bimber Oliver and Raskar Ramesh (2005). *Spatial Augmented Reality: Merging Real and Virtual Worlds*, A K Peters LTD, Natic, Massachusetts.

Cassella Dena (November 3, 2009). "What is augmented reality (AR): Augmented reality defined, iPhone augmented reality Apps and games and more", *Digital Trends*, accessed on July 22, 2012, available online at: http://www.digitaltrends.com/mobile/what-is-augmented-reality-iphone-apps-games-flash-yelp-android-ar-software-and-more.

"CondeNast traveler releases $10 city guide iPhone Apps with augmented reality" (2010). *The Next Web: Apps*, accessed on June 11, 2012, available online at: http://thenextweb.com/apps/2010/07/05/conde-nast-traveler-releases-10-city-guide-iphone-apps-with-augmented-reality.

Foster Cormac (2012). "E3 show offers evidence augmented reality will kill QR codes, read write enterprise", accessed on June 7, 2012, available online at: http://www.readwriteweb.com/enterprise/2012/06/e3-show-offers-evidence-augmented-reality -will-kill-qr- codes.php.

Huhman Heather (2012). "6 mobile Apps for your job hunt", accessed on September 3, 2012, available online at: http://mashable.com/2012/06/23/job-hunt-mobile-apps/.

Hunter Elle Mary (2012). "Northeast region plans for the future", *North Carolina Business to Business Journal*, 2003-2012 Carolina Business.com.

"In pursuit of freedom" (2004). Accessed on September 3, 2012, available online at: http://nia.ecsu.edu/onr/03-04/040213urr/040213urr.htm.

Kahn Asif (2012). "Bringing augmented reality marketing to every business", accessed on June 7, 2012, available online at: http://streetfightmag.com/2012/04/13/bringing-augmented-reality-marketing-to-every-business.

Maroon Slave Society (2012). "National park service", accessed on September 3, 2012, available online at: http://www.nps.gov/subjects/ugrr/discover_history/maroon-slave-societies.htm.

North Carolina Department of Commerce- Labor and Economic Analysis Division: "News Releases", June 22, 2012.

North Carolina Division of Employment Security (2012). Available online at: http://www.ncesc1.com/PMI/rates/ratesmain.asp.

Project 543 (2012). Available online at: http://project543.visitnc.com.

Prosperity Watch/NC Justice Center (2012). "North Carolina jobless rate", *Prosperity Watch*, Vol. 14, No. 4, available online at: http://www.ncjustice.org/?q=node/880.

Robert Frost's Dismal Swamp (2012). Available online at: http://www.todayinliterature.com/stories.asp?Event_Date=11/6/1894.

Schawbel Dan (2011). "5 Clever Ways to Get a Job Using Social Media", accessed on June 7, 2012, available online at: http://mashable.com/2011/06/19/get-job-using-social-media/.

"The outer bank voice publications" (2012). "Tourism", available online at: http://www.nccommerce.com/tourism.

U.S. Bureau of Labor Statistics (2012). "Labor force statistics from the current population survey", accessed on Sept. 6, 2012, available online at: http://data.bls.gov/timeseries/LNS14000000.

U.S. Department of Commerce, Bureau of Economic Analysis, Travel and Tourism spending grows in fourth quarter (2010), accessed July 20, 2012, available online at: http://www.bea.gov/national/index.htm.

Wester Paulette F. (2012). "The great dismal swamp and George Washington", accessed on August 7, 2012, available online at: http://www.northeast-nc.com/dismalswamp.