Impact of the Mobile Phone on Classical Radio

Brenda Barnes
University of Southern California, USA

INTRODUCTION

Fagerberg (2005, p. 4) defines *invention* as the "first occurrence of a new product or process" and *innovation* as the "first attempt to carry it to practice." It was Schumpeter who first made the distinction between invention and innovation (Ruttan, 1959; Pavitt, 1990)--"the inventor produces ideas, the entrepreneur 'gets things done'" (Schumpeter, 1947, p. 152). In the earlier years of his work (Schumpeter Mark I), Schumpeter focused on the role of the inventor/entrepreneur. Later, it became apparent that innovation was more likely to be carried out by firms, not individuals; therefore, the second part of Schumpeter's career (Schumpeter Mark II) focused on the firm and its role as manager of innovation (Freeman & Soete, 1999).

In addition to distinguishing between invention and innovation, Schumpeter described four types of innovation: product innovation, organizational innovation, management innovation, and technological innovation (Pavitt, 1990; Hall & Preston, 1988). Rothwell (1992) adds another category he terms marketing innovations that can include new financing arrangements, a new method of selling, and so forth. Christensen (1997) adds the category sustaining and disruptive technologies or innovations. Sustaining innovations improve the performance of existing products and disruptive innovations offer something new to the marketplace. Christensen's thesis is that failure to recognize the importance and value of disruptive technologies is a leading cause of business failure.

Information and communications technology is a disruptive innovation to radio creating new ways for listeners to access music and creating new competitors for music formatted radio stations. The mobile phone is emerging as a major platform in this arena.

OVERVIEW

This article explores the current dynamic between classical music in traditional media and new media environments with emphasis on the mobile phone and its role in changing the economics of the music business. This is a relatively new field of study; therefore, it is necessary to consider several threads of academic literature. For the development of radio see Erik Barnouw Ph.D. formerly of Columbia University, and Robert W. McChesney Ph.D., University of Illinois at Champaign-Urbana.

For literature about the development of public radio see Jack W. Mitchell Ph.D. of University of Wisconsin Madison and Wick Rowland Ph.D. of the University of Colorado Boulder. For a history of research on cannibalization and convergence see Henry Assael Ph.D. New York University Stern School of Business, Prasad Naik Ph.D. University of California Davis, and Kalyan Raman Ph.D., Northwestern University. The Pew Research Center is an excellent source of information about technology usage.

DOI: 10.4018/978-1-4666-8239-9.ch096

CURRENT SCIENTIFIC KNOWLEDGE INTERSECTING MUSIC AND TECHNOLOGY

The Development of Radio

Radio developed from a chain of technological innovations beginning with the telephone and recorded sound. A number of people in different countries contributed: Edouard-Leon Scott and Charles Cros in France and Thomas Edison in the United States, who is credited with developing the phonograph. American entrepreneur Emil Berliner introduced the first flat-disc record and a method for making shellac copies and in 1895 Edison developed a phonograph purely for home entertainment (his first phonograph was intended more as a dictation machine). Two years later, the first electromagnetic recording system was created by Valdemar Poulsen in Denmark, and in the 1920s the U.S. Naval Research Lab made a series of improvements to this system. However, not until 1926 was electric recording made possible through a microphone and speakers. Plastic tape media was developed in 1937 in Germany.

The other critical series of inventions that made radio possible were electronics, which emerged as a distinct technology around 1900. The first solid-state electronic device was created by Ferdinand Braun in 1874, but there were earlier discoveries that were important: the relationship between electrical conductors and temperature, the photovoltaic effect (which occurs in semiconductors), and photoconductivity. The valve is critical technology for radio, and the first device in which free electronics were put to work was the thermionic valve developed by the father of electronics, Ambrose Fleming. Two years later, Lee De Forest developed the triode valve, which provided the seed of the electronic amplifier and the basic component of radio.

In 1901 Guglielmo Marconi successfully transmitted the first long-distance messages by wireless telephony. His mother took him to England when his native Italy showed little interest in his invention (Barnouw, 1966). In England he formed a company that quickly expanded into the United States. Maurice Leblanc in France, Reginald Fessenden, a Canadian working for the US Weather Service, and Germany's AEG and Telefunken companies were also involved in speech transmission technologies.

Once Marconi demonstrated the power of the new technology, a series of related innovations occurred in a short span. In 1911 Robert Von Lieben in Germany and Edwin Armstrong in the United States developed a triode for the amplification of current and signals. The feedback circuit was discovered in the U.S., the U.K., and Germany in 1912. One year later, Alexander Meissner, Armstrong, and Henry Joseph Round used valves for transmission and in 1914 the Germans accomplished continuous wave transmissions across the Atlantic. AT&T developed the first wireless telephone signals in 1915, an important shift of this technology into American hands. Then during World War I, the U.K. focus shifted to the military while the United States continued on and developed a lead. In the 1920s the work that had been done in electronics since 1874 began to assume industrial and economic significance. In 1920 Westinghouse in the United States and Marconi, then in England, constructed radio stations. In 1933 Armstrong invented frequency modulation (FM) in order to overcome static inherent to AM broadcasting.

During the 1920s, the radio industry began in earnest. In the United States, a new company called RCA was formed to bring together the companies involved in the radio business and to centralize patents. RCA was created, in part, due to discomfort that control of the American radio industry remained in the hands of the foreign Marconi company (Barnouw, 1966).

Two new radio companies were established in the late 1920s–the National Broadcasting Company (NBC) in 1926 and the Columbia Broadcasting System (CBS) in 1927. Because of the proliferation of radio stations broadcasting in the U.S., the Radio Act of 1927 was passed, creating a Federal