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Design and Implementation of a Podcast Recording Studio for Business Communications

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Abstract

Podcasting is the creation of recorded information and its delivery over the Internet, using web syndication technology. Businesses around the world are increasing their use of podcasts as a means for delivering information to their customers and employees.

The purpose of this project paper is to examine the business need for podcasting, and to demonstrate that businesses can assemble an inexpensive recording studio to create podcasts. The review of previous literature included an examination of why podcasting has become important to business communications; how some businesses are currently using podcasting as a communications tool; the technology involved in podcasting; and the tools needed to create podcasts and how web syndication is used to distribute the finished recordings to end users.

The paper includes information on the audio recording software that is necessary to record and edit the podcast. Also included is a discussion of the additional audio hardware such as microphones and mixers that are required to record audio.

Configuring the equipment in the podcasting studio is described. This includes setting up the computer to be used for recording, attaching the audio mixer to the computer, and connecting the microphone to the audio mixer. The installation of the recording software is also described.

The paper concludes with recommendations for businesses to find ways to track the results of podcasts. Also included is a recommendation for further academic study of the uses of podcasting.

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I would like to thank my wife Kris for her constant encouragement and support. Without her I would not have been able to complete this project.

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Chapter 1 – Introduction

The increasing role of podcasting in the business world and the subsequent need for businesses to build inexpensive podcasting studios is examined first in this project. This is followed by an exploration of the technology involved in creating and distributing podcasts to end users. Then the software and hardware requirements for building an inexpensive podcast recording studio are examined.

Need for the Project

The use of various media to communicate has evolved rapidly during the past 20 years. Prior to the advent of the Internet, people received communications through relatively few methods: television, radio, newspapers, books, films, audio recordings, and various forms of interpersonal communication. In most cases, each medium was separate from another medium.

At present, the world, particularly the United States, is moving toward a convergence of media. Advances in technology have allowed video, audio, text, and graphics to reside in the same locations on Web pages across the Internet. In addition, the increasing use of smartphones, iPods, and similar MP3 players, means that this media convergence has become highly portable. Individuals are no longer tied to a television set, radio, or computer to receive media communications. As of 2009, an estimated four billion cellular telephones are in use around the world (Chang, 2009).

In order to stay competitive, businesses must utilize the new technologies to communicate with customers and employees. It is no longer enough for these entities to put a static site on the web and expect that to suffice for their communications efforts in a technologically advanced world. Chase (2009) contends that the media revolution that is

occurring "is unlike anything since 1448, when Gutenberg invented movable type" (p. 27). He

said that the change in media is moving from mass media to one of participation where the lines

between the consumer of media and the producer of media have become blurred. Chase further

states that distribution has changed "from one-to-many to one-to-one" (p. 27).

In regard to audio communications, Scott (2007) said, "By appealing to a niche market

and delivering audio that people choose to hear, an organization is seen as a thought leader and is

the first choice for listeners looking to make a purchase." (Chapter 6 - Audio Content Delivery

through Podcasting, Overview, para. 5)

For example, a 2007 study of various communications channels being used by businesses

showed that 35 percent were using podcasts as part of their communications strategy

("Communication channels," 2007).

By making a minimal investment in a podcast recording facility, a business can quickly

and inexpensively produce these audio recordings as part of an overall multimedia

communications plan.

Advances in digital recording equipment have lowered the barriers to entry for businesses

looking to set up an in-house recording facility. In the past, it was less expensive to rent time at

a recording facility. Building a recording studio was cost-prohibitive for most businesses due to

the amount of equipment that would have to be purchased. Prior to the advent of digital

recording, a basic recording studio could cost tens of thousands of dollars. In addition, setting up

that equipment was a difficult and time-consuming process that often required a professional

audio engineer.

Now that the barriers to entry have been lowered significantly, businesses no longer need

to use outside studios to record audio. For a business that wants to create podcasts as part of its

communications plan, it is far more cost effective to build an in-house recording studio as opposed to renting time at an outside studio.

<div align="center">*Proposed Solution and Project Goals*</div>

The proposed solution is the development of a plan to build an inexpensive in-house podcast recording studio that a business can use to generate podcast recordings.

The goals for the project were to demonstrate that a professional podcasting studio can be constructed for less than $2,000; to research podcasting and the business need for recording podcasts; to research and recommend audio recording software; to research and recommend additional audio hardware, i.e., microphone, and audio mixer; and to recommend computer hardware for audio recording. A recommendation for the computer to be used will be based on its compatibility with the other recommended parts of the podcast recording studio.

<div align="center">*Limitations/Scope of the Project*</div>

The project was limited to only the development of a plan to construct the podcast recording studio. The project was purely a research project, meaning an actual studio was not constructed using this information.

By developing the plan to design the studio, the author was able to analyze the components necessary to construct the studio and determine whether a cost-effective and efficient design could be developed.

Chapter 2 – Review of Literature and Research

The review of previous literature for this project was divided into two areas. The first was research into the reasons for businesses to consider using podcasting as a way to communicate with employees and customers. The other area of review was investigating the technology to create and distribute podcasts to end users.

Definition of Podcasting

A podcast is an audio file that can be downloaded to a computer or a portable audio player. According to Mack and Ratcliffe (2007) the MPEG-1 Audio Layer-3 (MP3) audio format is the most common format used for podcasts because this format can be played back on the vast majority of portable media players and computers. In addition, as noted by Geoghegan and Klass (2005), the small file sizes provided by the MP3 format allow the audio to be downloaded quickly over the Internet. The sizes of the files are reduced through the MP3 compression codec which removes selected bits of the information contained in the digital sound file. According to Geoghegan and Klass (2005), "MP3 codecs try to compress the bits while maintaining fidelity for the human ear" (Chapter 8 - Preparing Your File - Encoding and Compressing to MP3, para. 3).

Business Need for Podcasting

One of the primary benefits for businesses in creating and distributing a podcast is the ability to communicate quickly and easily with employees. According to Agnvall (2006), an increasing number of companies have utilized podcasts to help inform and train employees. He goes on to say those companies have found that employees appreciate the opportunity to learn on their own time and consequently companies find podcasting a cost-effective way to provide this information (para. 8).

Companies such as IBM have also found that using podcasts to communicate with employees can help reduce costs. In 2005, one IBM executive began using podcasting to replace weekly conference calls with his 7,000 employees who were based in various parts of the world. The podcasts, which were produced in-house at IBM, resulted in a yearly savings of $700,000 dollars in conference call charges (Smith-Hopkins, 2005).

Islam (2007) states that combined with other employee training and development, podcasts are effective tools to accomplish a variety of objectives. These objectives include reinforcing and supplementing training that employees have received through other methods. Podcasts can also be used for people who are unable to participate in other training methods; to help employees prepare for certification tests, and to replace portions of training where only non-participatory content delivery is being conducted (p. 39).

At CIT Group, a commercial finance company with more than five-thousand employees, the CEO's weekly conference calls with top management are condensed into 90-second podcasts that are made available to all employees (Davis, 2009). A survey of nearly 1,500 businesses conducted by Buck Consultants and the International Association of Business Communicators found that 57 percent of the businesses either use or plan to use audio podcasts as part of their employee engagement communications (McCasland, 2009).

In addition to using podcasts to communicate with employees, companies can also use podcasting in their marketing efforts. By design, podcasts reach a highly targeted audience. Unlike traditional advertising media in which the message is sent to people not in the target market, podcasts are downloaded by people who are interested in hearing the message (Odell, 2006).

Zucker (2008) said, "For brands, though, podcasting has turned out to be especially effective for timely internal communications (e.g., speeches you missed in the office), customer service (e.g., Whirlpool), business to business and some consumer areas, especially high-interest stuff" (para. 3).

In February 2005, General Motors began producing podcasts describing the company's vehicles in a talk-radio-show style format. General Motors found that within one month its first podcast had been downloaded more than 10,000 times (Couretas, 2005). In August 2005, the General Motors podcast was downloaded 75,000 times (Smith-Hopkins, 2005).

Financial planner J. Brian Preston has had success with a podcast he produces to educate people on investing and financial planning. Within a year of starting his podcast he had more than 1,400 subscribers and found that in the first three days of posting a new podcast on the web it was downloaded 5,000 to 6,000 times (Opiela, 2007).

Ritter and Chang-Hoan (2009) say, "To date, no in-depth academic research has been conducted specifically on podcasting. It is unknown exactly how users interact with or use podcasts, but it is believed that podcasts may deepen the relationship between a brand and consumers" (p. 533). However, they go on to note that since people seek out podcasts on an active and conscious basis that indicates "a high level of involvement with the podcast" (p. 533). They further contend this "high level of involvement in a program is positively related to commercial attention and recall." (p. 533).

Podcast Technology Research

Podcasts are an outgrowth of web logs, commonly known as "blogs," which are web sites that contain regular updates of commentary or news. Blogs can be maintained by individuals or organizations and may focus on a specific topic or can feature a wide range of content. In some

cases, a blog acts as an individual's online diary or journal. Blogs and podcasts both use web syndication technology to allow subscribers to "pull" the information as it is updated.

RSS, or Really Simple Syndication, is a web syndication format used to distribute frequently updated information to end users. Wittenbrink (2005) explains that RSS "encompasses a number of closely connected technologies that identify and find updated or updatable information on the Web, and show and exchange that information." (Chapter 1, 1.3 RSS Requirements, para. 2),

In the early stages of the development of RSS, it was used to automate the distribution of news and other text-based information. Client software and web applications, known as "aggregators" were developed to check multiple web sites on a regular basis, determine when new information was posted to those sites, and then display that information to end users in an easily readable form. It is the method used by many bloggers for distributing updated posts to their subscribers. (Mack and Ratcliffe, 2007)

An RSS page, also known as an RSS "feed," is a web document that is written in Extensible Markup Language (XML) which is a language designed to store and transport data. XML is simply a text file in which the information in the document is surrounded by various "tags." The tags contain Metadata, or information about the information contained in the XML file. (Hunter, 2007)

Generally speaking, podcasting uses the same web syndication technology as blogging to deliver a series of recordings to end users. The recordings can be delivered automatically to computers and MP3 players such as iPods. As new recordings in the series are created and uploaded to the Internet, they can be automatically sent to the "subscribers" to the podcast (Geoghegan and Klass, 2005).

Development of podcasting began in 2000, when Adam Curry, the former MTV Video Jockey (VJ) worked with Dave Winer, the creator of the RSS Feed standard for web syndication, to develop a way to download large audio and video files from the Internet. Winer modified RSS 2.0 to enable a computer to download a new file that had been uploaded to a website. All a content creator needed to do was make the file available for download and individual users could automatically retrieve the file (Haygood, 2007).

As the concept caught on more people began recording files that were then posted on the Internet. Many people who had been writing blogs now began recording their messages as well, creating so-called audioblogs.

Hammersley (2004) coined the term "podcast" to explain the concept of an audioblog. The "pod" portion of the term was due to the popularity of the iPod, although podcasts can be downloaded to any MP3 player or to computers. The "cast" portion of the term podcast came from the term broadcast.

The number of people downloading podcasts grew substantially even in the early days of podcasting. In 2004, podcasts were downloaded by 820,000 people. That number grew to 4.8 million in 2005 (Odell, 2006). By 2013, according to some estimates, 37.6 million people in the United States alone will download podcasts on a monthly basis. That number represents 17 percent of Internet users ("Podcasting goes mainstream," 2009). Meanwhile, podcasting in general is expected to see a 101% compounded annual rate growth through 2010, with an estimated 56.9 million podcast users (Krol, 2005).

According to a 2009 study by Edison Research ("Infinite Dial 2009 Presentation," 2009), 42 percent of Americans own an iPod or other type of MP3 player. The study also found that 43 percent of Americans are aware that audio podcasts are available on the Internet.

Audio Recording Software Research

Audio recording software converts the electrical impulses captured by microphones and other audio input devices into digital data which can be stored on a computer. Recording software works by sampling the electrical impulses it receives from audio input devices and stores those samples as digital data. According to Janus (2004), "Contrary to intuition, the sampling theorem states that a continuous signal can be sampled without any loss of information, and that the original signal can be exactly reproduced from those samples. There are some caveats. To perfectly reproduce the signal, the sampling rate must be more than twice as high as the highest frequency contained in the signal . . . for example, if a signal contains frequencies up to but not including 1,000 hertz, then the signal must be sampled at a rate of at least 2,000 hertz." (Chapter 7 – Digital Audio, Sampling, para. 3)

Since encoding the podcast as an MP3 file removes some of the bits of audio as noted above, recording the audio at a higher sampling rate to start will produce a higher quality finished product. Thus, it is important to use recording software that allows recording at a higher sample rate.

Once the audio is stored as a digital file, it can be edited and modified as necessary by the user. As stated above, the MP3 audio file format is the most common format for podcasts so software that can save an MP3 file will be necessary in any podcasting environment. According to Cochrane (2005), in selecting software to record podcasts a critical feature to consider is the ability of saving the recording as an MP3 file without the need for additional software.

There is a wide variety of audio recording software available including Pro Tools, Audition, Audacity, Garage Band, Cubase, FL Studio, Acid and many others. Since many of these programs were designed for recording music they are often not practical to use for podcast

recording which consists of primarily a recording of a voice or voices and possibly includes music or other sound elements such as sound effects.

Three different audio recording applications were considered as part of this project. The applications were Audacity, Adobe Audition, and Pro Tools. These three applications are widely used by recording studios, voiceover professionals, musicians, and radio and TV stations. They were also the applications most often cited in articles and books about podcasting used in this research. Appendix A details the Audacity application; Appendix B covers the Adobe Audition program, while Appendix C provides information about Pro Tools.

The three recording applications considered for this project allow multitrack recording, which is the ability to create multiple tracks of audio that can then be combined into a single file. For example, one track can be recorded with only a voice; another track can contain music, while a third track can contain sound effects. When the podcast is created, those individual tracks are combined, or "mixed down," into a single file. Listeners of the podcast will hear all the elements – voice, music, and sound effects – as a complete recording. Businesses that use multiple tracks of audio can create a more interesting and professional sounding podcast, compared to those that contain only a voice.

As shown in Table 1, Adobe Audition allows recording at the highest sample rate. Also, Table 1 shows that Audition is the only software considered that includes the ability to save files in the MP3 format without any additional encoders needing to be installed.

Table 1: Comparison of audio recording software

Software	Operating System	Ability To Save MP3 file	Highest Sample Rate	Retail Price
Audacity	Windows/Mac/ Linux/Unix	No, unless separate MP3 encoder is installed	96 kHz	Free – open source
Adobe Audition	Windows	Yes	192 kHz	$349.00
Pro Tools	Windows/Mac	No, unless MP3 license is purchased	96 kHz	$495.00 includes required peripheral (Mbox 2)

Audio Hardware Research

Along with the software necessary for recording and editing audio, there are additional items that are required to record podcasts. Those items include microphones, mixers, monitors (speakers), and headphones.

Microphones are needed to capture the spoken part of the podcast. Mixers combine different audio sources and route them to the recording device, which in this case is a computer. Speakers and headphones are necessary for monitoring the recording process and listening to the finished production.

Microphone Research

Microphones convert the changes in air pressure due to sound waves into electrical current which is then routed to a recording device. The part of the microphone that converts the sound waves to electrical signals is called the transducer and can also be referred to as the

capsule. The capsule contains a diaphragm which captures the sound waves. The movement of

the diaphragm is converted to electrical pulses (Janus, 2004).

The higher the quality of the microphone, the better the quality of the audio recorded.

There is a wide price variance in microphones ranging from less than $100 to thousands of

dollars. For the purposes of podcasting, there are high quality microphones available at lower

price points.

There are two primary types of microphones available – dynamic microphones and

condenser microphones. Other highly specialized microphones, such as laser microphones used

by police departments in surveillance, are not considered.

In a dynamic microphone, a coil of wire is suspended in a magnetic field. The coil of

wire is attached to the diaphragm. As the sound waves cause the diaphragm to vibrate, the coil

moves back and forth in the magnetic field and creates an electrical signal. A condenser

microphone contains two plates with an air gap or insulating material between the plates. The

diaphragm acts as one plate, while the other plate is fixed. As the diaphragm vibrates in

response to sound waves, the capacitance of the plates varies. An external power source

connected to the capsule converts that variation in capacitance to an electrical signal (Janus,

2004). A condenser microphone requires a power source to operate. That power can be supplied

by an internal battery or through a method called phantom power.   Often, that phantom power is

available through the mixer to which the microphone is attached.

The direction from which microphones capture sound is called the directional response or

pickup pattern. Omni-directional microphones pick up sound from all directions. Directional

microphones pick up sound from certain directions but cancel out sound from other directions.

Directional microphones may be bi-directional, meaning they pick up sound from the front and

rear but not from the sides. Cardioid microphones have a heart-shaped pickup pattern that captures sound primarily from the front, while picking up less of the sound from the sides and a minimal amount of the sound from the rear. Some microphones allow the user to change the pickup pattern of the microphone with a switch or dial on the microphone (Mack and Ratcliffe, 2007).

For the purposes of podcasting, a microphone with a cardioid pickup pattern will be the best choice since it captures sound primarily from the front. This will eliminate the need for extensive sound proofing in the studio where the podcasts will be recorded. Since the goal of the project is to construct a complete podcasting studio for less than $2000, only microphones priced at $150 or less were considered. In addition, since many microphones are designed primarily to capture sound from various instruments such as guitars and drums, focus was placed on microphones designed to capture vocals.

Table 2 shows six microphones that are designed to capture vocals. Each of the microphones has a cardioid pickup pattern, with one microphone able to switch between various pickup patterns. As shown in Table 2, the Shure SM58 is the lowest priced microphone which meets the specifications of the project. Its frequency response is well within the range for capturing human vocals, since human speech generally occurs within the frequency range of 100 to 5,000 (Hz) hertz (Bates and Gregory, 2000).

Table 2: Comparison of microphones

Microphone	Type	Pickup Pattern	Frequency Response	Retail Price
Shure SM58	Dynamic	Cardioid	50-15,000 Hz	$99.97
Samson Q8	Dynamic	Cardioid	50-16,000 Hz	$129.97
Rode M1	Dynamic	Cardioid	75-18,000 Hz	$149.97
Audio-Technica AT2020	Condenser	Cardioid	20-20,000 Hz	$99.97
AKG Perception-120	Condenser	Cardioid	20-20,000 Hz	$119.97
Samson CL8	Condenser	Switchable	20-20,000 Hz	$149.97

Mixer Research

An audio mixer, or mixing desk, is used to combine various sources of audio into one signal that is then routed to the audio recording device. Each audio source can be plugged into its own channel with individualized control over the volume setting of the device. For example one microphone is plugged into one channel, a second microphone is plugged into a second channel, and a compact disc player is plugged into a third channel and so on. Mixers generally have multiple outputs for the combined audio, i.e., headphones, studio monitors, and master mix. As mentioned above in the discussion of microphones, many mixers also contain a phantom power supply to be used with condenser microphones. Many newer mixers have a FireWire or USB output which allows the mixer to be connected directly to the work station without the need for a soundcard or audio interface.

Table 3 shows a comparison of recommended mixers for a basic podcast studio. Because the scope of this project was to build a complete podcasting studio for less than $2,000, mixers priced above $300 were not considered. In addition, only mixers with USB output were

considered. Having a USB output will eliminate the need for considering soundcards or audio

interfaces, thereby reducing the cost of equipment to build the studio.

Table 3: Comparison of mixers

Mixer	Channels	Mic Channels	OS Compatibility	Retail Price
Alesis MultiMix 8 USB	8	4	Win XP/Vista - Mac OSX	$159.97
Behringer XENYX-1204FX	6	4	Win XP/Vista - Mac OSX	$179.99
Peavey PV 10 USB	8	6	Win XP/ME/2000 & Mac OSX	$299.99

Computer Hardware Research

Cochrane (2005) says that generally speaking a PC running at least Windows XP or a

Mac with OSX will allow audio recording. He says the minimum requirements for a PC are

Windows XP/2000, a Pentium 4 processor, 512 MB of RAM, 3 to 4 GB of free space on the hard

drive, a sound card with Line Out/Line In. For the Apple platform, Cochrane says that the

minimum standard is a a Mac Mini with 512 MB of RAM. As noted above, selecting a mixer

with either a FireWire or USB connection will eliminate the need for a sound card in the

computer since the mixer then operates as the sound card passing the audio signal from the

pickup devices to the recording software.

Chapter 3 – Methodology

Selection of Podcast Studio Components

This project was conducted strictly as a research project into podcasting and the design of a podcast studio.

A budget of $2,000 was set for purchase of computer hardware and software, and audio hardware and software.

The audio recording software chosen for the podcasting studio was Adobe Audition. This choice was based on two primary criteria, the sampling rate available and the ability of the software to save recordings in the MP3 format without the need for additional software.

Adobe Audition offers a sampling rate of 192 kHz while the other software considered had a lower sampling rate of 96 kHz. As discussed earlier, the higher sample rate will allow the creation of better quality recordings.

During the review of literature it was noted that the ability to save the recordings as MP3 files without additional software was a priority as well. Since the MP3 format is the most widely used format for podcasts, this is an important feature for a podcasting studio. Audacity requires the installation of the LAME MP3 encoder, while Pro Tools requires the purchase of an additional license in order to save files in the MP3 format. Adobe Audition includes the ability to create MP3 files as part of the application. Consequently Audition is a better choice in this regard.

The microphone selected for the podcast studio was the Shure SM58. The microphone in the podcasting studio will be used exclusively for capturing human speech. The Shure SM58 features a frequency response that covers the range of the human voice. Also, the Shure SM58 was the lowest priced of the dynamic microphones that were researched.

The mixer chosen for the podcasting studio was the Alesis MultiMix 8 USB. This was the lowest priced mixer of the three mixers considered in this project. This mixer has four inputs for microphones, which means that in the future additional microphones could be added to the studio so that the podcast host can conduct interviews with guests, or a co-host could be added to the podcast program. Since this mixer has a USB connector, this will also eliminate the need for a soundcard in the computer as the mixer will operate as a soundcard, sending the audio signal from the microphone to the recording software. Appendix D shows how the microphones are connected to the mixer and how the mixer is connected to the computer and the studio monitors. Complete specifications for the Alesis MultiMix 8 USB are shown in Appendix E.

The choice of Adobe Audition as the recording software means that a PC running the Windows operating system is the default choice of a computer. Adobe Audition only runs under the Windows OS.

Typically Windows-based computers are less expensive than Mac-based computers with comparable features, so choosing a Windows PC will also help keep the project within budget.

There is a wide variety of PCs in the marketplace and many "off-the-shelf" models would be adequate for a podcast studio. However, a PC designed primarily for audio recording was better suited for this project.

Sweetwater.com, a large online retailer of musical instruments and recording equipment, offers a line of computers called the Creation Station. The Creation Station computers are custom built for audio recording.

The recommended computer for this project is the Creation Station Tower LE. Table 4 shows the minimum system requirements for running Adobe Audition and the system specifications for the Creation Station Tower LE. As Table 4 shows, the Creation Station

computer meets or exceeds the minimum requirements for the Adobe Audition audio recording

application.

Table 4 Minimum system Requirements for Adobe Audition compared to specifications of selected computer

Adobe Audition System Requirements	Creation Station Tower LE Specifications
Intel® Pentium® 4 (1.4GHz for DV, 3.4GHz for HDV); Intel Centrino®; Intel Xeon® (dual Xeon 2.8GHz processors for HD); or Intel Core™ Duo or compatible processor (SSE2-enabled processor required for AMD systems)	Pentium Dual Core 2.50GHz/800MHz FSB
Microsoft® Windows® XP Professional or Home Edition with Service Pack 2, Windows Vista® Home Premium, Business, Ultimate, or Enterprise, or Windows 7 (certified support for 32-bit editions and 64-bit compatible)	Vista Home Premium 32-bit
512MB of RAM (1GB for DV playback; 2GB for HDV and HD playback)	2GB
10GB of available hard-disk space (when used with Loopology DVD)	Seagate 500GB SATA hard drive
DVD drive required for installation	DVD+/-RW

The Creation Station Tower LE is available through Sweetwater.com for $999.97. While this is the most expensive part of the podcast studio, it is also the most critical part of the recording studio. There may be other off-the-shelf computers that are less expensive, but unlike the Creation Station computers, they are not optimized for recording audio.

Along with using processors that have been tested to run optimally with Windows-based audio recording software, the Creation Station computers are constructed using components that are designed to reduce or eliminate noise from the computer. The computer includes a quiet power supply in addition to an Intel Reference CPU cooler. Also, to prevent vibrations of the computer from creating noise, the Creation Station computers contain Auralex Sheetblok-Plus, a

sound isolation barrier. Appendix C lists the full specifications of the Creation Station Tower

LE.

Most off-the-shelf computer monitors would be acceptable for the podcast recording

studio. Sweetwater.com also has a computer monitor that is compatible with the Creation

Station Tower LE. The V7 D19W12A monitor is listed at less than $200 which makes it

affordable within the project goals.

Additional Recommended Items

As mentioned above, the podcast studio needed studio monitors (speakers) and

headphones. These are required to monitor the recording and playback of the audio recordings.

Since the podcasting studio would not be used to produce high-quality recordings such as music,

inexpensive monitors and headphones were the best choice.

Using an online source for recording equipment, a wide variety of monitors was available

for just under $100 for a pair, and a large number of headphones were also available for just

under $50 as well. The Samson MediaOne 3A studio monitors priced at $99.97 a pair were

chosen. For headphones the Audio-Technica ATH-M3X headphones priced at $34.97 a pair

were selected.

Microphone cables are needed as well to connect the microphones to the mixer. Good

quality microphone cables were available for $20 or less. A Monster Cable S100M5 microphone

cable was the one selected for this project.

Cost of Implementing Recommended Solutions

Based on the solutions presented above, Table 5 illustrates the total cost of the

recommended solution. The prices listed are retail prices through an online vendor and do not

include tax or shipping costs because these vary based on the location of the company building

the podcasting studio. The total cost shown in Table 5 is less than the amount specified as the

maximum budget for the project.

Table 5 Cost of implementing recommended solutions

Item	Description	Units	Unit Price	Total Price
Adobe Audition	Recording software	1	$349.00	$349.00
Shure SM58	Microphone	1	$99.97	$99.97
Alesis MultiMix 8 USB	Mixer	1	$159.97	$159.97
Creation Station Tower LE	Computer	1	$999.97	$999.97
V7 D19W12A	Computer monitor	1	$189.97	$189.97
Samson MediaOne 3A	Studio monitors	1 pair	$99.97	$99.97
Audio-Technica ATH-M3X	Headphones	1	$34.97	$34.97
Monster Cable S100M5	Microphone cables	1	$19.95	$19.95
Total				**$1953.77**

Assembling the Podcast Studio Components

Putting the podcast studio should be a relatively simple process. As discussed in section

above on microphones, the Shure SM58 has a cardioid directional pickup pattern. This means

that it picks up sound that is primarily directly in front of the microphone. Also, since recording

a podcast is different than recording music in a sound treated studio, the podcast studio will not

need extensive sound treatment. A relatively quiet location should be chosen, but it will not be

necessary to build a specific recording booth.

The first step in assembling the podcast recording studio is setting up the computer to be

used for recording. The Creation Station LE features a USB keyboard and a USB mouse. Each

of these should be plugged into the computer. The next step is to plug the USB connection from

the Alesis MultiMix 8 USB into the computer. The V7 D19W12A computer monitor includes a

monitor cable and this should be attached between the monitor and the computer. Finally, plug

the power cable into the Creation Station and into an electrical outlet.

The next step will be to connect the microphone to the mixer using the Monster Cable S100M5 microphone cable. The female end of the cable should be attached to the microphone and the male end of the cable should be plugged into the mixer. The Samson MediaOne 3A studio monitors will be connected to the mixer by plugging the cables into the jacks labeled CTRL RM OUT. Finally the Audio-Technica ATH-M3X headphones should be plugged into the mixer by connecting them to the PHONES jack. Appendix D features a simple diagram of how to connect the components to the mixer and how to connect the mixer to the computer.

The User Manual for the Alesis MultiMix 8 USB includes the following advice: When powering up both your computer and the MultiMix, turn on the MultiMix first and the computer second. When powering down your computer and the MultiMix, turn off the computer first. Wait to turn off the MultiMix until the computer has shut down.

Installation of the Adobe Audition software is the final step in setting up the podcast recording studio. The installation CD should be inserted into the computer and the installer will start automatically. Appendix G contains the Read Me file included with Adobe Audition 3.0 which includes instructions on installing and registering the software.

Creating Podcasts

This project does not include the actual recording of podcasts, but there are number of things that should be considered before podcasting begins. Among those for any business will be who will be responsible for creating the podcasts, what topics will be covered, what should be the length of the podcasts, and with what frequency will the podcast be produced?

Through all of the research for this project no simple answers for these questions could be found. There were examples of podcasts that ran only a minute or two, to those that were an

hour long. In some cases podcasts were produced on a weekly basis, others were monthly or

quarterly and some were daily.

Some podcasts are designed to train and inform people while other podcasts are intended

to help market a particular company's products or services. Some companies use podcasts to do

both marketing and employee communications.

Any business that is considering producing podcasts will first need to determine the

purpose and goal of the podcast. Also to be considered is the intended audience for the podcast.

As to who in an organization should be responsible for creating podcasts, again this will

depend largely on the purpose of the podcasts. For example, if podcasts are being used for

employee training and internal corporate communications it may be best to have someone in the

human resources department responsible for generating the podcasts. On the other hand, if the

podcasts are part of the company's marketing and advertising strategy, it would likely be best for

a marketing employee to produce the podcasts.

In terms of content for the podcast, again, this would vary from company to company.

Writing a script for the podcast would most likely be beneficial in the early stages of a

company's venture into podcasting. A prewritten script would be especially important for

podcasts designed for employee training purposes to ensure that the appropriate information was

being passed along to employees. Having a script would also keep the podcast more tightly

focused on the information to be delivered and would keep the participants from wandering off-

topic.

For a large organization that is using podcasts for both internal and external

communications, it may be beneficial to hire someone who is strictly responsible for the

production of the podcasts. That individual would then communicate with the various

departments that are using podcasts. For example, the "Podcast Producer" would work with the

Marketing Manager on creating podcasts which are part of the marketing message of the

company. For podcasts that are used for employee training or communication, the "Podcast

Producer" would collaborate with the Human Resources Manager.

It would be impracticable to address all the possibilities that might be encountered in the

production of a podcast without knowing exactly what a company is trying to accomplish with

its podcasts. In addition, a company that finds podcasting successful in one subject area may

look to create additional podcasts covering other topics. However, in all likelihood the same

formula used for a marketing podcast would not work for an employee training podcasts.

Therefore any company producing podcasts will need to be flexible and adaptable in how it

creates its podcasts.

Chapter 4 – Project Analysis and Results

Were Project Goals Met?

The first goal of the project was to demonstrate that a professional level podcast recording studio could be built for no more than $2,000. As Table 5 above shows, the studio can be assembled for $1,953.77 for the basic equipment.

Another project goal was to investigate podcasting in general and determine if there was a business need for podcasting. This was accomplished and demonstrated in the Literature Review section of the project paper. The number of podcasts and the people accessing podcasting continues to grow and shows no signs of slowing down in the foreseeable future. Also, it increasingly is becoming a way for businesses to communicate quickly, effectively, and inexpensively with their customers and employees. The ability to target specific groups of individuals with content that is interesting and relevant to them makes podcasting an excellent communications tool for many businesses. The IBM example of saving $700,000 a year in conference call costs is just one example of how a business could use podcasting to save money.

The project also successfully demonstrated that there is a range of recording software and hardware that is inexpensive and can be used in an in-house recording studio. This lowers the barriers to entrance for companies that want to create their own podcasts.

Chapter 5 – Project History

Research for this project began in August 2008, with a review of previous literature. This review began with a search for articles and books specifically about podcasting and how businesses were using them to communicate with employees and customers. In order to determine whether there was a need for this project, it was important to learn whether businesses were indeed including podcasting as one of their communications tools.

Then additional research was done by searching for published material to investigate the technology for recording podcasts. This research included material about recording software, and audio hardware such as microphones and mixers. Material specifically related to the technology involved in digital recording was included in this portion of the research. The initial phase of research continued through the remainder of 2008 and throughout 2009.

A second phase of research was undertaken in January, 2010. This phase included further investigation into how businesses were using podcasting as one of their communications tools, research into the technology used to deliver podcasts to users, and the development of final design of the podcasting studio.

Chapter 6 – Conclusions

Podcasting is still in its infancy, but at the present time it appears that it is a technology that will continue to grow for the foreseeable future. People continue downloading podcasts on an increasing basis.

As discussed above, the fact that people seek out podcasts means they have more involvement with the information contained in those podcasts. This provides an opportunity for businesses to use this technology to distribute information on a one-to-one basis to people who are interested in that information. This is a more effective way to communicate than the previous one-to-many method where some people who hear the message are not interested in the information.

In addition, as noted in the Literature Review section, companies like IBM have found that using podcasting helps save money. While the savings in that case are related to eliminating conference call costs, different companies might see savings in other ways such as by eliminating costs for printed material. It is important for companies who use podcasting to analyze the cost-benefit involved with podcasting.

For companies that undertake podcasting it is important to track the results of those podcasting efforts. A business needs to know in advance the purpose and expected result of the podcast. It then should make an effort to see if those results are being met. For example, if a goal of the podcast is increase scores on a certification test, the scores of those who have listened to the podcast should be compared to those who have not listened. If a company is using a podcast to increase the sales of a product, the company should track sales that come directly as a result of the podcast.

As noted by Ritter and Chang-Hoan (2009), there has been very little academic research conducted on podcasting. It seems like there is an opportunity to conduct many different studies on podcasting. Studies could be conducted on what attracts people to a particular podcast, what kind of information they want from a podcast, whether they are alienated by a marketing message in a podcast. Additional studies could be conducted on how long individuals subscribe to podcasts and what causes them to cancel a subscription.

From a human resources standpoint, academic research could be conducted into whether podcasting helps train employees faster, whether podcasts are truly an effective way to communicate company information, and whether employees prefer listening to a podcast rather than reading printed material.

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Appendix A

Audacity is an open source audio recording software package that is available free on the Internet at http://audacity.sourceforge.net. Audacity contains many of the same features that are found with other recording software available for purchase.   The application is distributed under the GNU General Public License (GPL). Volunteer developers continue to work on the application, adding new features and fixing bugs found by users. Audacity runs on multiple platforms including Mac OS X, Microsoft Windows, and GNU/Linux.

Audacity can be used to record audio from microphones, line input (used for musical instruments) and other audio sources. Audio can be recorded on 16 channels at the same time. Files in MP3 format can be imported and exported after downloading and setting up an open source MP3 encoder called LAME.

The program also allows editing of files using Cut, Copy, Paste and Delete features which are similar to other recording software. The application allows an unlimited number of Undo steps. Users can edit and mix an unlimited number of tracks.

Figure 1 shows the Audacity interface with a series of audio tracks loaded into a multitrack session. Each of these tracks can be recorded and edited individually. These multiple tracks can be mixed down into a single audio track which can then be saved as an MP3 file and loaded onto a website for distribution as a podcast.
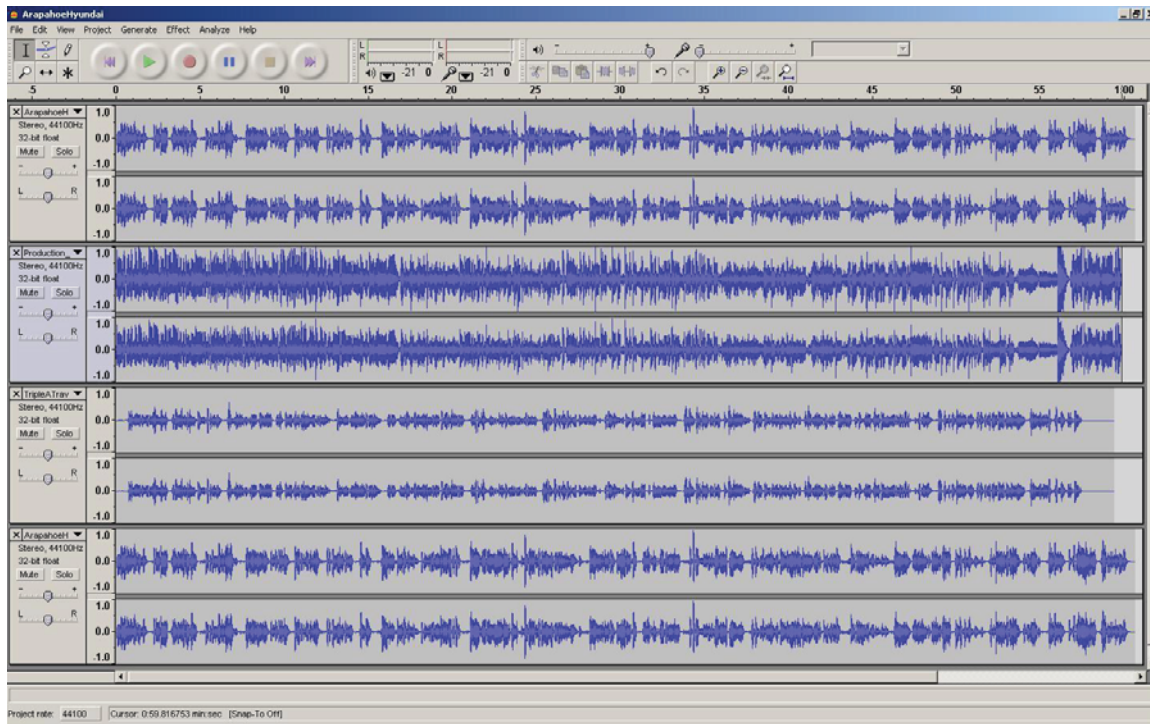
Figure 1: Screen shot of the Audacity audio recording program.

Table 6 shows the system requirements for running Audacity on Windows computers. To run the latest version of Audacity on Mac computers requires Mac OS X 10.1 or later. For Linux and Unix platforms, the Audacity website recommends using the latest distribution that is compatible with the particular hardware specifications. It is also recommended that the Linux or Unix computer have at least 64 MB of RAM and a 300 MHz processor.

Table 6: System requirements for Audacity audio recording software

Windows version	Recommended RAM/ processor speed	Minimum RAM/ processor speed
Windows 98, ME	128 MB / 500 MHz	64 MB / 300 MHz
Windows 2000, XP	512 MB/1 GHz	128 MB/300 MHz
Windows Vista Home Basic	2 GB / 1 GHz	512 MB / 1 GHz
Windows Vista Home Premium/ Business/Ultimate	4 GB / 2 GHz	1 GB / 1 GHz

While the Audacity recording software is available free of charge, there are disadvantages such as limited support and bugs which may or may not be fixed. Some users have reported losing their recordings when the software or the system crashed (Geoghegan and Klass, 2005).

Appendix B

Adobe Audition was originally developed by Syntrillium Software as a program called Cool Edit. Adobe Systems purchased Cool Edit from Syntrillium in May 2003 and rereleased the program renamed as Adobe Audition.

Adobe Audition can record from microphones, line inputs (for musical instruments) and other audio sources. Up to 80 separate live audio sources can be recorded simultaneously.

Once the recordings have been made, the files can be edited using common commands such as Cut, Copy, Paste, and Delete. The individual audio tracks can be included in a multitrack session and mixed down to create a single track. For example, Adobe Audition can be used to record a voice track, a music track and a sound effects track. Those tracks can then be combined into a single audio file that can be used for a podcast.

The software also has more than 50 digital signal processing tools built into the application. This allows the user to add echo, reverb, and other audio effects to tracks that have been recorded. There are also many audio processing plug-ins available on the Internet that can be added to Audition. Some of these plug-ins are free, while others are paid applications.

Figure 2 shows a screenshot of a multitrack session in Adobe Audition. There are eight tracks shown, although Audition can handle an unlimited number of tracks in the multitrack portion of the application. The individual sound files in the pictured multitrack session can be mixed down to a single audio track and saved as an MP3 file to be used as a podcast.
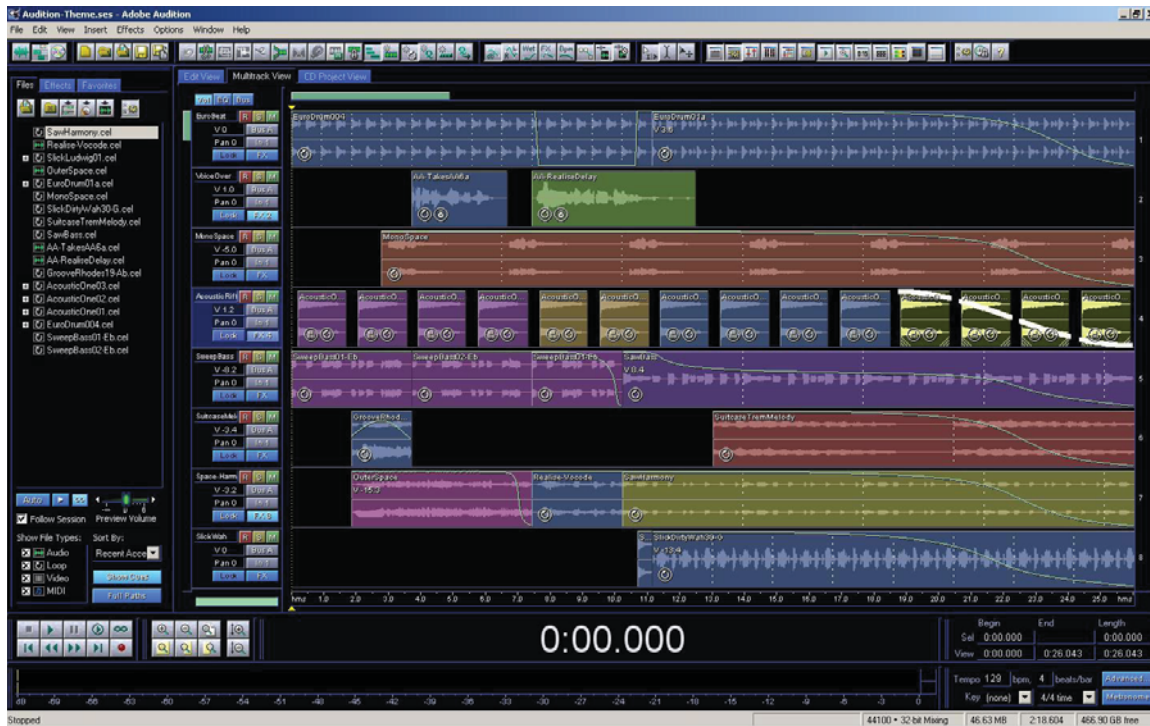
Figure 2: Screen shot of Adobe Audition multitrack session.

In addition to working with audio files in the multitrack view as shown in Figure 2,

Adobe Audition allows users to work with individual files in a single track view as shown in

Figure 3. This makes it much easier to edit and fine tune the individual file using the various

audio processing tools that are native to Audition.
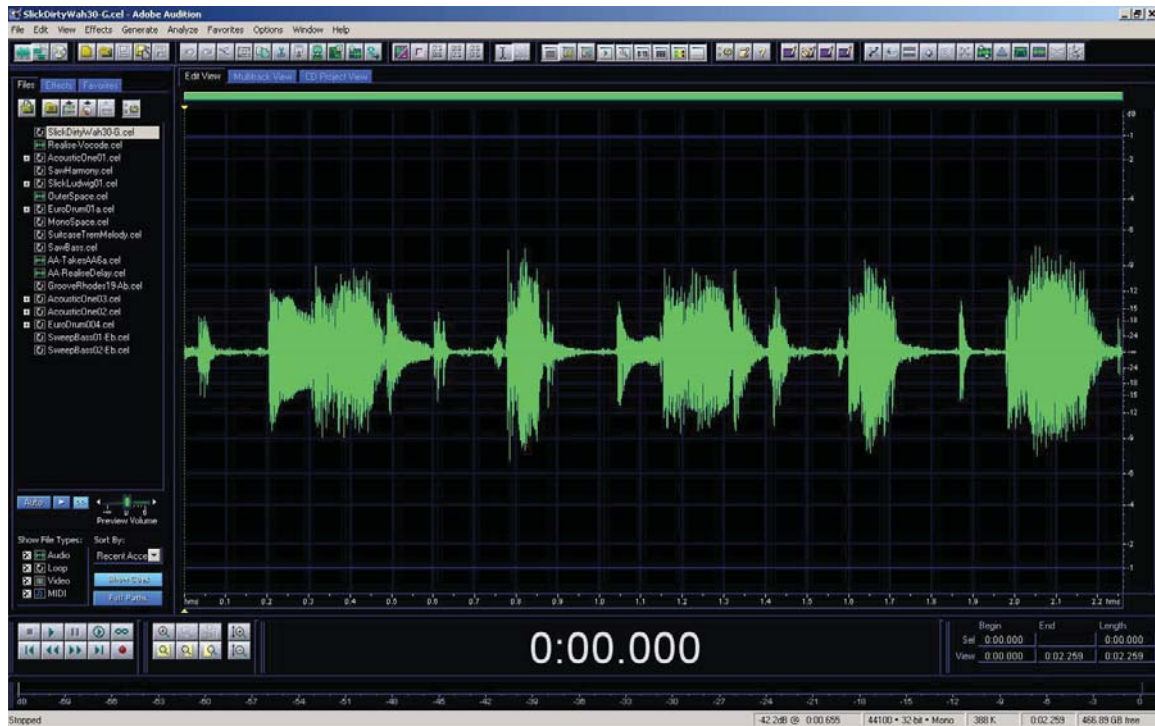
Figure 3: Screen shot of Adobe Audition single track Edit view.

One negative for a business is that Adobe Audition is only available for the Windows

platform, so businesses that use Mac, Linux, or other operating systems might consider another

recording program. However, since audio formats such as WAV and MP3 are platform

independent, the operating system on the computer used for audio recording purposes would not

necessarily have to match the operating system used throughout the company. Also for a

company that uses the Mac OS, Audition will run under Parallels with Windows, VMware

Fusion with Windows, or Boot Camp with Windows.

Appendix C

Pro Tools is developed and distributed by Digidesign a division of Avid Technology. Pro Tools is considered by many to be the professional standard for recording studios, film and video production, music recording, audio post-production and Internet media recording (Shepherd, 2008).

There are two different Pro Tools systems available: Pro Tools HD and Pro Tools LE. The Pro Tools LE system is subdivided into the 003 Family and the M-Powered Family. Each of these systems requires an external interface produced by Digidesign in order to operate. The software will not operate through a normal computer sound card, but will only work using this proprietary interface.

The Pro Tools HD product is designed for professional use in a recording studio environment. The lowest priced Pro Tools HD system is nearly $8,000. Because that price is higher than total cost goal for this project, the Pro Tools HD system will not be considered.

As mentioned above, the Pro Tools LE system is subdivided into the 003 Family and the M-Powered family. The lowest priced 003 system is nearly $1,300 which makes it too expensive to consider as part of this project.

For the purposes of this project, the Mbox 2 Pro Tools interface was chosen for consideration. The Mbox 2 is priced at $495 which is reasonable considering the primary goal of the project is to complete a podcasting studio for under $2,000. The cost of the Mbox 2 interface includes the Pro Tools LE software.

The M-Powered Pro Tools LE software can record 48 simultaneous tracks of audio from sources such as microphones, line inputs (used for musical instruments) and other audio sources.

The application allows the use of up to 128 separate tracks in a multitrack mix. Pro Tools LE operates on both Windows and Mac OS X platforms.

Pro Tools, like other audio recording software, allows the user to record, edit and mix various sound files. Individual tracks can be edited using Cut, Copy, Paste, and Delete functions common to other recording applications.

Figure 4 shows the interface for the M-Powered version of Pro Tools LE using the Mbox 2 audio interface. The figure shows eight separate tracks that can be mixed down to create a single audio file. This audio file can then be saved in the MP3 format as a podcast and uploaded to the Internet. However, in order to save files in the MP3 format, Digidesign requires users to purchase a license for the MP3 technology. The license is sold through the Digidesign website for $19.95.
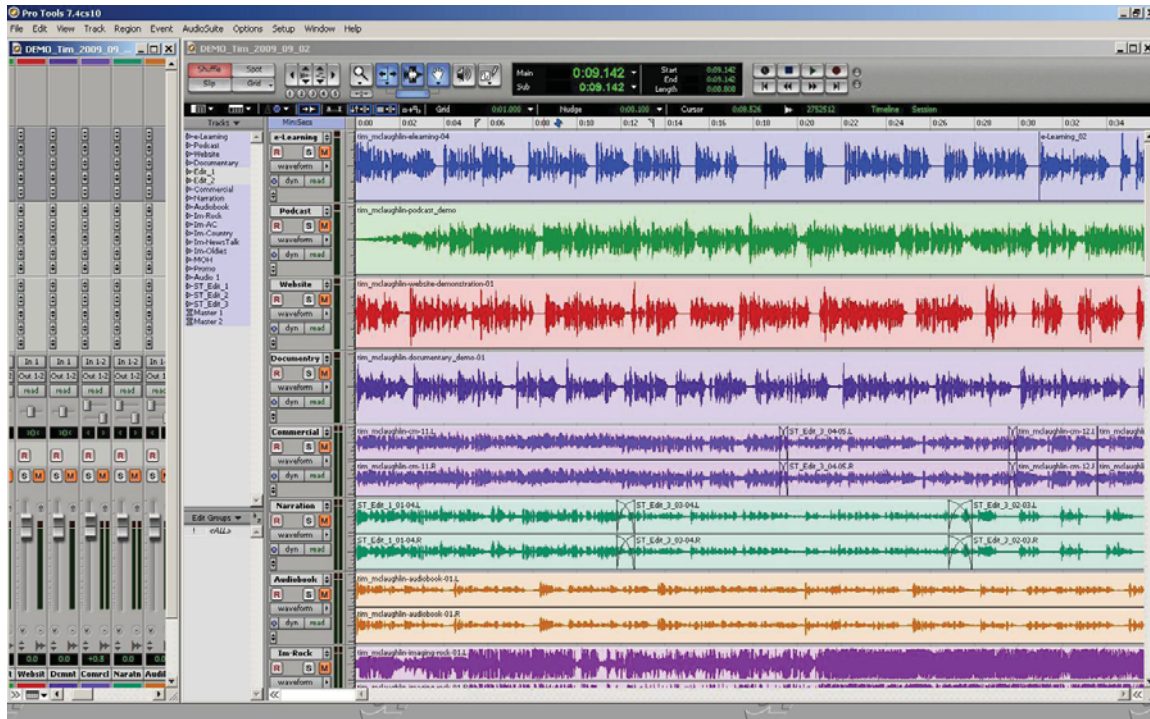
Figure 4: Screen shot of Pro Tools LE M-Powered interface.

One major drawback with Pro Tools is that unlike Audacity and Adobe Audition, when Pro Tools mixes multitrack sessions into a single audio file it is done in real time. This means, for example, that a 15-minute podcast will require an additional 15 minutes to create the finished sound file, a 30-minute podcast will require and an additional 30 minutes, and so on.

Appendix D

Connecting the Alesis MultiMix 8 USB mixer as the central part of podcast recording studio is not a complicated procedure. Figure 5 shows how microphones are connected to the mixer and how the mixer is connected to the computer and the studio monitors.
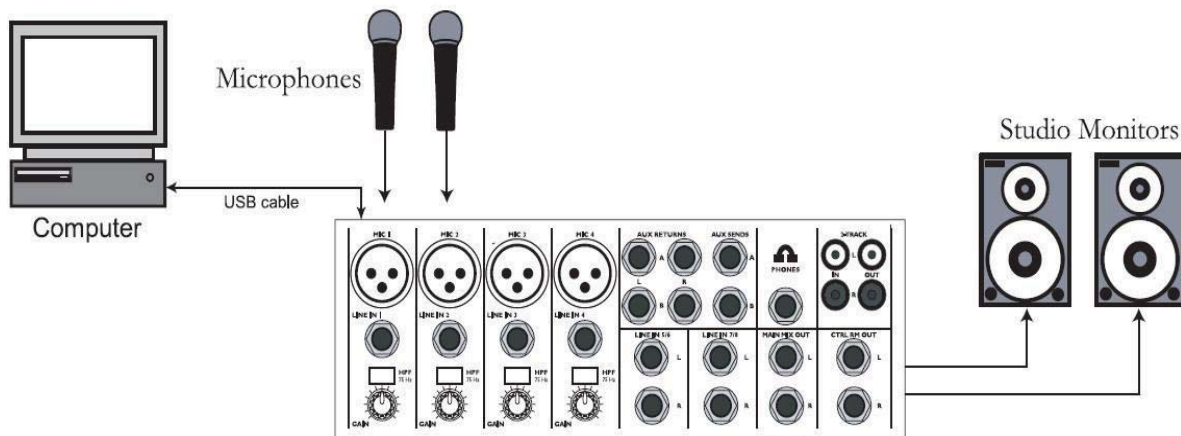
Figure 5: Configuration of Alesis MultiMix 8 USB Mixer

Appendix E

Specifications of the Alesis MultiMix 8 USB mixer. This is the recommended mixer in this project.

Input Channels

    Mic In Sensitivity Range: -60dBu to –10dBu nominal, +5dBu maximum

    Line In Sensitivity Range: -40dBu to -+10dBu nominal, +25dBu maximum

    Mic/Line Gain Range: +10 to +60dB

Equalization

    High-Pass Filter: 75Hz, 18dB/octave

    High Shelving: 12kHz, +/- 15dB

    Mid Bandpass/Band Reject: 2.5 kHz, +/- 15dB

    Low Shelving: 80Hz, +/- 15dB

Aux Sends

    Aux Send A & B Gain Range: -∞ to +10dB

Aux Returns

    Aux Return A Gain Range: -∞ to +15dB

    Effects Level/

    Aux Return B Gain Range: -∞ to +15dB

Channel Levels

    Channel Level Gain Range: -∞ to +10dB

Master Levels

    Main Mix, Ctrl Room Gain

Range: -∞ to +10dB

1/4" Inputs

Stereo Aux Return Level: +4dBu nominal, +20dBu maximum

RCA Inputs

Tape In Level: -10dBV nominal, +5dBV maximum

1/4" Outputs

Main Mix, Ctrl Room,

Ext Aux Send Level: +4dBu nominal, +20dBu maximum

Headphone Output: 75 ohm output impedance

>105mW into 75 ohms, >40mW into 600ohms

RCA Outputs

Tape Out Level: -10dBV nominal, +5dBV maximum

Appendix F

Table 7: Specifications of Creation Station Tower LE

Motherboard	ASUS w/P43 Chipset
CPU:	Pentium Dual Core 2.5GHz / 800MHz Front Side Bus
Heat sink/Fan:	Intel Reference Cooler
RAM:	2GB DDR2/800
System Drive:	Seagate 500GB SATA 7,200 RPM
Audio Drive:	Optional
Optical Drive:	DVD+/-RW with Lightscribe
Card Reader:	Multi Card Reader reads and writes: · MMC Card · Microdrive · CompactFlash · SD Card · SmartMedia Card · Memory Stick · MS/Pro
Video Card:	GeForce 8400GS 1 VGA / 1DVI-I
Ports:	8 x USB 2.0 (6 back, 2 front); 1 x LAN (RJ45)
PCI Slots:	1 x PCIe 2.0 x16 (occupied); 2 x PCIe-x1; 3 x PCI
Case:	Mid-Tower
Case Lining:	Auralex SheetBlok-Plus™ Sound Dampening System
Feet:	Vibration-resistant AcoustiFeet
Power Supply:	Antec 380 Watts
OS:	Vista Home Premium.
System Restore:	Acronis TrueImage OEM
Keyboard:	110-key Logitech keyboard with master volume control and programmable keys
Mouse:	3-button Optical Mouse w/Scrollwheel
Warranty:	Two years for the entire machine. Three years limited for

	hard drives. Lifetime for memory.

Appendix G

Adobe®
Audition® 3.0 Read Me

Welcome to Adobe® Audition®. This document contains late-breaking product information, updates, and troubleshooting tips that may not be covered in the Audition Documentation.
Minimum system requirements
Serial Numbers
Install your software
Activating your software
Install your Loopology content
Uninstall your software
Registration information
Known issues
Customer care
Other resources

Minimum system requirements

      Intel® Pentium® 4 (1.4GHz for DV, 3.4GHz for HDV); Intel Centrino®; Intel Xeon® (dual Xeon 2.8GHz processors for HD); or Intel Core™ Duo or compatible processor (SSE2-enabled processor required for AMD systems)

      Microsoft® Windows® XP Professional or Home Edition with Service Pack 2 or Windows Vista® Home Premium, Business, Ultimate, or Enterprise (certified support for 32-bit editions only)

      512MB of RAM (1GB for DV playback; 2GB for HDV and HD playback)

      10GB of available hard-disk space (when used with Loopology DVD)

      DVD drive required for installation

      1,280x900 monitor resolution with 32-bit video card and 16MB of VRAM

      Microsoft DirectX or ASIO compatible sound card

      QuickTime 7.0 required to use QuickTime features

      Internet or phone connection required for product activation

The latest information on system requirements can be found at
http://www.adobe.com/products/audition/systemreqs/

Serial Numbers

Adobe Audition 3.0 uses a 24-digit serial number. If you purchased the product on CD, the serial number can be found on your registration card or on the back of your CD ROM case. If you downloaded the software electronically from the Web, the serial number is on the receipt page that confirms your purchase (a copy of the receipt page is e-mailed to you). For software downloads purchased through Adobe, you can also view the product's serial number in your Order History section of the Adobe Web site. Note: Do not use the number on the bottom of the Adobe Audition box.

When installing a new version of Adobe Audition 3.0, you will be required to enter the serial number. If you are installing an upgrade and the installer cannot find the previous version on your hard drive, you will need to enter both the new 24-digit serial number that was included with the upgrade and the serial number from your previous version.

If your serial number does not work, please contact Adobe Customer Support: www.adobe.com/support/main.html

Install your software

Make sure that your computer meets the system requirements for Adobe Audition 3.0. The system requirements are listed on the Adobe Audition 3.0 box and in this ReadMe file.

Before you install, close all applications currently running on your system—including other Adobe applications, Microsoft Office applications, and browser windows.

The installer requires that you enter the serial number. The serial number is located on the application CD or, if you downloaded the software electronically from the Web, it is on the receipt page that confirms your purchase (a copy of the receipt page is e-mailed to you). For software downloads, you can also view the product's serial number in your Order History section of the Adobe web site if you purchased the software through Adobe.

To install Adobe Audition 3.0:

1. Do one of the following:

If you are installing Adobe Audition 3.0 from a CD, insert the application CD into your CD drive. If the installer starts automatically, follow the on-screen instructions to install the application. If the installer does not start automatically, double-click Audition 3.0 Setup.exe in the Adobe Audition CD folder, and then follow the on-screen instructions to install the application.

If you downloaded Adobe Audition 3.0 from the Web, the installer should start automatically when the download completes. If it doesn't, double-click Audition 3.0 Setup.exe in the Adobe Audition 3.0 folder you downloaded. Follow the on-screen instructions to install the application.

To start Adobe Audition 3.0:

Choose Start > All Programs > Adobe Audition 3.0.

Activating your software

You need to activate your copy of Adobe Audition 3.0 within 30 days of installing the software. You can activate your copy by using your Internet connection or by calling customer service.

Activation is a series of simple and quick steps users of Adobe Audition take upon installation in order to begin using the application. Product activation is built in to help Adobe prevent copying of the software onto more than the number of computers permitted by the license agreement governing the software. You can choose the activation process you prefer: by Internet, by phone using the 24-hour automated Adobe Software Activation System, or by phone speaking directly with a Customer Care Representative. If you've activated more than two times using your Internet connection, you'll need to activate by phone.

During the activation process, you'll provide Adobe with the randomly-generated activation number given to you. Because each activation code and serial number is unique, Adobe can compare the numbers from your activation request with our database to help ensure that your copy of the software has not been activated more times than allowed under its license agreement.

When you need to activate

Adobe's activation system offers you a choice on when and how to activate. Adobe offers a 30- day grace period during which you can use the software without activating. There are activation reminders during the grace period. After the 30-day grace period you will not be able to use the software until you activate. Some circumstances may require you to activate again. If you replace or reformat your computer's hard drive, you may need to activate again on that computer. You may also need to activate again if you uninstall Adobe Audition. There are two uninstall options. Advanced Uninstall removes all components of the software, requiring you to activate again when you reinstall. If you uninstall using the Standard option, you won't need to activate again (certain activation related files and information remain on your computer).

How activation information is used

The unique serial number assigned to each copy of Adobe Audition is combined with a randomly generated number, assigned to your computer. Adobe's activation system does not transmit, or collect, any personal information, including your hardware configuration. Activation is separate from product registration, which is optional. Registration is for those customers who want to receive information about product updates and other special offers from Adobe. Adobe stores registration and activation information on separate secure servers, and there is no linking of these sets of data.

Note: No personal information is collected by Adobe Systems when you activate your software. No information about your use of the product or the files you create with the product is provided to Adobe Systems. Data necessary for activation is sent to Adobe Systems only at the time of activation.

To activate Adobe Audition:

1. Start Adobe Audition. (If you've just installed the software, the Activation screen appears automatically.)

2. When the first Activation screen appears, do one of the following:

• If Adobe Audition detects an Internet connection, a message appears on the screen asking if you would like to activate over the Internet. Click Next to start the Internet activation process.

• If Adobe Audition does not detect an Internet connection, or if you want to activate by phone or at a later time, click Other Activation Options.

3. If you clicked Other Activation Options, do one of the following:

• Choose Over The Internet, and then click Next to start the activation process immediately. A status screen lets you know how it's progressing. If you're having trouble, try activating by telephone.

• Choose By Telephone Via The Automated Software Activation System to begin phone activation. Click Next to bring up a screen with the Adobe Customer Service phone

Choose Remind Me if you want to delay the activation process by a few days. Choose a reminder option from the pop-up menu, and then click Next. You still need to activate within 30 days if you choose this option.

Install your Loopology content
To install your Loopology content:

1. Make sure Adobe Audition 3.0 is already installed by following the installation instructions.

2. Do one of the following:
    If you are installing the Loopology content from the Loopology DVD, insert the DVD into the DVD drive. If the DVD contents pop up automatically, double click on the Loopology folder and then double click setup.exe and follow the on-screen instructions to install the Loopology content. If the DVD contents do not pop up automatically, browse your DVD with a file explorer, double click on the Loopology folder and then double click setup.exe and follow the on-screen instructions to install the Loopology content.
    If you downloaded the Loopology content from the Web, the installer should start automatically when the download completes. If it doesn't, double-click Setup.exe in the Adobe Audition Loopology Content folder you downloaded. Follow the on-screen instructions to install the application

Uninstall your software

1. Before you uninstall, close all applications currently running on your system—including other Adobe applications, Microsoft Office applications, and browser windows.

2. Open the Windows Control Panel and double-click Add or Remove Programs (for Windows XP), or Programs and Features (for Windows Vista). Select Adobe Audition 3.0, click Change/Remove, and then follow the on-screen instructions to remove your software.

Registration information
When you install your software, be sure to register to get up-to-date product information, training, newsletters, and invitations to Adobe events and seminars.
Known issues
In order to provide you with the most up to date information, please refer to the online Audition Release Notes for a list of all known issues.
Windows Vista: Deactivation option is not offered when uninstalling from Windows Vista
If you would like to uninstall Audition 3.0 and use it on a different machine, you can do so by using the Transfer Activation feature. This feature allows you to remove your product activation from one machine in order to activate on another. On Windows XP, this is offered as an option during the uninstall process; however on Windows Vista you must perform this transfer before uninstalling the application:

1. Open Audition 3.0.

2. Go to Help > Transfer Activation.

3. Follow the steps to complete the process.

4. Uninstall Audition 3.0.

Windows Vista: Installing Adobe Audition 3.0 from the MSI file results in an activation error on launch
If you run the Adobe Audition 3.0.msi file in Windows Vista, Audition will install, but when you try to launch, you will receive the following error:
"Current user account does not have the privileges to perform product activation. Run this application from a user account with administrative privileges or contact your system administrator."
To fix this issue, either:

1. Run the Audition 3.0 Setup.exe file to install instead of running the .msi file.

2. If you have already installed, repair the installation from the Uninstall command in the Windows Control Panel.

Windows Vista: AERO: "Enable Desktop Composition" causes dropouts during recording.
Due to increased video and CPU processing used by the Windows Vista "AERO" feature, recording while this is enabled may produce some dropouts, especially with computers that are close to the minimum system requirements, recording at higher sample rates and bit depths, and/or while recording in any of the spectral viewing modes (frequency, pan, or phase). To help remedy this, you can record using waveform view only. If you still get dropouts, you can also disable the AERO feature called "Desktop Composition" under Windows Vista performance options:

1. Open Control Panel.

2. Double-click "System."

3. Click "Advanced System Settings."

4. Under visual Effects, un-check the box next to "Enable Desktop composition."

5. Click Apply, and then click OK.

Enabling Live Preview of MIDI Sequencer:
In order to preview VSTi audio and MIDI Input while idle, users must perform two steps:

1. MIDI Tracks must be set to "Live Monitoring" mode by clicking the green "L" button located in the track controls panel in Multitrack. It is in the same location as the "Record Enable" button is located on Audio tracks.

2. Set Monitoring Mode, located in the Session Properties panel, to "Audition Mix." This enables the internal Audition mixing engine to process VSTi output without the need to be in a record or playback state.

Adobe Bridge CS3 cannot be installed from a network location
Adobe Bridge CS3 is included with Adobe Audition 3.0 and can be installed in the following ways:

1. Install from CD: You can click the Adobe Bridge icon from the Autoplay menu or browse to the Adobe Bridge CS3 folder on the CD.

2. If you downloaded your copy of Audition 3.0, you can run the Bridge installer from the Adobe Bridge CS3 folder.

The stand-alone installer for Adobe Bridge CS3 cannot be installed from a network location. You will receive an error message asking you to insert Adobe Bridge CS3 when a network install is attempted and the process will fail. If you have the Adobe Bridge CS3 folder stored in a network location, please copy the folder to a local hard drive in order to properly install the application.
Notes:
        If you already have Adobe Bridge CS3 installed there is no need to install it again. Audition 3.0 will be able to use the version that was previously installed.
        After installing Bridge CS3 we suggest that you launch Bridge and go to Help > Updates to download and install the latest version.

ASIO driver vs. Audition Windows Sound
For the highest level of compatibility, Adobe Audition 3.0 automatically assigns your default Windows sound card as its default inputs and outputs. If your audio hardware supports the ASIO driver model, we recommend that you choose it in the Audio Hardware setup dialog instead of the Audition Windows Sound, as this will give improved performance in most cases.
There is a known issue with the ASIO driver for the Creative Audigy line of sound cards where, when Audition closes, the ASIO driver does not release itself and Audition remains running in memory and visible as a running process in the Windows Task Manager. To prevent this issue with these cards, leave the hardware setup set to Audition Windows Sound.
CD burning
Some CD-RW drives cannot handle writing ISRC and UPC/EAN values. If your attempt to write fails, try to uncheck the Write CD-Text box in the Write CD dialog and uncheck the ISRC box in the Track Properties dialog for every track in the CD Project View.
For some CD-RW drives, an incorrect write speed is displayed in the CD Device Properties dialog and you will be unable to change the setting. In these cases, the CD will be burned at the maximum possible speed for the drive.
The maximum number of Index Cues per track supported by Adobe Audition is 98.
Extract Audio from CD
The default mode for CD audio extraction is SPTI. It is recommended that you do not use ASPI due to known problems with different versions of ASPI drivers. For more details, visit the Adobe Audition Support site.
Only silence will be extracted when the Buffer Size setting in the Extract Audio from CD dialog is greater than 128 KB when using SPTI mode for CD audio extraction. Use 128 KB or lower to work around this problem.
ReWire

To launch an application in ReWire slave mode, you first need to launch Adobe Audition, enable ReWire, and then select the ReWire slave application. Then click on the Launch button to start the Rewire slave application. Some ReWire slave applications do not support being launched via ReWire and nothing will happen when you click the Launch button. For these applications, start the slave application through normal means after enabling ReWire in Adobe Audition, such as the Windows Start > Programs menu. Once the ReWire application is then launched, it will automatically be in Slave mode.

Adobe Audition does not support multiple tempos within a single session. If your ReWire slave application uses a session that contains multiple tempos, Adobe Audition will not respond to the tempo changes. Changes made to tempo and time signature within a ReWire slave application will not be reflected in Adobe Audition. However, changes made to the session tempo or time signature in Adobe Audition will be reflected in the ReWire slave application.

Snap to frames behavior

In Multitrack View, it is possible to set your snapping behavior to frames by right-clicking on the timeline, and selecting Snap to Frames (Always). This allows the cursor to snap to a frame boundary, as long as the time format is measured in frames (such as Compact Disc and SMPTE). This command is especially handy for working on audio for CD. It is important to note that the frames in use here are audio frames, not video frames.

Saving when file is open in Adobe Premiere Pro

When attempting to save a change to an audio file in Adobe Audition that is also loaded in Adobe Premiere Pro, you may see an error that states: "File is probably in use by another application. Please close the other application and try saving again." In this case, the file is still being read by Adobe Premiere Pro in order to conform the audio. You will need to wait until the audio from the file is conformed in Adobe Premiere Pro before saving the changes to the file. A progress bar in the lower right corner of the Adobe Premiere Pro application window displays that status of the audio conform.

Customer care

Customer Service Adobe Customer Service provides assistance with product information, sales, registration, and other non-technical issues. To find out how to contact Adobe Customer Service, please visit Adobe.com for your region or country and click on Contact.

Support Plan Options and Technical Resources If you require technical assistance for your product, including information on free and paid support options and troubleshooting resources, more information is available at http://www.adobe.com/go/support/. Outside of North America, go to http://www.adobe.com/go/intlsupport/. Free troubleshooting resources include Adobe's support knowledgebase, Adobe user-to-user forums and more.

If you are having any issues with installing or uninstalling, please try rebooting your system prior to contacting Support.

Other resources

Visit the Adobe Audition page on the Adobe Systems Incorporated Web site: www.adobe.com/audition. You will find links to tutorials, user groups, third-party plug-in developers, Adobe Customer Support, and more.

Documentation Order printed documentation at www.adobe.com/go/buy_books.