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### Radios Life Expectancy

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Radios Life Expectancy

Edward Krikorian

Submitted in Partial Completion of the Requirements for  
Departmental Honors in Communication Studies

Bridgewater State University

May 8, 2019

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### Abstract

*The purpose of this paper is to predict the future of the radio industry by evaluating its origins and current status in society. The invention of radio served a significant importance as to how we communicate on a daily basis, and it still lives on today.*

*The broadcasting system is currently used to communicate to thousands of people at once, but that wasn't the case during its initiation. The "Founding Fathers" of radio such as Guglielmo Marconi, Nikola Tesla, Lee DeForest and Edward Howard Armstrong allowed us to communicate with others over radio waves. I have examined the history of radio and how it came about to be.*

*Through scholarly articles as well as statistics from the Pew Research Center, a thorough analysis has been made as to what the future holds for radio. From what I've examined thus far, radio will be here to stay for the foreseeable future. Currently, 90% of Americans ages 12+ listen to the radio on a weekly basis, down only 3 percent from 2011 (Audio and Podcasting Fact Sheet, 2018). And yet despite the growing smartphone usage and the easy-to-use music streaming service applications, it's not stopping Americans from listening to the radio.*

*To get an even better understanding of what the future holds for radio, I surveyed fifty of my Bridgewater State University peers. The vast majority of people that were surveyed grew up in the digital age. Their opinions are crucial to my final conclusion.*

## Chapter 1 - Radio's Past Meets the Present

Technological innovations have taken massive strides over the course of the past 10 years. Since Steve Jobs debuted the iPhone in January of 2007 (Akkad, 2011), the way in which society consumed media changed forever. Events and TV shows are streamed on iPhones and iPads. Our habits are changing as these technological innovations take off. Consider a smartphone or an iPad. Almost all forms of traditional media can be used on these singular devices. Instead of being played on a record player, new technological devices give consumers the ability to stream any song of their choice at their convenience. Newspapers now have a digital option to allow access to articles online. Mail is still being sent across the world, but more predominantly through emails. Pictures and videos are now available in 4K resolution on the latest smartphones. In fact, the most popular camera in the world is attached to the iPhone. Not only that, but video games are available through the App Store or Google Play store. The ever popular video game *Fortnite* is now available on both platforms.

It took us a long time to get to where we are. Human beings have been around for 200,000 years, yet it's hard to believe that civilization did not flourish until the 18th century. The Industrial Revolution propelled the economy. The Baltimore and Ohio (B&O) Railroad built in 1827 was the first railroad in the United States as many aspects of business management originated from the B&O (Clark, 2017). Yet that was just the beginning of what we are now able to accomplish.

It is believed by many that the telegraph is the greatest technological achievement in human history. It was the first time humans could communicate without using wires. But the system was a bit complex. Instead of communicating with others by talking to them, you would

be forced to use the telegraph. An advanced device for its time, the telegraph used a system known as Morse code. It was a system of encoding text characters so that they can be transmitted without the use of wires. Consisting of a set of short or long beep sounds, the codification is designed to indicate a message (Jacob, 2018). This was the first step to a more convenient way to communicate, but a more convenient communication device was necessary to communicate with a wider range of people.

A group of brilliant inventors Guglielmo Marconi, Nikola Tesla, Lee DeForest, and Reginald Fessenden were essential in the creation of broadcasting radio to thousands of people across the country. Each inventor had their own part in creating the final product, radio. This invention didn't happen overnight as there were hiccups along the way (Belrose, 1995).

The technological miscues that took place were apparent. When creating a device as complex as radio, trial and error is certain. But there were roadblocks that occurred that were out of any of these inventors control.

After the first radio broadcast in 1906 to the general public, many improvements were made to the quality of the broadcast. It seemed as though radio was on its way to the latest and greatest form of communication. But when Woodrow Wilson ordered the United States to enter World War I, the United States military shut down any and all public radio stations until the war came to a conclusion. The United States feared that this new and modern technology might do the country a disservice, and for precautionary reasons, terminated the public broadcasting system for the time being.

Once the war came to a conclusion, radio stations gained popularity and soon, radio stations were played everywhere across the country. In fact, about 25 years later in 1944, the presidential election of 1945 drew in 100,000,000 people over the radio in the United States *and*

from overseas. Radio had officially become a stable form of mass media, not only in the country, but around the world.

FM and AM radio is the foundation of how we first listened to the radio. But today, that is not considered the only form of radio for many. Today, radio may be evaluated differently depending on who you speak to. Podcasts have entered the picture as a dominant media platform and it can be argued that Podcasts are drowning out radio. Podcasts are audio recording that can be listened to at any point in time. It's convenience certainly has its perks, but many avoid to look at its follies.

Radio programs have recently uploaded their entire shows to their Podcast channel. While this may serve as a tremendous convenience, there is also room for improvement. For many Podcast platforms, there is an inability to live-stream episodes. You must wait for the recording to end before uploading to any Podcast platform.

With the emergence of digital audio applications such as Podcast applications music streaming services, and other The Pew Research Center produced excellent statistics based on listening habits of people in the United States.

While the statistics from the Pew Research Center laid a tremendous foundation for this thesis, conducting my own survey was crucial to develop a decisive conclusion.

This piece will dive into the state of one of mankind's greatest technological achievements. By looking at the origin of the radio and its lifespan to today, this piece will attempt to prove that radios future is far from bleak. With new technological innovations, radio has been and continues to be an important way of communication. However, as the years go on, positive perceptions of traditional radio and its role in society seems to be diminishing. In order to understand what the future holds for radio, we must examine its history and how it is

being transformed in the digital age. To claim that traditional radio is currently “dead” would be false, but there is still plenty of speculation for what the future may hold. This research paper aims to inform the reader of radios complicated past, present, and future.

## Chapter 2 - History of Radio

Technology changes rapidly, and so do the names of these technological services. The music industry went from record players, to tapes, to CD's and now comes along streaming services. The same applies for radio. In the origins of radio, the name to identify the technological service was originally called "wireless telegraphy." Wireless telegraphy is defined as a transmission of telegraph signals by radio waves. Essentially, radio, before the term radio was created (Coe, 1993).

It took massive strides to incorporate radio into our everyday lives. On average, over 90% of adults listen to radio weekly (Audio and Podcasting Fact Sheet, 2018). But there wasn't one individual who snapped their fingers and made this accomplishment happen overnight. It took efforts from multiple people and took many historic technological and engineering feats to get to where we are today.

Before wireless telegraphy, a man by the name of Samuel F. B. Morse was an American artist who was deeply interested in a new field of science; electricity. While in France, Morse had been invited to inspect the Chappe semaphore telegraph and was visibly impressed. Yet he was not overly satisfied with the achievement and argued, "the lightning would serve us better." (Coe, 1993) While on a boat that departed from France to New York in 1832, one of the passengers, Dr. Charles T. Jackson, joined Morse in a conversation about the idea that electricity would pass instantly through any known length of wire. From this point on, Morse became obsessed with the idea of a "wireless telegraph" (Coe, 1993). And so, the telegraph eventually was created:

“To send the pulses corresponding with the numerals of his letter code, Morse sketched a metal bar having teeth in groups for the digits. These teeth would act on a lever with contact points to open and close the electric circuit to the electromagnet. Later to be known as the portrule, the device later had the teeth cast in the actual dots and dashes after it had been decided to abandon the number code in favor of dots and dashes to represent directly the letter of the alphabet.” (Coe, 1993, p. 27)

And so, the creation of telegraph signals by radio waves was complete, but the complexity forced new improvements to be made.

While many individuals helped make the first worldwide broadcast possible, there are “founding fathers” who are worth mentioning. Guglielmo Marconi, Nikola Tesla, Lee DeForest as well as Edward Howard Armstrong are at the center of the creation of worldwide broadcasting (Douglas, 1987).

### **Guglielmo Marconi**

In December of 1901, Guglielmo Marconi called a press conference to announce a groundbreaking event in the history of communication: the first ever transmission of wireless signals across the Atlantic Ocean. The signals were transmitted some 2,000 miles from St. John's, Newfoundland to Poldhu, England. Guglielmo was heralded as a hero as he was able to transmit a signal across the Atlantic Ocean with no wires (Hong, 2005).

“The first was his "square law." Based on empirical study, this law stated that an antenna's transmitting distance was proportional to the square of its height. In 1899, he told a reporter for McClure's Magazine that since he sent a message 20 miles with an 80-foot antenna, he would be able to send a message 80 miles with a 160-foot antenna and 5,120 miles with a 1,280-foot antenna. This is why he believed that "if there were another

Eiffel Tower in New York, it would be possible to send messages to Paris through the ether and get answers without ocean cables" (Moffett, 1899). Though it is true that higher antennas generally bring about a greater range, the increase comes from the stronger currents due to the antenna's greater capacity. Because of this, the relationship between the antennas height and the transmission distance is not really the direct ratio stated in Marconi's "law" (Hong S. , 2010) .

One of the challenges in transmitting radio signals for the first time was the structure of earth. Transmitting signals between stations that were blocked by hills, mountains, cliffs, and buildings. But he had eventually overcome the earth's curvature, which is more than a kilometer high (Hong, 2005).

Up until Marconi's groundbreaking achievements, radio remained largely an ethereal mystery, an inventor's dream. But he did set in motion a number of factors that all but ensured the dream would become reality. His advancements in wireless telegraphy ultimately lead to this realization.

### **Nikola Tesla**

Although he set the groundwork for the beginnings of radio, the design was still incredibly flawed. Nikola Tesla, an Austria native, was a brilliant mind. At a young age he was occupied with the task of using alternating current for the distribution of energy. But it would take him years to accomplish his goal (Aubrey, 2018).

In 1882, Tesla moved to Paris where he worked for Continental Edison Company. His work was admired by Edison, who invited him to come to New York to work for him (Aubrey, 2018). During his time in New York, he invented the Tesla Coil, an air-core transformer

designed to produce high voltages at high frequencies. This was the foundation of what was yet to come (Aubrey, 2018).

While Tesla and Edison teamed up to change the way in which we communicate, the two masterminds had completely different personalities and were not destined to have a long working relationship. Tesla went on to create electrical power and currents. His system had provided the power for the spectacular Chicago World's Fair in 1893; the first electrical fair in history (Aubrey, 2018). That same year, the Niagara Falls Commission was so impressed with his work that they offered Tesla a contract to build three generators at Niagara Falls to Westinghouse's firm (Aubrey, 2018). It's considered to be one of the greatest engineering feats in history. However, Tesla would not be satisfied with his historic achievements.

Tesla's goal was to create a worldwide broadcasting system, something that was yet to be accomplished. Marconi had sent signals across the Atlantic Ocean, but worldwide communication had yet to be seen. Tesla set up shop in Colorado Springs where he built the largest Tesla Coil ever, a twelve-million-volt machine capable of producing artificial lightning that soared up to 135 feet in the air (Aubrey, 2018). After some success, Tesla went back to New York where J.P. Morgan funded for the construction of a transmitter for the world broadcasting. Unfortunately, with labor troubles and lack of support, Tesla was not able to complete the project. His groundbreaking engineering feats such as the alternating current motor laid the foundation for the power system used throughout the industrialized world. The Tesla coil is widely used in television and radio sets, and scientists still eagerly explore Teslian concepts (Aubrey, 2018).

Marconi and Tesla worked wonders with their engineering inventions, but neither of these individuals did quite enough to turn radio into a reality. Lee DeForest sought to complete the daunting task that Marconi and Tesla never could.

DeForest, the self proclaimed “father of radio” set out on a mission to invent for the public good and not just for self profit, but his true claim to glory was offset by another individual named Reginald Fessenden, who’s contributions to radio channels entering household across the United States were perhaps equally as important as “the father of radio” Lee DeForest.

Fessenden made his claim to fame in 1906 on Christmas Eve when he set out to broadcast from Brant Rock, a small New England town north of Cape Cod. A letter he wrote in 1932 reflected on this event:

“This broadcast was advertised and notified three days in advance of Christmas, the word being telegraphed to the ships of the U.S. Navy and the United Fruit Co., which were equipped with our apparatus that we intended broadcasting speech, music and singing on Christmas Eve and New Years Eve. The program on Christmas Eve was as follows: first a short speech by me saying what we were going to do, then some phonograph music, Handel’s Largo. Then came a violin solo by me, being a composition by Gounod called “O, Holy Night,” and ending up with the words “Adore and be Still” which I sand one verse of, in addition to playing the violin, though the singing, of course, was not very good. Then came the bible text, “Glory to God in the highest and on earth peace to men of good will,” and we finally wound up by wishing them a Merry Christmas and then saying that we proposed to broadcast again on New Years Eve.” (Greb & Adams, 2003, p. 31)

Although this was considered to be the first broadcast to the general public, Fessenden's ultimate goal was to simply build a radio telephone for commercial purposes. Using his own transmitter, he proved that clear speech and music could be transmitted without the use of wires. His invention was, "the first device to enable operators to receive signals by 'ear'" (Greb & Adams, 2003).

Fessenden's eccentric personality eventually led to his demise. His backers at NESCO (National Electric Signaling Company) had enough. The company fired him and removed his equipment. Luckily, there was another brilliant inventor who continued to build on the foundation of radio, Lee DeForest.

### **Lee DeForest**

Lee DeForest is said to be the most important of the 20-year radio evolution. The self-proclaimed "Father of Radio" experimented with voice communication and transmitted a message to several receiving stations at once (Spencer, 2005). He is best known for his technical contributions and improvements to the basic invention of all radio and television, the vacuum tube (Greb & Adams, 2003).

There are three events that defined DeForest in the development of broadcasting: (1) his equipping in 1907 of the Navy Fleet with radio telephony, (2) his publicized broadcasts of opera in New York City between 1907 and 1912, and (3) his transmitting of news and music by radio in New York and San Francisco, 1916-1917 and 1920-1922 (Greb & Adams, 2003).

These aforementioned inventors are the "founding fathers" of radio. That label can be put on one specific individual, but it's evident that all of these brilliant minds had a significant part in creating what is known today as radio or radio broadcasting.

### **World War I**

In 1917, the United States entered World War I and the Government prevented any and all radio stations from broadcasting. KDKA, the first American station to receive a license to produce broadcasts (Godfrey, 2012), was forced to terminate all broadcasting as well. However, the United States terminated radio in the United States for precautionary reasons (Ackerman, 1945).

Originally in the military, synchronized movements were conducted by using a wristwatch, but there was room for fatal errors. An incorrect time on one person's wrist and the whole operation is in disarray. Carlene Stephens of the Smithsonian's National Museum of American History claims, "The entire process of using artillery to protect folks in the trenches, as they advanced, was an elaborately timed, choreographed forward motion." The safety of thousands of troops was determined by an unreliable device that wraps around your wrist. When World War I arrived, the conflict between nations also introduced the birth of emerging technologies that would remake life on and off the battlefield (Myre, 2017).

Among the new technologies that were introduced included machine guns, tanks, radios, military aircraft and chemical weapons. The key technology that gave the United States an advantage was indeed radio. In fact, radio was considered to be so dangerous that the day after Congress declared war, the U.S. government banned private radio stations and equipment, fearing it might be misused. O'Connell elaborates on this, "What the government does by taking over the radio industry, they pour funding into it for research and development, and were able to really fund technological advances that would have otherwise taken years" (Myre, 2017).

Prior to the War, telegraphs and radio were being used by some Americans. Thomas H. White gives a perspective of what listening to the radio was like in the mid 1910's, "Fancy a boy sitting in his room at home with his fingers on a telegraph key and a telephone receiver to his ear

listening-in to the news of the world as it is flashed out from the great coast stations or by ships far out at sea!” (White, 2003)

Once the War was over, radio was reintroduced to Americans. Not only did the United States emerge as a true military power after the war, but the country grasped a new appreciation for technology. And shortly after the war, commercial radio stations became permanent in the U.S.

It was only a matter of time until radio was listened to by hundreds of people across the country. A public opinion piece written by William C. Ackerman in 1945 describes what it was like when radios first entered hundreds of households across America. The article marked the twenty-fifth anniversary of American broadcasting. At this point in history, radio and public broadcasting had changed the worlds ways of communicating (Ackerman, 1945).

### **Public Consumption**

Regular public consumption of radio broadcasting began in 1920 from stations in Detroit (WWJ) and Pittsburgh (KDKA). November 2, 1920 was a memorable night for the revolutionary technology. November 2nd marked the enshrinement of the 29th President of the United States. Due to the fact that the technology had just been introduced to the public, there were only a few hundred people in East Pittsburgh who tuned into the broadcast of the winner of the 29th Presidency.

Warren G. Harding was victorious in the election of 1920, but a quarter of a century later, the number of persons who tuned in to the presidential race drastically spiked. In the election of 1944 featuring Democratic nominee Franklin D. Roosevelt and Republican nominee Thomas E. Dewey attracted over an estimated 100,000,000 persons to tune in to their radio broadcasting

systems in the United States and overseas. This technology was becoming more common in peoples households as the years went on.

Ackerman's opinion article notes the influential changes that radio was having on everyday society, "from academic institutions, from labor unions and business organizations, from the motion picture industry, from magazine and newspaper offices, from government agencies, from the advertising, marketing, polling and public relations fields. (1)"

More changes emerged to radio in the late 1940's when yet another popular entertainment/communications known as the television was gaining popularity. By 1949, 1 million U.S. households owned a TV set (Godes, 2004).

"With this Many popular radio programs switched over to television, and radio listenership declined, particularly at night. However, sales of car radios continued to climb due to the proliferation of automobiles in the post-war period. Radio listening began to change from a primarily stay-at-home activity to one that was increasingly part of the car driving experience."

The car driving experience saved the way in which people listen to the radio. At-home radio was being taken over by TV viewers. But another component that saved traditional radio was DJ's. DJs had popular and loyal fanbases, and as one industry observer noted, DJs were considered to be "stars"(Godes, 2004). Due to the integration of DJs in the 1950's and 1960's, revenues reached an all-time record of \$709 million in 1962 (Godes, 2004). DJs still have a profound effect on attracting audience members today.

In the late 1960's and early 1970's, the radio industry changed. FM radio became the most viable commercial radio alternative (Godes, 2004). The sound quality was clearer and more concise. And as a result, artists were, "increasingly making use of the latest high-fidelity

recording technologies” (Godes, 2004). Lee Abrams, a notable industry consultant of the time, discussed the differences between AM and FM radio:

“AM radio appeared out of touch and unable to accept the new trends in music.

AM looked and sounded out of date. FM threw away the AM rule book. It was a new approach and a new attitude” (Godes, 2004).

Throughout the 1990’s, FM radio continued to grow and become more profitable than AM radio.

Despite the emergence of television and satellite radio later on, traditional (FM/AM) radio managed to survive the new ways of communication. However, it’s noticeable that traditional radio was forced to adjust to the modern times. While traditional radio is still offered in almost every car on the market, many technological platforms are changing the way in which we listen to radio.

### Chapter 3 - What does Radio Look Like Today?

Transformation of technology is essential in order for society to progress. Without creating the latest and greatest technologies, civilization would be stagnant. If radio were still as relevant as it was 100 years ago, then technological advancements would be disappointing. While the technological and engineering achievements that were produced at the time of radio's birth were some of the greatest in mankind's history, there have been some noticeable transformations to radio.

When we considered radio in the early-to-mid 1900's, only AM broadcasting stations were prevalent. As time has gone on, there have been many modifications to the traditional "radio".

If you consider how many new forms of technology have formed since the industrial revolution and how many technological devices have drowned out, you would think that radio would have been dead by now. But what's amazing is that radio has still kept its relevance over the course of the past hundred years or so.

Heidi D. Campbell and Rick Sparks, professors at North Greenville University, and features authors in *Communication Technology Update and Fundamentals: 15th Edition*, consider the drastic transformation that radio has taken over the years. They are also confused as to how, despite the technological innovations that have taken place, especially recently, how radio has survived. "Radio was supposed to be dead by now. But in the age of the Internet, Satellite, and HDTV, radio has managed to survive" (Grant & Meadows, 2016).

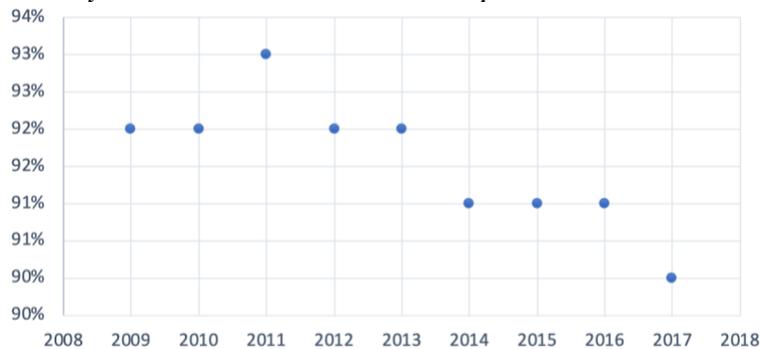
Consider the audio technologies that have drowned out over the course of the past twenty years. The first portable CD player, Sony's Discman, debuted in 1982 (Costabile, 2018). But like

many technologies, portable CD players are a rarity and now incredibly inconvenient. The approximate lifespan of portable CD players lasted about 35 years.

With the ability to navigate the internet at your fingertips and the ability to play any song of your choice with a smartphone, terrestrial radio numbers are still surprisingly strong. The chart below chart below showcases how many Americans (ages 12+) listen to terrestrial radio on a weekly basis (Audio and Podcasting Fact Sheet, 2018).

Table 1

*Weekly Terrestrial Radio Listenership*



*Note:* Adapted from the *Pew Research Center*. Retrieved July 12, 2018  
From <https://www.journalism.org/fact-sheet/audio-and-podcasting/>

The X axis in Table 1 indicates the percentage of people who listen to the radio weekly (ages 12+) and the Y axis indicates the year.

While there has been a slight decline of two percent since 2011, the fact that ninety percent of Americans (ages 12+) listen to the radio in the digital age is impressive (Audio and Podcasting Fact Sheet, 2018).

Campbell and Sparks recognize that this is an anomaly. Confused about the success that radio still has even today, Campbell and Sparks consider how people operate on a daily basis today, “However, digital audio services pose a threat to the medium that demands its reinvention. Today, people want what they want when they want it, and why not?” (Grant & Meadows, 2016).

The Pew Research Center also did a statistical analysis on basic demographics of people who listen to the radio:

Table 2  
*Radio Listenership Demographics*

<b>Radio Statistics</b>	
Average Age	45
Average HHL D Size	3.3
Percent male	55%
Percent female	45%
Work Full or Part-Time	69%
Average Yearly HHL D Income	\$74,200
Time Spent Listening to Radio Each Week	23:58
Time Spend Watching TV Each Week (HH:MM)	27:50:00
Time Spent Online Each Week (HH:MM)	8:42
Percent Consumers Using Social Media	75%

*Note:* Adapted from the *Pew Research Center*. Retrieved July 12, 2018  
From <https://www.journalism.org/fact-sheet/audio-and-podcasting/>

The average age of radio listeners is 45 years old according to **Table 2**. This can be interpreted that younger listeners are moving away from traditional radio. The younger generations have become so reliant of their phones and its convenience. Given its convenience factor, Campbell and Sparks suggest that digital audio services are the biggest threat to radio, and deservedly so. For just five dollars per month a college student can listen to any song at any time without advertisements that comes with radio is a good reason to switch from radio to digital. Yet an interesting phenomenon has taken place that might shape the future of radio.

If you have a subscription to a music streaming service such as Apple Music or Spotify, the applications allow you to listen to any music genre you can possibly think of. With radio, the same applies. Radio stations today have a number a genres, and if you include satellite radio, the genres are virtually unlimited. Everything you could possibly want to listen to is at the tips of your fingertips. Any and all genres from news, talk and sports, to country, contemporary, rock and alternative, urban, etc... However, the ease of use of music streaming services is far easier

than radio. Simply download the music streaming service from the App Store or Google Play store. Then pay for a subscription (or listen for free with advertisements) to listen to any song you desire at the palm of your hand.

In order to find the station that best suits your interest on the radio, you must use a dial to navigate through hundreds of stations. The ease of use factor is not nearly as convenient as Podcasts.

Traditionally when we think of radio, we think of radio being played through a broadcasting system. However, in the past few years, a milestone was passed in regards to how we listen to radio on a daily basis. The Pew Research Center, which conducts public opinion polling, demographic research, content analysis and other data-driven social science research, analyzed the current status of the radio industry (About, 2019). The company showcased an intriguing statistic as to how often Americans tune into the radio on a monthly basis:

“While the overwhelming majority (93%) of the U.S. population 12+ still listens to traditional broadcast radio on a monthly basis, a significant milestone was surpassed in 2015: more than half (57%) of Americans now listen to online radio monthly, with 50% of those ages 12 and older listening to online radio every week (Edison, 2016).”

Campbell and Sparks implement statistics conducted from the Pew Research Center once again:

“According to the Pew Research Center, monthly online radio listening has doubled since 2010, with more listening done through mobile devices than through desktops (Vogt, 2015a). It appears that online radio is the predominant choice among young music listeners, with smartphones driving the increase. In 2015, 73% of American adults 18+ listened to radio online via smartphones. That is an increase of 7% in only one year,

while laptop and desktop listening decreased by 6% over the same period. (Edison, 2016)”

With smartphones impacting everyday routines, it was essential for the radio industry to catch up with the times. Applications on the App Store and Google Play Store allow consumers to listen to their favorite radio stations anytime, anywhere. The industry has done a tremendous job of adjusting. To put the demand for smartphones into perspective, the Pew Research Center analyzed how many Americans own smartphones, “Nine-in-ten or more Americans ages 34 and under have had a smartphone since 2015, while the ownership rate among the 50-and-older age group has risen from 53% to 67% over the same period (Taylor & Silver, 2019).”

The main concern of radios future was how the younger generation was going to tune in on a weekly basis. Even with the amount of people that tune into the radio via their smartphones on a daily basis, there still cause for concern. It turns out that perhaps the biggest threat to radio is not advancements in technology, but another broadcasting media platform that has gained traction over the course of the past five years or so.

Podcasts have become commonplace, not just for radio personalities or celebrities, but ordinary people as well. People create Podcasts to express their thoughts about subjects that are important to them. However, Podcasts do not play music. Podcasts primarily focus on current events. The New York Times publishes an episode every day during the week. Also, NPR has multiple Podcast channels in which they publish episodes every hour the keep the audience caught up with the latest news and events. Podcasts as well as music streaming services update their applications regularly to allow for the best customer experience.

According to the Pew Research Center, “17% of those 12 and older said they have listened to a podcast in the past week, up from 7% when this was first measured in 2013” (Audio

and Podcasting Fact Sheet, 2018). These numbers are far from staggering, but there is a trend in the increased use of listeners on Podcast applications.

While Podcast are a threat to the *traditional* radio industry, radio still offers something that Podcasts do not; live broadcasting. Live broadcasting is not yet enabled on Podcast platforms. Some podcast shows will stream live on YouTube, but podcast platforms such as the Apple Podcast application or Spotify, they are currently unable to stream live audio. For people that enjoy listening to NPR, TED Talks, they are forced to hear news updates every hour rather than every minute.

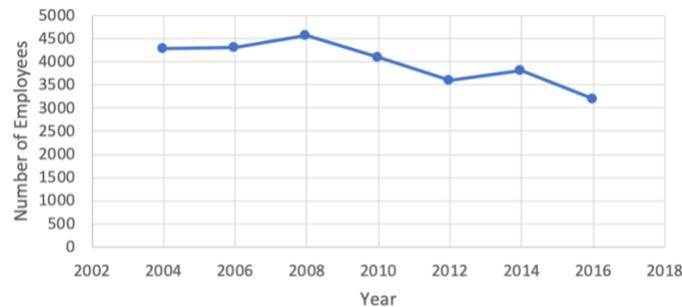
However, podcasts are solving a massive problem that radio is forced to cope with. When listening to Podcasts, listeners have the ability to skip over advertisements. The ability to fast forward with the touch of a button is part of the reason why Podcasts have become so successful. Using the Apple Podcast App as an example, the user has the ability to fast forward at thirty second intervals, allowing the user to skip over advertisements in blazing speed. Podcasts earn revenue the same way radio does; through advertisements. Podcasts take a short period of time to introduce their sponsors and the products that they have to offer. But if the listener is disinterested in the advertisement, listeners have the ability to skip over them.

This is where traditional radio benefits from Podcasts ineptitude. For example, if a sports Podcast is released around noontime but a shocking development happens in the evening, the audience is able to tune in to any radio station to listen opinions

Despite the defects that podcasts still have, traditional radio has suffered from their growing popularity. With the inclusion of Podcasts and digital media, there has been job loss in newsroom employees in the radio broadcasting sector.

However, the sole reason why radio is still alive today is due to the fact that radio stations obtain a significant amount of money each year. In the year 1910, radio had yet to obtain any sort of profitable income. And today, we are noticing a slight drop in jobs in the radio industry.

Table 3  
*Total Number of Newsroom Employees in the Radio Broadcasting Sector*



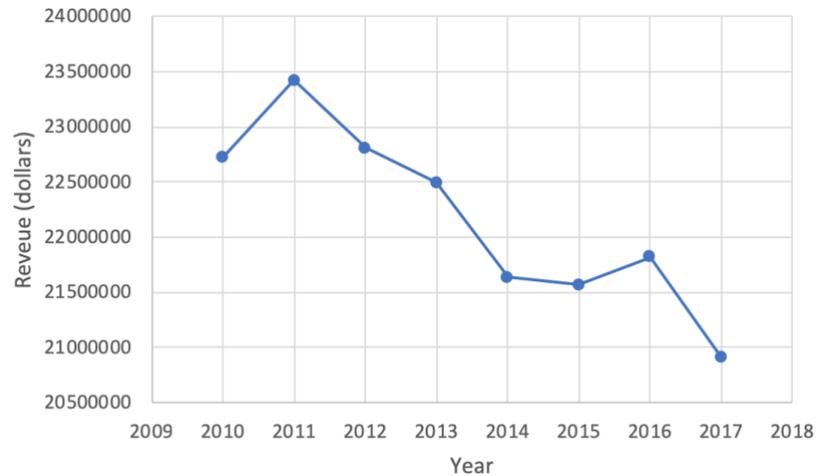
*Note:* Adapted from the *Pew Research Center*. Retrieved July 12, 2018  
From <https://www.journalism.org/fact-sheet/audio-and-podcasting/>

The chart above indicates the decrease in newsroom employees in the radio broadcasting industry. In 2008 there were 4,570 employees. In 2016, the number of employees dropped to 3,190.

Substantial jobs losses directly correlates with revenue loss. Without enough revenue, companies are unable to pay employees. Table three below shows the average station revenue for all-news radio stations.

Table 4

*Average station revenue for all-news radio stations (U.S. dollars)*



*Note:* Adapted from the *Pew Research Center*. Retrieved July 12, 2018  
From <https://www.journalism.org/fact-sheet/audio-and-podcasting/>

The chart above indicates the average station revenue for all-news radio stations. With the job loss that has occurred in the radio broadcasting sector, it should be no surprise to see that revenue is decreasing. According to this chart, in 2010, average station revenue reached \$23,422,000. However, in 2017, the average station revenue dropped to \$20,913,000, a decrease on average of \$2,509,000 over a seven year period.

What society is going through since the iPhone debuted is a technological transformation. Newspapers are now read digitally by many of their consumers. The drastic changes in technology has not only changed how we listen to the radio, but how we consumer all forms of traditional media.

Examining how the car industry has adapted to the modern day is quite interesting as well. Bluetooth technologies are commonplace in essentially every vehicle produced post-2015. Car companies have learned to adapt to the newest and latest trends. However, one of the oldest

forms of traditional media is still installed in every car, that of course being radio. Radio was invented in the early 1900's, yet the compact disk, otherwise known as CD's, was first created in 1982. Car companies have started to go away from CD players despite the fact that they were invented less than forty years ago (Orteza, 2018).

The longevity of radio in the car is an impressive feat. We've seen new audio players invented years after radio was created, and they have been terminated from many new vehicles. Tapes were also created after radios as they were introduced in 1962. However, car companies have terminated tapes in the past ten years or so.

Tesla, an automotive company run by billionaire businessman Elon Musk, was founded in 2003. While having some ups and down throughout the companies short history, they have evoked a vision as to what the automotive industry will look like in the near future. Their cars are argued to be years ahead of its time and have been at the center of the electric car industry.

Consider what a futuristic automotive vehicle would look like. Fully electric, self-driving cars and perhaps touchscreen displays would be included in the vehicle of your imagination. It turns out that all of these features are already included in all of Tesla's vehicles. FM radio is still equipped in each and every one of their cars. Tesla has done away with CD players and old school AM radio, but FM radio is still very much prevalent (Tesla, 2019).

It's clear that automotive companies have made the change to Bluetooth, relying on a smartphone as the main source of media in the car. However, even the most advanced cars on the road today still make an effort to include FM radio dials.

What we know is that the automotive industry has made an effort to keep up with modern day technologies. Tapes and CD's, which were once commonplace in cars, are now exterminated from many vehicles. Marketing teams at these car companies have centered their attention

around the latest and greatest technological features. In fact, Nissan's new slogan is, "Now, the most exciting tech you own is in your driveway." Yet one of the oldest forms of broadcasting is still equipped in all of their new cars. The brand new Nissan Leaf, which is a modern electrically powered vehicle, is still equipped with AM/FM radio (Nissan, 2019).

An LA Times article published in 2014 claimed that there were 253 million cars and trucks on the road that year. If you do the mathematics, nearly 80% of the population owned a vehicle at that time. This means that about 80% of the population has access to radio for no cost whatsoever (Hirsch, 2014).

Perhaps the best feature about radio and why it's implemented in every car is because it's absolutely free. Spotify and Apple Music charge subscribers ten dollars per month for a single user. If you're a college student, the price drops to just five dollars. Music streaming services such as Apple Music and Spotify are excellent applications for music listeners. Their convenience factor, price insensitivity and value has allowed for them to have tremendous success.

The Pew Research Center laid a foundation for radio statistics. The numbers show that even terrestrial radio is still very much relevant with online radio streaming bringing in more listeners every day. With facts present, I still wanted to get a grasp of what my peers thought about the future of radio. I was able to survey nearly sixty college students to get their perspectives on the future of radio and the convenience of the latest and greatest music streaming services. Despite the cost of Apple Music and Spotify, it seems like collegiate students would rather spend money to listen to their favorite songs and artists whenever they desire as opposed to tuning into the radio.

## Methodology

In order to complete this thesis in an effective manner, I included both qualitative data from scholarly articles and quantitative data for the survey that I conducted. To simply have one research method would be ineffective for my overall goal for the thesis. I will have mixed methods, but among the specific research methods I will include are surveys.

Surveys target large groups of people to obtain a significant amount of data. The surveys and questionnaires were presented to primarily students. The idea is to gather data from millennials more than Generation X and Baby Boomers simply because many of those two generations have not yet adapted to the digital age. In order to reach these specific demographics, I printed out about one hundred copies of the survey and handed them out at the very beginning of each of my classes. I emailed my professors prior to class asking for permission to take about five minutes of their class time for individuals to fill out this survey.

It was far better to get answers from Millennials and Gen Z because they are known as digital natives; people who grew up in the digital age. In fact, part of my motivation to write this thesis is to see whether or not millennials are moving away from traditional media. By surveying a number of college students, I have a better grasp of what the future of radio will look like in their eyes.

The questions in this survey were open and closed ended. The goal was to get anywhere from 50-100 individuals to participate in the survey.

## Chapter 4 - Radio Survey

The data provided by the Pew Research Center laid a foundation in the overall basis of this thesis. Their statistical analysis on radio helped form the conclusion to this much debated topic. In order to get a full grasp on radio and its uncertain future, I conducted a survey in which fifty of my peers offered their input on the matter (the survey can be found in Appendix A).

Before the survey had been concluded, I had a general theory on what the results were going to be.

Most of my friends have subscriptions to music streaming services, therefore, I assumed that most of the people surveyed listened to music streaming services the most. Despite my assumption that people listen to music streaming services the most, I still believed that the majority of people *still* listen to the radio. Bridgewater State University has thousands of students that commute to school every day. I assumed that a large portion of these students would listen to the radio to some extent. As far as their overall outlook on the future of radio, I did not expect promising results.

These listening habits and their opinions on the future of radio that I predicted came true for the most part. The most beneficial part of this survey to my thesis was not necessarily their opinions, but their demographics. The outlook of radio and its future will depend on the listening habits of the younger demographic. Luckily for me, I am a college student and the vast majority of people that participated in the survey are around the same age as me. This is what I was hoping for prior to the survey. The future of radio is dependent on the listening habits of younger individuals like myself. Thankfully, the majority of people that were surveyed were in the same

age group as myself. Many of my classmates are about the same age as me; born from 1998-1994. This benefited my research thoroughly.

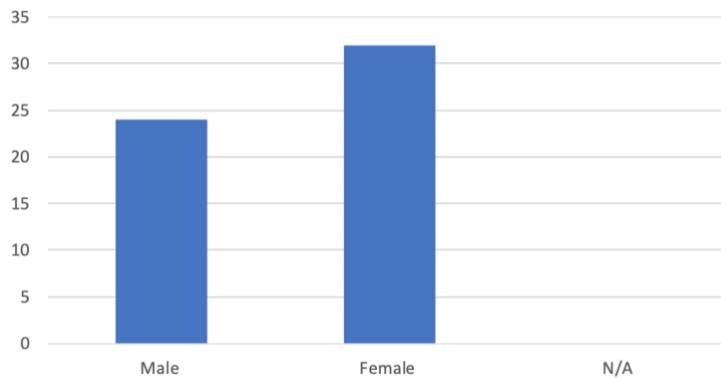
That being said, with the vast amount of millennials that engaged in this survey, many of the answers to the questions in the survey were lopsided, which was predictable. From personal experience, I have noticed that many of my peers have similar listening habits. Music streaming services have taken over the music industry, and as a result, have affected the listening habits of millions of people in the United States.

With all of the statistics gathered from the survey, I have categorized the results into three sections: the first being the demographics, the second being listening habits of those who were surveyed and lastly the knowledge of radio for those who were surveyed. The results are displayed as followed:

**Demographics**

\*Respondents did not answer every question in full completion

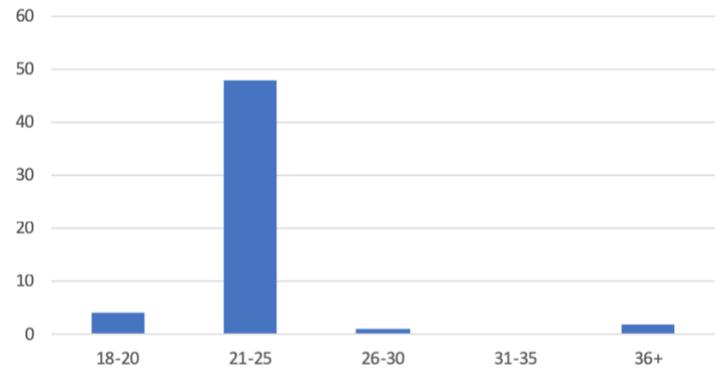
Table 5  
*Gender*



In the “Gender” chart, surveyors were asked to circle their gender with three options: male, female and N/A. There were 32 females and 24 males that participated in the survey. With more females than males, it corresponds with Bridgewater State Universities demographics as BSU has 61% female students to just 39% male students.

Table 6

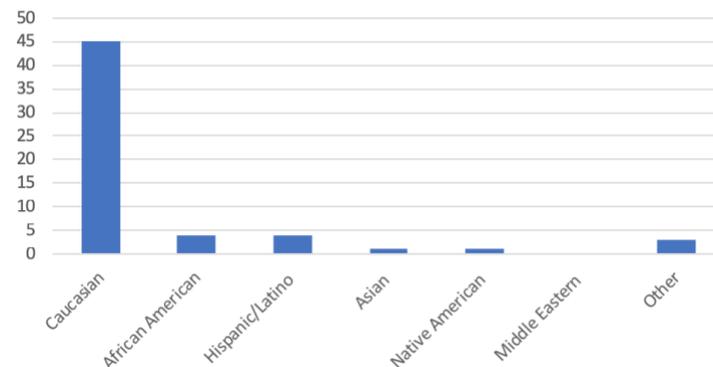
*Age*



In the “Age” chart, the vast majority of participants in the survey were in the age range of 21-25. In fact, 87 percent of those who were surveyed were in the age range of 21-25. An understandable percentile considering the majority of those who were interviewed are college students.

Table 7

*Race*



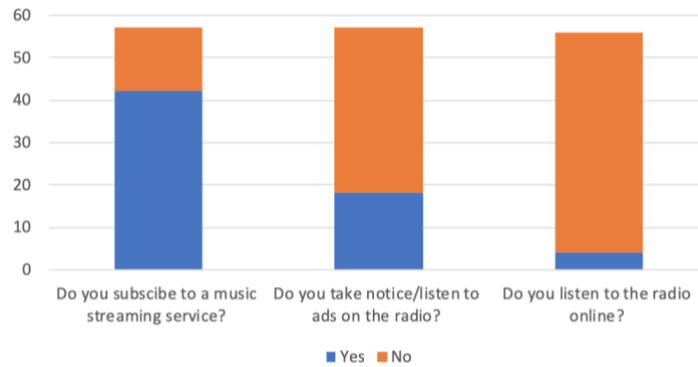
The “Race” chart indicates the bulk of those who were surveyed are Caucasian. This number also makes sense considering the majority of people that were surveyed has the same

major as me (management & communications). 72% business majors are white and 85% of the communications majors are also white.

**Listening Habits**

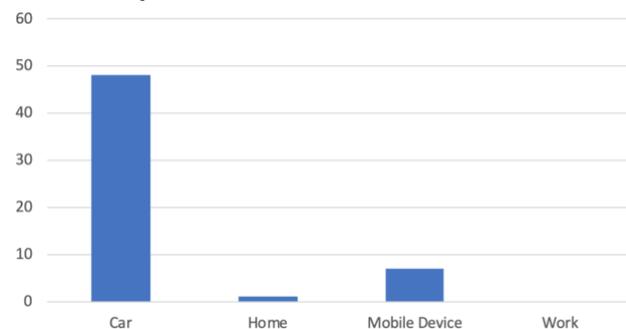
\*Respondents did not answer every question in full completion

Table 8  
*Listening Habits*



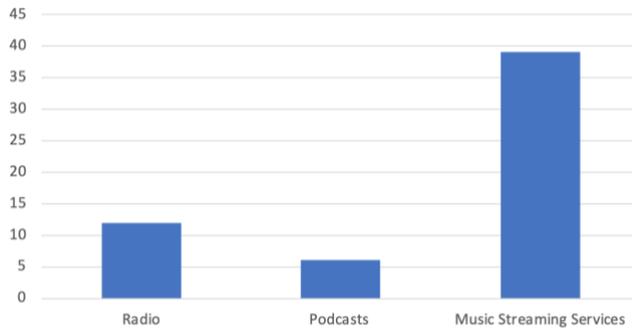
The first bar chart to showcase listening habits are strictly “yes” or “no” questions. 42 persons surveyed subscribe to a music streaming service while just 15 do not. 39 people do not take notice/listen to advertisements on the radio while just 18 do; a growing problem for the radio industry. Lastly, 52 persons surveyed do not listen to the radio online while just 4 do. This goes against the trend the Pew Research Center presented.

Table 9  
*Where do you listen to the radio the most?*



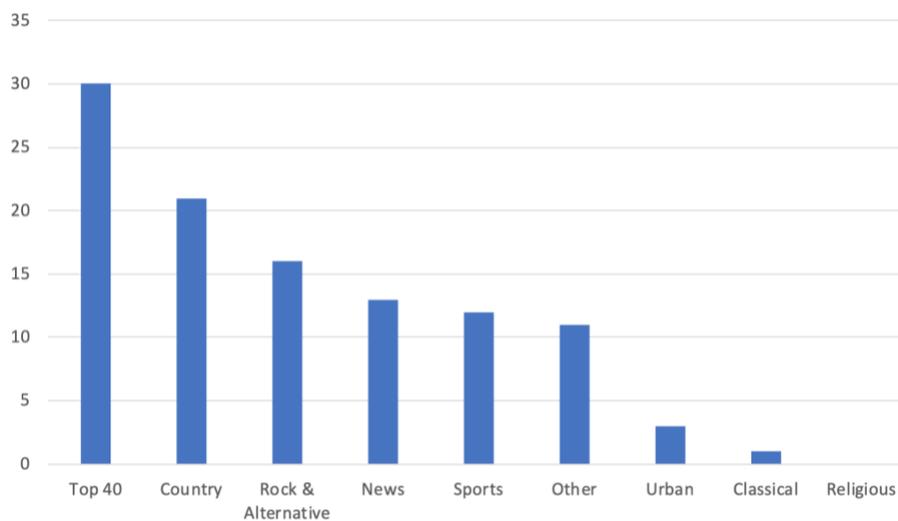
The vast majority of those who were surveyed listen to the radio in their car. 48 people listen to the radio in the car, only one person listens to the radio primarily in their home, and seven primarily listen to the radio on their mobile device.

**Table 10**  
*Which do you listen to more?*



For those who were surveyed, the overwhelming majority listen to music streaming services the most. 39 people said they listened to music streaming services the most while 12 said the listened to the radio the most. Only 6 people said that they listen to Podcasts the most.

**Table 11**  
*What genre of radio do you listen to?*

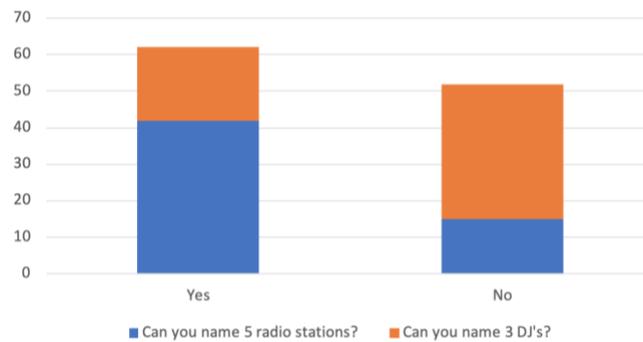


The radio station genre is more diverse than most of the other graphs provided in this thesis. The numbers are as followed, ranked in order from most listened to least listened to:

**Knowledge**

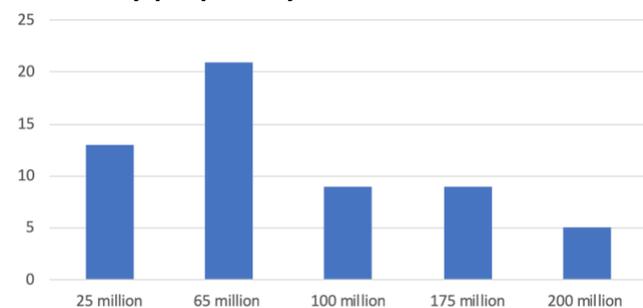
\*Respondents did not answer every question in full completion

**Table 12**  
*Knowledge of Radio Stations and DJs*



This chart showcases two bar charts, seeking the knowledge of radio stations for those surveyed. 42 people surveyed could name 5 radio stations while 15 could not. On the other hand, only 20 people could name 3 DJ's while 37 could not.

**Table 13**  
*How many people do you think listen to the radio in the US?*



*Note:* Respondents did not answer question in full completion

The majority of people who were surveyed, 21 people, believe that 65 million people listen to the radio on a daily basis. 13 believe that 25 million people listen to the radio per day. 9

individuals said that they believe 100 million people listen to the radio per day while 9 people also believe that 175 million people listen to the radio per day. Lastly, there were only 5 individuals who said 200 million people listen to the radio per day.

At the very end of the survey, I asked, “On a scale of 1-10 (10 being the most change), how much do you think radio has changed?” I also mentioned that comments were optional to allow for immediate feedback.

The average answer on a scale of 1-10 (10 being the most change) was a 6.4. By adding all of the numbers and dividing them by the number of respondents, I was able to get the solution.

In general, the respondents believe that radio has changed fairly significantly. The surveyors examined this question in two different ways. Some believe that radio has changed due to the other forms of digital media that have consumed their everyday lives. However, others examined this question without considering the other forms of digital audio. Those who considered radio to change the most offered their comments and scores to showcase how much radio has changed:

One of the individuals gave a score of an 8 out of 10. This person believes the radio has substantially changed and said, “(Radio is) Definitely being absorbed by podcasts”. This makes absolute sense since Podcasts are taking over making a dent in the radio industry. Another person gave another score of an 8 and commented on the lack of variety on the radio, “stations are playing the same music and songs over and over and are losing variety.” This is where music streaming services come in handy. People can choose which songs they listen to and when they listen to it. “Now people stream music,” another person said, who gave a score of a 10. “Streaming services have taken over the way we listen to music,” said another. Another

individual commented said that radio has changed, “due to other music options and new tech”. Another person followed this ‘new tech’ trend by saying radio, “Has to evolve in the digital age to survive”.

These seven surveyors all claimed that radio has changed tremendously due to the new innovations in digital technology. They also mentioned how lack of variety and inconvenience has lead to the drastic changes in radio. However, other participants evaluated this question in a different way. Rather than consider how the perception of radio has change due to technological advancements, a couple of participants took this question at face value. Radio, “Hasn’t changed, that’s the problem.” This person points out the lack of innovation. “I don’t think radio has changed in recent years,” said another.

For these individuals who took this question at face value, they certainly did not consider the transition from radio to podcasts. Radio programs now upload their shows to podcasts in order to keep up with the digital age. There are also application that allow you to listen to the radio in live time such as the TuneIn Radio app.

Input from those who were surveyed helped pave the path for a conclusion. Through this survey, many conclusions have been made as to what the future of radio indicates. Many of the results from the survey were predictable, which is concerning for the outlook of radio. DJs were once a household name that allowed radio stations to prosper and become profitable. Now the majority of people cannot name three DJs.

As someone who grew up listening to the radio on a daily basis, it’s unfortunate that younger generations don’t value the traditional media platforms as much as they used to. However, it’s unfair to say that radio is close to it’s death without analyzing how technology has grown over the years.

## Chapter 5 - What I Learned

This research paper allowed me to dive deep into one of the most groundbreaking communication inventions in history. The “Founding Fathers”, Guglielmo Marconi, Nikola Tesla, Lee DeForest as well as Edward Howard Armstrong, each contributed to in their own ways to create the invention known today as radio. While the process of inventing the final product known as “radio” wasn’t necessarily smooth, the collaborations of each of these individuals lead to one of the most important inventions in modern history. At first the telegraph was created to communicate with people instantaneously from far distances. At the time the telegraph was one of the most important inventions in human history. But human beings have a tendency to explore the unknown and try different things. Imagine using the telegraph today? It would be an incredibly ineffective source of communication. The way in which we live our lives would change drastically. Luckily, the Founding Fathers invented the radio and communication was changed forever. The ability to broadcast over airwaves paved the path for more incredible inventions to come.

After the invention of radio, technological innovations continued to grow. Radio became commonplace in households by the 1940’s and there was no signs of radio broadcasting slowing down. However, the optimism for radios and its future came to a screeching halt in 2007 when Steve Jobs debuted the iPhone.

At first, the iPhone shocked the world being the first ever full screen phone on the market. Steve Jobs summarized the impact that the iPhone would have on the world the day he debuted it to an audience at the 2007 Macworld gathering in San Francisco, CA, Jobs announced,

“We are going to make some history together today (Agar, 2013).” He elaborated on this groundbreaking achievement:

“Every once in a while, a revolutionary product comes along that changed everything...

An iPod, a phone, an internet mobile communicator. An iPod, a phone, an internet mobile communicator ... these are NOT three separate devices! And we are calling it iPhone!

Today Apple is going to reinvent the phone (Agar, 2013).”

Today the iPhone is a household name and it has helped propel Apple to the first trillion dollar company in the world (Clarke, 2018), beating out long-time rival Microsoft as well as Amazon. But while the iPhone has changed Apple’s fortunes, it has also changed the way we go about our everyday lives.

The iPhone has also changed the way in which we communicate with other on a daily basis. You can simply pull your iPhone out of your pocket and stay connected with your friends via social media. In fact, according to the Pew Research Center, in 2018 69% of adults at least one social media site. But what is more prevalent is the use of social media by the younger demographic. 88% of people ages 18-29 use at least one social media site.

This is an important statistic for radio and its future. Many younger individuals are using social media sites and digital content to gather news and connect with others. Rather than tuning into the radio and listening to traffic updates, technological savvy individuals can simply check traffic on their phones via GPS. Also, rather than wait for important news updates to come through on the AM or FM dial, smartphones can access the internet instantaneously, making news updates on the radio less significant.

From a personal standpoint, I learned plenty about how to conduct a more effective survey. While the survey I handed out touched on a lot of important issues in regards to the

outlook of radio, some of the questions could have been more clear and concise. For example, some of my classmates were confused of the question, “What genre of radio do you listen to?” They were confused if they could circle more than one answer. The next time I conduct a survey, I will complete it myself first to make sure every question makes total sense. I cannot assume that every individual that participates in the survey knows exactly how I want it to be completed.

I also learned that I should’ve kept up with the digital times as well. Printing one hundred surveys and handing them out to each of my classmates took a lot of effort. If I had used a website that created surveys such as SurveyMonkey or Qualtrics, I could have saved time for myself. Gathering the statistics physically took a substantial amount of time. SurveyMonkey and Qualtrics automatically generate the statistics for you.

What is most evident from the scholarly articles, data from the Pew Research Center as well as data from the survey, it’s clear that society is going through a technological transformation with the vast amount of digital media platforms that are being produced. The realization is that technological transformations in society are constant. Unless there is a apocalyptic-level event that prevents humans from being the dominant species in the world, technological change will always be constant. Consider the early days of radio when the “Founding Fathers” were attempting to perfect broadcast communication. The very first version of Marconi’s wireless signal across the Atlantic Ocean was groundbreaking, but the technology was far from perfected. In order for radio to enter the homes of many Americans, technological improvements were forced to be made.

For radios purpose, they have adapted fairly well in the digital age. Yes, viewership is down, revenues are lower and employees in the newsroom are decreasing. But they have adapted by integrating old school technology into the digital age.

Consider newspapers, for example. You don't see nearly as many paper boys tossing newspapers on peoples front yards. That's because the newspaper industry has changed as well to keep up with the digital times. Nearly every newspaper has a social media account in which they post a link to articles. Many newspaper companies also offer digital subscriptions. Instead of reading newspaper in the traditional manner, these subscriptions enable consumers to pay a monthly fee to read any article of their choosing. Newspaper is doing what every traditional media platforms is doing; keeping up with the digital times, and luckily radio has done the same.

What I learned is that technology is constantly evolving. Whether radio is coming to an end or not, it's evident that it must evolve to keep up with the modern times. Radio's history has made one thing evident. That the only thing that's constant is change. This is a phrase used when speaking of somebody's life, how the world changes, etc... But even in technology, the only thing we know that will remain constant about technology is that there will always be change. One day there will be a device that is more convenient and more powerful than smartphones. It's hard to imagine, but it's the reality. It seems as though radio will be here for years to come, but it will look different. Just as TVs look different with their "Smart TV" features and just as newspapers have gone digital, radio will also look different.

Appendix A

Radio Outlook Survey

In order to carry out this survey in the most effective way possible, I emailed each of my professors asking permission to hand out a physical copy of the survey in each of my courses. Thankfully, each of my professors were willing to take about five minutes out of their class time to allow the survey to be completed. I also asked my roommates to fill out a survey as well which allowed me to reach a total of fifty-six people.

Below is a screenshot of the survey. It asks has questions for demographic purposes, current listening habits as well as some opinionated questions on the future of radio:

HONORS THESIS									
PLEASE CIRCLE ALL ANSWERS									
Do you listen to the radio?	Yes	No							
Do you think radio is a dying industry?	Yes	No							
Do you subscribe to a music streaming service?	Yes	No							
Can you name 5 radio stations?	Yes	No							
Can you name 3 DJs?	Yes	No							
Do you take notice/listen to ads on the radio?	Yes	No							
Do you listen to the radio online?	Yes	No							
What genre of radio do you listen to?	Sports	News	Country	Top 40	Rock & Alternative	Urban	Classical	Religious	Other
How do you primarily listen to music?	Radio	Cell Phone/MP3	Laptop						
How many times do you listen to the radio per week?	0	1-2	3-4	5-6	7				
How many hours do you listen to the radio per day?	0	1-2	3-4	5-6	7				
Which do you listen to more?	Radio	Podcasts	Music Streaming Services						
Which do you prefer to listen to?	Radio	Podcasts	Music Streaming Services						
What is your gender?	Male	Female	N/A						
How old are you?	18-20	21-25	26-30	31-35	36+				
What is your race?	Caucasian	African American	Hispanic/Latino	Asian	Native American	Middle Eastern	Other		
Where do you listen to the radio the most?	Car	Home	Mobile Device	Work					
How many people do you think listen to the radio per day?	25 million	65 million	100 million	175 million	200 million				
On a scale of 1-10 (10 being the most change), how much do you think radio has changed? (comments are optional)									
PLEASE CHECK OFF BOX FOR CONSENT TO USE THIS MATERIAL TO FUTURE RESEARCH: <input type="checkbox"/>									

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