Television Production

Managing the Technology

HAMK
UNIVERSITY OF APPLIED SCIENCES

Bachelor's thesis

Media Technology

Riihimäki 3.5.2012

Evgenia Molchina

Evgenia Molchina

HAMK
UNIVERSITY OF APPLIED SCIENCES

Riihimäki
Media Technology
Television Production

Author Evgenia Molchina **Year** 2012

Subject of Bachelor's thesis Television Production

ABSTRACT

The idea to write the thesis about television production came into my mind a long time ago. I knew that this area of media technology was the most interesting for me. I had an internship in Aito Media Oy television production company in 2009, and I studied TV Production at Ferris State University, USA for one academic year 2010-2011.

The main objective for my thesis is to research, compare and describe all steps in production of a television show from the developing an idea through planning, budgeting, shooting and editing to the final release of the TV show on the screen. Also I would like to observe the technologies used nowadays and determine the role of a producer in the TV production.

To reach my objective, I read several books and electronical materials on different topics about phases of the production, equipment and techniques, communication and documentation. Furthermore, I use knowledge from my own experience, which I got while studying and making practical tasks at Television and Digital Media Production program at Ferris State University.

I learned the professional skills required in all aspects of different phases of television production, including studio workflow, camera operation, field equipment, multicamera directing and the responsibilities and organizational expertise of the producer. At the same time, I explored the latest production techniques and technology, such as audio and lighting workstations, non-linear editing, high-definition television and 3D television.

Keywords TV production, producer, TV studio, television operations.

Pages 45 p. + appendices 12 p.

HAMK
HÄMEEN AMMATTIKORKEAKOULU

RIIHIMÄKI
Mediatekniikka
TV tuotanto suuntautumisvaihtoehto

Tekijä Evgenia Molchina **Vuosi** 2012

Työn nimi TV tuotanto

TIIVISTELMÄ

Ajatus tehdä opinnäytetyöni televisiotuotannosta tuli jo kauan sitten, koska tiesin, että se on henkilökohtaisesti mielenkiintoisin alue mediatekniikassa. Olin työharjoittelussa Aito Media Oy tv-tuotantoyhtiössä vuonna 2009, ja lukuvuodessa 2010-2011 opiskelin Ferris State University:n TV-tuotanto ja Digimedian koulutusohjelmassa, Yhdysvaltoissa.

Työn päätavoitteena on tutkia, vertailla ja kuvata kaikki tv-ohjelman tuotannon vaiheet alkaen idean kehittämisestä, sekä suunnittelun, budjetoinnin, kuvausten ja editoinnin kautta lopullisen tv-ohjelman version julkaistamiseen. Myöskin haluan havainnoida nykyaikaisia tekniikoita ja määrittää tuottajan roolin tv-tuotannossa.

Tavoiteeni saavuttakseni olen lukenut useita kirjoja ja elektronisia lähteitä erilaisilla aiheilla, kuten tv tuotannon vaiheet, laitteisto ja tekniikat, viestintä ja dokumentointi. Lisäksi käytän tietoja omasta kokemuksestani, mitkä sain kun opiskelin Ferris State University:ssa ja tein erilaisia tv tuotannon liittyviä tehtäviä.

Olen oppinut tarvittavaa ammattitaitoa kaikilla tv-tuotannon vaiheilla, kuten työnkulku studiossa, cameran operointi, tuotantolaitteiden käyttö kentällä, monicameroiden ohjaus sekä tuottajan vastuut ja järjestelytaidot. Samalla tutkin viimeisimpiä tuotantomenetelmiä ja tekniikkaa, kuten ääni- ja valaistustyöasemien käyttöä, käytössä olevia editointiohjelmistoja ja teräväpiirtotelevision ja 3D television ominaisuuksia.

Nyt olen valmis työskentelemään televisio- ja digitaalisen median tuotannon alan yrityksessä, missä voin näyttää mitä osaan, ylläpitää taitojani ajan tasalla ja kehittää niitä kun teknologiakin kehittyy tulevaisuudessa.

Avainsanat TV tuotanto, tuottaja, tv studio, televisiotoiminta.

Sivut 45 s. + liitteet 12 s.

GLOSSARY

A-roll The process of first laying down all the sets of shots and sound bites in editing system, and making sense of the projects narrative view-point.

B-roll Extra footage that is not the primary shot, and used for montages, background, or cutaways.

Camcorder (camera recorder) An electronic device that combines a video camera and a video recorder into one unit.

CCD (charge coupled device) An electronic chip in most video cameras that converts light and images to electrical impulses.

CG (character generator) Often is used to "write" text electronically on the video picture in opening and closing credits, show titles, and in the lower third of the picture to identify a speaker or what is happening on the screen.

Chroma A video term relating to true color, with no blacks or grays.

Chroma Key A technique for layering two images or video together by removing a background of the subject. See also **Green screen**.

Color bars The traditional test of a video signal, this series of vertical bars — white, yellow, cyan, green, magenta, red, blue, and black - appears at the beginning of a reel.

Component video A video signal that separates the chrominance (the color) from the luminance (the blacks and whites), resulting in sharper detail and color.

Composite video The luminance and chrominance are combined to form one analog signal.

Compression A digital video storage system that reduces, or compresses, the data in the footage which facilitates storage space.

Credits Complete list of all the cast and crew who worked on a project, from its beginning to end, and who are given "credit" for their work.

Dubs Both audio and video are duplicated and copied onto a variety of video formats.

EFP (electronic field production) Television production outside of the studio.

ENG (electronic news gathering) The use of portable camcorders, lights, and sound equipment for the news stories. Usually, not planned in advance and transmitted live or immediately after postproduction.

Equalizer An audio device that can increase, decrease, or modulate high, medium, or low frequencies when mixing dialogue, music, ambient sound, etc.

Final cut The last and final version that reflects all visual and sound edits and creative decision.

Green room An area set aside for actors and talent that is private, comfortable, and quiet.

Green screen (or blue screen) A screen or background material that is green (or blue) against which the action is shot. In editing, the subject is "lifted" off the background and combined with other visual effects. This process is called a chroma-key effect.

HDTV (high-definition television) Video signals with a high resolution (roughly twice the lines of standard TV) and a sharp visual clarity similar to film.

Lavaliere (lav) An easily concealed small microphone that clips onto clothing; it is generally omnidirectional and picks up dialogue clearly.
Luminance In a video image, the measurement of pure white in the picture.
Narration Voice-over or narration is provided by an off-camera person who records the script at a recording studio.
NLE (nonlinear editing) A digital system, that edits footage in a random, nonsequential way similar to film-style editing.
NTSC (National Television Standards Committee) NTSC is a national standard for American color television, consisting of 525 interlaced scan lines per frame, and runs at 30 fps.
Omnidirectional A microphone that can pick up audio from all directions.
PAL (phase alternating line) Video format used in the UK, Australia, China, and parts of Western Europe. This video format is 625 lines and runs at 25 fps.
Pitch Selling an idea for a television show to a network, client, independent producer, or other end user. Also, a written proposal acts as a selling tool for the idea.
Public domain When the copyright has elapsed on specific footage, it has no legal owner and can be used without obtaining legal clearances or paying royalty fees.
Ratings A measurement that determines what programs TV viewers are watching and at what times.
Release A legal agreement that gives a producer the right to use someones likeness, location, artistic material, or other object in ways that are detailed on the release.
SECAM (sequential color with memory) The video standard of 625 lines that runs at 25 fps, used in Russia, Eastern Europe, and France.
Setup All the elements needed for a specific shot, such as the placement of the camera, the lenses and microphones, and the composition of the frame.
Storyboard Simple, cartoon-like sketches of each scene in a script; also, a paper cut detailing the cuts and their time codes and reel locations for the editor in an edit session.
Talent Anyone who appears on camera, such as an actor, performer, host, guests, etc.
Teleprompter A small monitor that is mounted directly under the camera lens that displays the performers lines in a roll-down scroll.
Time code (TC) A signal “burned on” the videotape that gives every frame a specific number in hours, minutes, seconds, and frames per second.

TABLE OF CONTENTS

1 INTRODUCTION

> Television was the most revolutionary event of the century. Its importance was in a class with the discovery of gunpowder and the invention of the printing press, which changed the human condition for centuries afterward.
>
> — Russell Baker, *Writer*

Television as a communications medium has had a remarkable impact on millions of people around the world, and it has created a unique environment of “home entertainment".

TV is a perspective of our everyday lives that we can enjoy alone, or in a group, and its presence in can be a source of human contact. With its immediacy, for many people, television is a primary source of information.
We can judge a program, content or quality sitting on the couch in front of TV, but we never think how much effort was spent for the production. Television production needs to be carefully planned from the beginning up to the end. Translating an idea into a video product which will be interesting, engaging and worthy is considerably more complex process. Production faces strict timelines and budget limits. Different people are involved such as cast and crew working with a variety of sophisticated equipment.

Television production management is challenging business. Planning every detail in advance leads to smooth shootings, editing and release of the final product in time. It is producer’s responsibility to make sure everything is under control; he is responsible for all happens during the production. There are basically two ways of doing the television. Either programs are shot in a specially designed television studio using several cameras, which are fed into a control room and assembled in "real time," or they are shot using a single camera on a location and assembled later in an editing room with a computer.

Televisions broad reach makes it a powerful and attractive medium for advertisers. Many television networks and stations sell blocks of broadcast time to advertisers, or "sponsors", in order to fund their programming.
Television develops all the time, from the changing technology in the way a story is brought. Even so, it will always be a breathtaking, intrigue and joyful entertainment, which will take us to the new places.

The main objective of my thesis is to research, compare and describe all steps in production, which are preproduction, production and postproduction. My point of interest is also to observe the technical parts of production, or that kind of technologies are used in modern lighting methods, camera operations or audio sound pickup. I will review the role of a producer of a television show during different production stages, such as developing an idea, planning, budgeting, shooting, editing and releasing the final TV show on the screen.

2 TELEVISION TECHNOLOGY AND PRODUCTION TEAM

2.1 Analog and Digital Television

Television *content* (a catch-all phrase for programs, news, information, music) comes into a television set through broadcast signals. These signals hold data: an image, sounds, graphic art, electronic lettering. (Kellison, 2005, 20) That data is re-created in TV set as clear images in video and audio. There are four broadcast signals in the carrier. Each signal separately controls the:

- Brightness of the image
- Colour of the image
- Audio from the image
- Synchronization of the transmitter and the receiver or TV set

Analog (or analogue) television uses a transmission method of conveying data, image, sound, signal or video information using a continuous signal, which varies in amplitude, phase, or frequency. The analog system processes and records a continuous signal that fluctuates exactly like the original one. An analog color video signal combines into one channel luminance, brightness (Y) and chrominance (C) of an analog television image.

Digital computers and digital video are based on a binary code that uses on/off values of 0's and 1's to interpret the world. The binary digit, or bit, acts like a light switch: it is either on or off. If it is on, it is assigned a1; if it is off, it is assigned a 0 (Zettl, 2009, 58). Digital process divides the analog signal into fixed intervals; the samples are then quantified or assigned a concrete value of 0's and 1's.

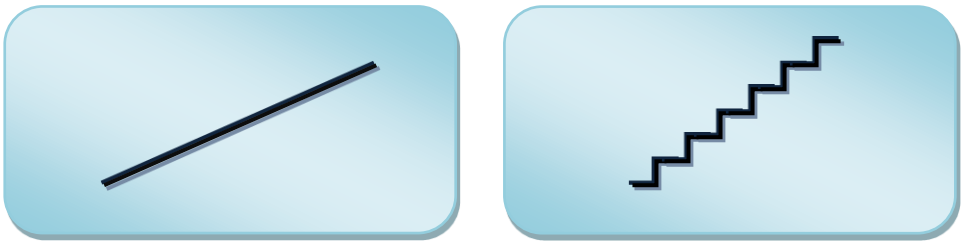

Figure 1 Analog signal (left) and Digital signal (right)

Digitizing an analog video signal is a four step process:

1. *Anti-aliasing* filters out extreme frequencies that are unnecessary for its proper sampling.
2. *Sampling* helps to select number of points of analog signal for changing them into discrete digital values. A high sampling rate with many smaller steps is preferred over a low one with larger and fewer steps.
3. *Quantizing* actually means the separation of continuously variable signal into defined steps and fitting them into the desired sample range. Or in other words, steps are built so that we can reach the top of the staircase and assigned by numbers.
4. *Coding*, also encoding, changes the quantization numbers to binary numbers 0's and 1's, and groups the bits variously.

One of the most visible differences between analog and digital television is the horizontally stretched television picture of HDTV. The aspect ratio, or the width-to-height proportions of the screen, for an analog television is 4 × 3, what means that 4 units wide by 3 units height. This aspect ratio is also represented as 1.33:1 where for every unit in screen height there are 1.33 units of width. The aspect ratio of high definition television is 16 units wide by 9 units height, or 16 × 9, which is multiple of 4 × 3 ratio (42 × 32). Also 1.78:1 ratio expresses its horizontally extended screen.

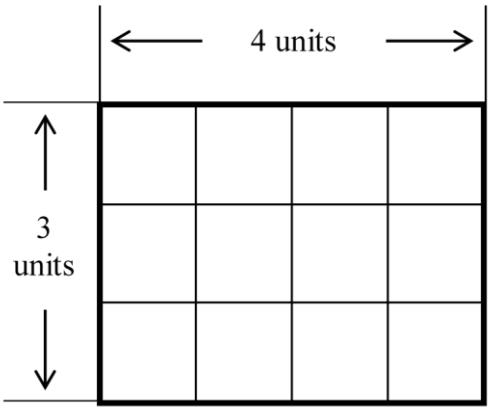

Figure 2 Aspect ratio 4 × 3

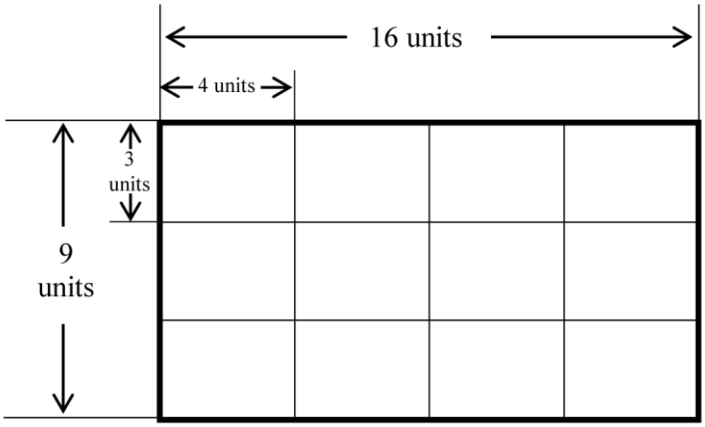

Figure 3 Aspect ratio 16 × 9

2.1.1 Benefits of Digital Television

World becomes more and more digital. Nowadays, our TV sets can do what our moms and dads ones could not. And everything thanks to digital television. Digital television has a lot of advantages such as high quality, computer compatibility and flexibility, signal transport, and compression.

Digital television uses the binary system, which has been great resistant to data distortion and error. Digital transmission is superior because it converts images and sounds into digital computer data and transmits them. It actually is more advantageous than the older analog method as it provides

a viewer with a better picture and sound quality. High definition became available.

Digital television signal can be transferred directly from the cameras to the computer. That signal can be easy adjusted with different software in postproduction. Computer-generated Images, animated segments, Chroma key would be impossible with analog equipment. Due to flexibility of digital signal, it can be distributed through a variety of wires such as coaxial or fiber-optical, and wireless media (Wi-Fi). Signal transportation introduces downloading, where entire video and/or sound data packages have to be transmitted, and streaming. In other words digital source comes as a continuous data flow.

One of the other benefits of digital TV is that the transmission can be compressed in order to take up less bandwidth. Digital compression standards for television are JPEG for still pictures and MPEG-2 for high-quality video. This implies that more channels can be transmitted over the same cable or over the air frequency. The digital television has another advantage of having a user friendly interface where the user can view the listings well in advance rather than having to flip through random channels to find out what is on and what is not.

There are some disadvantages also. In digital TV, it will either be viewed or nothing can be seen on the screen at all. In comparison the analog transmission method still provided the picture even if the quality degraded at times. Another inconvenience is that the old television sets do not have the facility to tune to new digital waves. Consumer has to buy a new-generation television or else buy the digital tuner who can be attached to normal television to provide the same effect. These are additional costs. And new equipment is more sensitive.

With the digital television became an opportunity to use HDTV High-Definition Television, which has roughly five times better resolution of traditional Standard-Definition Television system, or 1280 for 720p, or 1920 for 1080p. HDTV allows interactive interface, clearer pictures, superior sound quality, progressive scanning and a wider viewing screen.

2.1.2 3D Television

Interactive television contains a digital signal that can transmit graphics, games, forms of information, and whatever available data a broadcaster wants to add to the signal. It achieves a real convergence with computers and the Internet because digital TV can implant interactivity within the signal. To understand the 3D television picture, let us have a look on the technic of it representing. Each eye sees slightly a distinctive image, and the brain combines those pictures to form a single picture. The different points of view allow the brain to judge depth and distance. So in stereoscopic 3D technology those characteristics of human perception are used to create a 3D image.
During video making, special 3D cameras capture two images, simulating the different perspectives of the left and right eye. And special projection

hardware and eyewear are used to provide the illusion of depth when viewing the program. There are numerous techniques to produce and display 3D moving pictures. The elementary requirement is to display offset images that are filtered separately to the right and left eye. Two strategies are used to accomplish this: have the viewer wear eyeglasses to filter the separate images to each eye, or has the light source split the images directionally into the viewers eyes. The second option does not require the glasses.

Projecting stereoscopic images with filters, lenses or glasses includes different 3D display technologies:

- Anaglyphic 3D with passive red-cyan filters
- Polarization with passive polarized filters
- Alternate-frame sequencing with active shutter filters
- Head-mounted display with a separate display positioned in front of each eye, and lenses used primarily to relax eye focus

Leading electronic consumer companies engineers work on the developing of the 3D projection methods without lenses, such as autostereoscopic displays. This form of television promises a heightened sense of presence without eye strain. Integral photography (IP) is a system able to reproduce three-dimensional images by using an array of small lenses for capture and display. Integral photography does not require the viewer to wear special glasses, and it can display natural 3D images that change with the viewing position. The drawback of integral photography is that it requires a huge amount of data to produce good-quality images. (NHK, 2011) Anaglyph is what was used in the past, and may still use on select novelty products, including games. The polarization is how we see 3D television and movies nowadays. And IP technique is the future, allowing 3D images to be projected without the need for glasses.

2.1.3 Mobile Multimedia

The small screens of mobile multimedia, such as cell phones, iPhones and iPods, vary from the traditional 4 × 3 formats to square and even vertical. The digital scanning standards most frequently used are 480p, or visible lines progressively scanned, 720p, and 1080p. Mobile TV started to gain traction because it is portable. According to the Harvard Business Review (2010), the growing adoption of smartphones allowed users to watch as much mobile video in three days of the 2010 Vancouver Olympics as they watched throughout the entire 2008 Beijing Olympics – an increase of 564%.

2.2 Roles of Production Team

It is important that each person in the crew understands and performs his/her or her job responsibilities with maximum competence. Multi-camera television production is team work, and the team must coordinate and communicate to operate effectively. It helps to save money, time and nerves when the crew knows what they should do, where and when. The key positions are listed below.

In television production, the major task is working not much with equipment as with people. That is why all staff is divided on two large groups. First are ***nontechnical production personnel***, who are generally involved in translating a script into effective television images, they are producers, directors, floor managers, persons, which do not touch the technical equipment. They also called above-the-line personnel, because they belong to a different budget category from the technical crew. The second group is called ***technical production personnel*** for its participation in operating the equipment with skills and confidence. They belong to the below-the-line budget group, and they are true engineers, including camera operators, audio and lightning people, C.G. (character generator) operators, and people who set up communication and signal transmission equipment.

2.2.1 Producer

> I'm a producer. I do whatever is necessary to turn an idea into a finished product. That means at different times I've been a salesman, director, film editor, casting director, creative consultant — I've even driven the bus.
>
> — David L. Wolper, *Producer: A Memoir*

A producer's role is as much about people as it is about the details of production. In the entertainment industry, a television producer is generally responsible for the financial, legal, administrative, technological and artistic aspects of a production. TV producer stays in the project from beginning to end, including the complete post-production process. Producer is responsible for the whole project. He coordinates with client, advertising agencies, talent and writers agents. He creates a schedule and keeps an eye on the deadline. Producer hires the director, and director hires the crew. Producer deals with writers and script, talents and anchormen, hosts and guests. Producer manages budget and finds financial support; he keeps track of costs and deals with paying the vendors; monitors the daily cash flow. He makes on arrangements for travel, housing, and meals; he accepts for shooting permits and overseas releases and clearances.

There are still a lot of to-dos for a producer in post-production. He tracks all the footage that has been shot as well as all the reels, logs, locations, dubs, and logs sheets. Producer makes sure that footage, animations, graphics, and audio elements are stocked. He supervises all phases of post-production, including editing, mixing, and delivery of the final product to the end user, client, or broadcaster. This position sounds very busy, and it is indeed. That is why there are a lot of executive producer assistants, such as associate, line, field, etc. The strength of collaboration between the producer and the creative teams, the crew, the client, the talent, the vendors, and other people along the way achieve the success.

Kellison (2005, 5-6) defines what makes a good producer as:

- **A problem solver.** He is smart and plays fair. He is a nurturer, an arbitrator, a leader, and a team player. He is a risk taker and he has prepared contingencies for any predictable scenario.
- **The master of multitasking.** Whether the project is a low-budget documentary or an expensive weekly episodic drama, the producer must juggle dozens of tasks at once.
- **A middle man.** The producer who is wise enough to be on set regularly becomes the point person for the director, the actors, and the crewmembers who rely on his leadership. The producer balances the needs of the production with the needs of the talent.
- **Wants to know everything.** A good story and useful information are both at the core of a producers craft.
- **Enjoy the process.** Producer is comfortable doing business and being creative.

A strong producer does not need to know how to do everything himself - write, direct, edit, create sound, and light and design sets - but he knows and hires the best people to do those jobs and builds a team that can work together for a common aim.

2.2.2 Director

The director is a strong creative force in the production. Director is the person who keeps in mind all processes happened in the studio during production. Crew is listening what to do from the director through headsets. Director should find right positions and perspectives for cameras which help to explore details on the stage better. Director manages timing, when to switch cameras, put graphics, name keys, audio or B-roll on air.
Director has the whole picture of the production in his mind. At the same time he controls, directs and coordinates all crew positions. His commands come one step before something happens and he gives comments during the production. He listens to producer, but he is in charge for technical aspects of production and he makes decisions about the way how to bring to life producers idea. His eyes are the eyes of an audience. Director foresees what people in front of TV would like to see next.

Huge imagination, seeing and understanding of any small detail and fast reaction are in the head of the director. For example, noticing where a talent looks and changing a shoot there, maybe there is something interesting for the viewer.

2.2.3 Writer

Writers in TV do not all the time have the clout to be guaranteed that their script will be produced and aired as it was originally written. Usually writers - even the best of them - are often fired, hired, and replaced. But when writers develop producing skills or actually take on the producer's role, they can dramatically raise their chances of control over their project. Writer understands the project objective and works close with a producer.

2.2.4 Technical Director (TD)

The TD operates vision control and switching equipment. He monitors the technical aspects of all video sources on the switcher board — gain levels, chroma phase, synch timing, etc. It is the TDs job to guarantee all vision sources are maintained at "broadcast quality". He is the right hand of director and might also represent technical engineering management and control. This person usually possesses high level of skill within a television production field and may be recognized as an expert in that industry.

2.2.5 Camera Operator

Camera operator is a professional operator of a video camera. The cameraman is responsible for physically operating the camera and maintaining composition, focus and camera angles throughout a given scene or shot. Director communicates through headsets to camera operator in the studio, but on the field operator decides on what part of the event to cover.

2.2.6 Audio Engineer

Clear dialogues, sound effects, background audio, original or stock music, reducing noise - all those belong to audio engineers craft. This crew member is in charge of all audio operations. He is a specialist that deals with the equipment for the recording, mixing and reproduction of any sounds. Producer, engineer and mixer Phil Ek has described audio engineering as the "technical aspect of recording - the placing of microphones, the turning of pre-amp knobs, the setting of levels." (Hit Quarters, 2009)

2.2.7 Character generator (C.G.) operator

CG operator types or recalls the names and other graphic material from the computer to be integrated with the video. The same person can also do video-record operators job: run the videotape based recorder or digital recording devices, in other words push the record button on and off.

2.2.8 Lightning Manager

Lightning manager is in charge of lightning on the stage or set. He follows the rules of lightning of the talents on the screen, that details are highlighted, and he even creates the mood on the stage thanks to proper lightning technics. Usually lightning manager is found mostly in large productions. If the project is on the budget, then camera operator or stage manager takes responsibilities of lightning person.

2.2.9 Stage Manager

This crew member takes care of all activities on the studio floor. He coordinates talents or anchor, relays directors cues to talent, and supervises floor personnel. Usually stage manager is responsible for setting up the scenery and dressing the set. He meets guests and makes them feel more comfortable in the studio before the shootings, nicely talking to them and telling that is going to happen next, for example.

2.2.10 Video Editor

Video editor operates postproduction editing equipment. He edits segments of video production footage, sound recordings and special effects in the post-production process. Each editor has his own strengths and styles of cutting. An experienced editor can take contrasting shots and elements and knit them together in a seamless flow.

As a creative artist, he can “paint” a mood of the video with pacing clips together. Technically, the editor can design special effects or transitions between scenes, color-correct the footage, and make sure the project fits into the broadcast standards. In postproduction the editor can fix problems that inevitably pop-up in everyones project covering up mistakes or finding solutions to them. An editor can be a magician, a consultant, and an effective arbiter of what works and what does not (Kellison, 2005).

3 PREPRODUCTION

Regardless of whether you are the part of nontechnical or technical personnel, or whether you work with a big production team or all by yourself, you will certainly face three production stages: preproduction, production, and postproduction. Preproduction includes all the preparations and activities before the crew actually move to the studio or the field. It usually happens in two phases. First consists of transforming the basic idea into a workable concept or script. The second phase is designated for working out production details, such as locations, crews, necessary equipment, budget, etc.

3.1 Generating Idea

The story is a king. Regardless of what genre of television project is in development, a good story is its foundation. Whether it is a dramatic series or news show, a sitcom or a sports special, each genre spins around telling a story that is compelling and engages the viewer. Producers in television stay in touch with what is currently airing on TV, and at the same time think what might be aired in the future. They watch television, read the regular publications and industry trade magazines that deal with the TV businesses. As producer puts the pieces together, the intricacies of the television and entertainment industry become clearer and more manageable.

Our own creative well can give us lot of great ideas. Our mind is mega machine. We have imagination, which can bring us in places and situations we could never think about. Different ideas come from our head every day and we should catch them. Sometimes one great idea comes after another, and at other times you cannot think of anything exciting regardless of how hard you try. In this case there are some ideas generating techniques.

Brainstorming can be an effective way to generate lot of ideas and determine the best solution. Brainstorming is the most effective with groups of 8-12 people and a time limit. It should be performed in environment where participants feel free to relax and joke around; they would stretch their minds further and as a result produce more creative ideas. The key to successful brainstorming is not to pass the judgment on any comments, wild ideas, and try break through the conceptual blocks and bring an end to the idea.

Another more personalized and structured idea generator is clustering. A person starts with a central idea and branch out to whatever associations come to mind. (Zettl 2009, 26-27) To begin the person writes down a single word, and then spin off idea clusters that somehow relate to the initial word. Clustering shows pattern of thinking, so it serves well as a structuring technique.

Sometimes the idea becomes from unexpected place. Here are listed some of the good sources for the story ideas:

- **Friends, family, or people around**
  People around us are full of the different stories and experiences. They could not mean but still show interesting ideas telling that happened to them or their friends. Communication is very powerful tool. If producer heard something interesting, he should develop it in more interesting way and use.
- **History**
  Past conceals a lot of interesting and forgotten things. Everything goes around, and people like to see that hundreds of years ago there were the same human problems, love intrigues and friendship.
- **Book expos**
  Unknown writers have nice ideas in their books too. Looking through the books and writers promoted by publisher producer can find a lot of people ready to collaborate. It is easier to deal with young fresh writers than with already well-known ones.

Producing means seeing that a worthwhile idea gets to be a worthwhile television presentation (Zettl 2009, 26). The evaluation of idea is probably the most important step in the preproduction process. Producer should ask himself: Is the idea worth doing? and Is the idea doable? If the honest answer is "yes", then there are green lights for the project. The next steps are creating a program proposal, preparing a budget, and writing the script.

3.2 Program Proposal

A program proposal is a written document that includes the program title, objectives, target audience, show format (single TV show, series or digital movie), a brief description, production method, and approximate budget.
A program proposal should begin with a narrative overview of the proposed program, including a rationale for the program both in terms of the relationship between the proposed program and existing programs.

Estimated length of the proposal is 10 pages plus appendices. The body should carry the main message and data backing up your claims, while the appendices contain supporting information and detailed calculations, which may be important to some readers who require additional details. Proposals are directed toward a potential sponsor, network or client, who might be interested in the project. A project proposal makes an offer and tries to persuade a supervisor or a future customer to accept or buy it.

3.3 Budget

TV is all about business. It is an industry driven by revenue and profit margins, and the idea could translate into a business opportunity from which broadcasters and clients profit. When working for a client, producer need to prepare a budget for all preproduction, production, and postproduction costs regardless of whether the cost is, at least partially, absorbed by the salaries of regularly employed personnel or the normal operating

budget. Producer need to figure the costs not only for obvious items – script, talent, production personnel, studio and equipment rental, and post-production editing – but also for items that may not be so apparent, such as videotape or memory cards or other recording media, props, food, lodging, entertainment, transportation of talent and crew, parking, insurance, and clearances or user fees for location shooting. (Zettl 2009, 29)

3.3.1 Costs

Preproduction costs usually include the producers fee for taking meetings, hiring crews, casting actors or talent, coordinating acts, planning the shooting schedule, booking hotel, meals, and travel, researches, and generally planning development of the project. The script is a vital component of the project, and the producer works closely with the writer(s) in the preproduction stage. Budgeting for a writer can be done in several ways. For example, the producer and writer might agree on a flat fee that covers all aspects of developing the idea, writing the script, and any revisions. A writer might also be paid in stages, such as 30% of the agreed-upon fee after signing a contract, 30% with the first draft, and the remaining 40% is paid after final acceptance. (Kellison 2005, 59)

Careful preproduction planning is vital and saves money for the total budget of the project. The *production costs* budgeting can be the quickest and least problematic, because the producer has thoroughly explored and mapped out everything needed to shoot the project, the script has been completed, crew hired, contingency money has been put aside, and the many other details have been finalized so that the actual shoot can begin.

Post-production costs consider hours of footage that need to be screened, logged, and loaded into the editing system. The skills and style of the editor, and the costs for the editor, editing facility, the audio mixer and the audio facility; any graphics, artwork, animations, text, captioning, credits, and other design effects; music, narration, voice-over, sound effects, sound design, and even foreign language translation (Kellison 2005, 60).

A production budget is divided into two main columns: the estimated costs what the producers thinks a budget item will cost and the actual costs what the item really ends up costing. A third column of the plus or minus amounts may represent the difference between the estimated and the actuals costs. It provides an instant readout on the running costs, and let keep the budget on track. It is important to be realistic preparing the budget, and better to add to expenses a 15 or 20 percent contingency. Underestimating the costs may lead to regret. It is psychologically and financially as well easier to agree to cut the budget rather than ask for more money.

3.3.2 Funds and Financing

The producer is responsible to arrange finance for the production. Today all TV-programs are funded, somehow. Once a raft budget is created for

the project, producer can focus on raising the funds. Here are potential financing sources:

- *Private investors*: This category covers a widespread range of possibility, as well as refuse. Producer can approach people he knows – like friends, family, coworkers – or he can meet with business people he has never met who see the economic promise in the idea, are looking for tax advantages, or simply an ego boost. However, producer does not want to promise anything that cannot be delivered. Still, producer assures investors that he will do his best to pay back their good faith in him and his project. Some investors are happy about simply be on set and watch the shoot.
- *Grants*: Grants are a source of money that may cover a part or the entire budget of the project after meeting a specific set of qualifications. Grants are awarded by public and private foundations. For example Grants.gov is a central storehouse for information on over 1,000 grant programs and provides access to approximately $500 billion in annual awards.
- *Foundations*: Most big corporations assign specific funds to support projects in the public interest, and often to elevate their own public image. State and local government also offer funds for projects that fit their grants requirements.
- *Bank loans*: It is better to avoid investing own money. However, if a producer is determined to make his project, and he knows that he can pay the loan back later, it might be possible to get a bank loan if his credit allows.

An effective producer look for areas of flexibility in the budget, pulls in favors when necessary, knows how to negotiate, and cuts costs wherever possible while still maintaining quality. (Kellison 2005, 68)

3.4 Script

A television script translates an idea into a detailed text that can act as an outline for production. Besides telling the talent what to say, a script indicates how a scene should be played and where and when it takes place; it also contains important reproduction, production, and postproduction information (Zettl 2009, 32). A solid script provides the reader with a clear format and brief descriptions of the action. Good dialogue gives important plot information, reveals characters motivations, and pushes flow of the story line.

In commercial television, the script must include commercial breaks. These breaks include regular commercials, promos, and other material supplied by the local station affiliate. A one-hour show actually only broadcasts about 44 to 48 minutes of programming, along with 12 to 16 minutes of breaks. The script is generally about 50 to 55 pages long.
A half-hour show runs 22 to 24 minutes with 6 to 8 minutes of commercial breaks. The traditional guideline is that one page equals one minute of action; this can vary with the genre. (Kellison 2005, 43)

AUDIO	VIDEO
	Two men sit in the back of a cruising limo. Passing cars light their faces. MAN #1 is older, MAN #2 is clearly afraid of him.
Man #2: Dad, you gotta pay her back!	
Man #1: ... you eat yet? You look kinda pale ... Hey you. Boy. Pull over at the next burger joint.	Man #1 taps on the limo window

Figure 4 TV-friendly audio-visual script format (retrieved Kellison 2005, 46)

Scripts for television can be organized in several ways, depending on the show and its genre. It can follow the traditional screenplay format used in writing films, or it can be formatted with vertical columns for audio, video, and graphics guidelines. On the figure 4 is a short script of the drama scene that uses the traditional TV – friendly script format. Also in the script format can be added other information, such as graphics, lower thirds name, location, and title; transitions as a dissolve or wipe; and duration of a sound bite or visual action.

A rule "Don't say it if you can show it instead" works in the television production because the actors are paid for each said line. The avoiding unnecessary text helps save money. Storyboards are not necessary in each project, but for those who use them, they are useful tools for saving time and money. Storyboards are simple, cartoon-like sketches of each scene in a script. They are numbered boxes with a drawing inside; each box refers to a scene or shot number from the script. When the image or camera angle changes, so does the content of the box. Each sketch is a rough portrait of the scene being shot: the location of one character in relation to another, the surroundings, the colors or lighting in a scene. (Kellison 2005, 58)

3.5 Planning

Once producer made a decision about the most effective production approach, he begins coordination phase by founding clear communication channels among all the people involved, and he takes care of the facilities request, scheduling, publicity and promotion, permits and clearances.

3.5.1 People and Communication

Post-script planning stage involves hiring additional personnel for the production. The producer is the chief coordinator among the production crew. Producer must be able to contact every team member reliably and quickly. His most important task is to establish a database with such essential information as names, positions, e-mail addresses, home addresses, business addresses, and various phone, beeper, and fax numbers (Zettl 2009, 35). A good producer triple-checks the communication list and its credibility, he does not rely on a secondhand information. The communication is not complete until the producer hears back from the person he tried to reach.

Other crew members should also have access to the needed contact information to each other.

3.5.2 Facilities Request

The facilities request lists all pieces of production equipment, properties and costumes needed for a production. The facilities request usually contains information about concerning date and time of rehearsals, recording sessions, and on-the-air transmission; names of producer and director; all technical elements, such as cameras, microphones, lights, sets, costumes, makeup, graphics, video recorders, video and audio recording facilities, and other specific production equipment requirements.

It lists the needed studio and control room or the remote locations. Location shooting can add a specific look and mood to the production. It is generally less expensive than on a soundstage, especially if the location comes with furnishings, props, colors, or production space. A moving location can include a character on a busy street, shooting a day-in-the-life sequence, or an extra montage and background footage B-roll. A location scout is a valuable component in location shooting. (Kellison 2005, 117)

Shooting in a foreign location can lend additional depth or mood, or might be part of the scripts direction. Foreign locations can be less expensive by offering professional support crews with lower pay scales, tax incentives, or a strong currency exchange rate. Locations like Canada, South America, Eastern Europe, Australia, Iceland, and New Zealand can help the producer stretch the budget as well as provide viable locations. In some countries, the weather patterns can also extend a shooting season. (Kellison 2005, 118)

Locations can be costly. Sometimes a location cannot be negotiated, is unavailable, is too expensive, or simply does not exist. An excellent alternative is that virtual locations can be designed and created on a computer by computer 3-Dimensional graphics that can give a range of creative images, such as a futuristic building, a landscape, or a battleground with thousands of warriors. Building these virtual locations relies on a blue screen or a green screen background that is placed behind the shooting action and which later is replaced by the chroma key.

3.5.3 Production Schedule

The production schedule tells everybody involved in production who is doing what, when, and where over. One of the most important responsibilities of the producer is to monitor the progress of each activity and know where everyone stands relative to the stipulated deadlines. A call sheet lists what will be shot and who needs to be on the shoot, as well as call times for cast and crew, the locations, equipment, and scene numbers. The call sheet is distributed to the producer(s), director, production coordinator, studio or network executives, and other people that the producer puts on the distribution list.

Kellison (2005, 58) gives a very good example that shooting schedule is a key component in creating a budget. If, for example, show costs $5,000 a day to shoot and the producer has a 10-day shooting schedule, so he will need to budget $50,000. But if his shooting schedule goes off course and extends to 15 days, then he has got a $25,000 difference to consider. It is not unusual for the cast and crew of a one-hour TV show to work 16 hours a day; some shows shoot as many as 12 to 18 script pages each day. This translates to shooting a feature-length script in two weeks — an incredibly tough schedule.

3.5.4 Permits, Clearances and Rights

If a producer did not create the project idea himself, it is owned by someone else. If he wants to use it, he has to get permission before use. This applies to almost every aspect of the project: the talent, the script, the music, clips, images, photographs, products with brand names, props, and more. It is producers job to protect legally every single component with some form of permission. The legal aspect of producing is as important as the creative, technical, or budgetary needs of any project. This involves a common sense of understanding of entertainment law, and an awareness of the contracts, agreements, and rules that are integral in each stage of producing the project. A deal may start with a hearty handshake, and a verbal promise, but ultimately producer wants to make sure it is backed up with a solid legal documentation. There are three areas of intellectual property such as copyright, trademark and patent.

Copyright protects rights of author or creator and his original work, including the privilege to copy, distribute, adapt and sell the content. To protect an own expression (video, graphics, music, etc.) and get the ©-symbol creator has to register his work with the Copyright Office in the country. In Finland, there is a Copyright Council in the Ministry of Education and Culture, which is appointed by the government to assist the copyright matters and to give its opinion on the application of the Copyright Act. When work has been copyrighted — a screenplay, a drawing, an original idea — it must be either bought outright or licensed for its use in a project (Kellison 2005, 77).

Trademark is distinctive sign or indicator used by an individual, business organization which includes any word, symbol, name, or device. For example, brands, consumer goods, even buildings and well-known landmarks can be trademarked. If the producer wants to feature a trademarked item, he needs to ask permission from the trademark holder.

Patent is a set of exclusive rights granted by a state or national government and gives the right to the inventor to prevent other people from making, using, or selling the invention. Patent has a limited period of time in exchange for a public disclosure of an invention, and it is seldom an issue in TV production. There is an option to use the material from a free use area known as the *public domain*. There is a great amount of available artistic expression such as music, photography, and other material that is no longer protected by copyright and can be freely used by other people and producers.

The *talent release form* helps a producer to be sure that the person appearing on the screen agrees or will not later object to the material has been used from or about him. It may state: "I hereby consent for value received and without further consideration or compensation for the use (full or in part) of all videotapes taken of me and/or recordings made of my voice and/or written extraction, in whole or in part, of such recordings or musical performance for the purposes of illustration, broadcast, or distribution in any manner" (Media College, 2012).

3.5.5 Publicity and Promotion

The best show is worthless if no one knows about it. Producer wants people to see his project. He wants to win festival awards, secure distribution or broadcast, and to attract the attention of potential buyers. As the producer, he is the liaison between the program and the network, distributor, or festival, and it is important that he makes people aware of his work. This is where publicity comes into the picture. Hiring a publicist can be expensive.

Producer stays on top of any generated press or publicity material and carefully supervises what is appearing in the media about his project.
Social media helps a lot in publicity and promotion. It gives the producer the power to take an active role in managing the brand by creating interactive profiles or micro websites with project information. Social media gives an opportunity to get potential clients discussing the project, posting comments and reviews and continually promoting the brand of the show.

Everything the producer does must live up to the prevailing ethical standards. Producer has to respect and have compassion for his audience, because his decisions always affect the project and a very large number of people.

4 PRODUCTION

As soon as the studio got doors open for shooting or rehearsals, or a camcorder is loaded into the van for a field shoot, it means that production phase takes place. Except for rehearsals, production involves equipment and usually a crew – people who operate the equipment during the shootings. It contains all activities in which an event is video-recorded or televised.

The time spent actually recording the video or program is surprisingly short compared to the time spent organizing for it. Shooting can happen on location, in a studio or both. The decision might be based on the story, the time of year and the availability of a studio or location. However, often the decision is based on a budget.

4.1 The Television Camera

The television camera changes lights into an electronic signal that can be stored on videotape or digital computer memory, transmitted, and displayed on a television receiver or monitor. Television cameras are probably easier to operate than film or still cameras because the camera output can be watched and controlled as it was recorded.

4.1.1 How Television Camera Works

All television cameras, big or small, work on the same principle: they convert the optical image into electrons. The lens gathers the light reflected off of the object and focuses on the beam splitter, or also known as an imaging device, which splits the white light into red, green and blue pictures. These beams are directed toward their respective sensors (CCD or CMOS), which transforms the RGB lights into electrical RGB charges; these are amplified, processed, and then reconverted by the viewfinder into video pictures (Zettl 2009, 72-73).

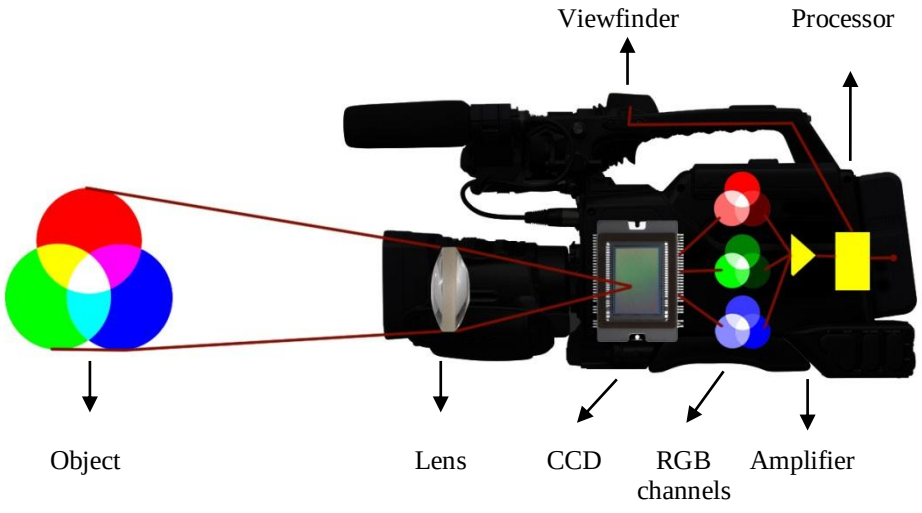

Figure 5 From light to video signal

The principal electronic component that converts light into electrical signals is called the ***imaging device***, also called sensor, pickup device or in technical language, it is usually known as the chip. There are two types of sensor in use: a charge-coupled device (CCD) and complementary metal-oxide semiconductor (CMOS). Both the CCD and the CMOS contain hundreds of thousand millions of image sensing elements, called pixels that are arranged in horizontal columns and vertical rows. Each pixel is a discrete image element that transforms color and brightness information into a specific electric charge with a unique computer address. The electric charges from all pixels in the end become the video signal.

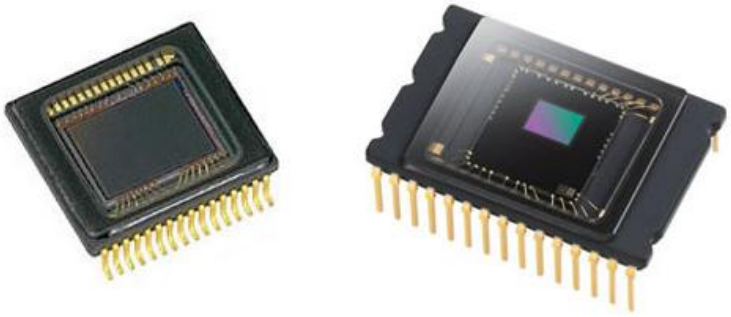

Figure 6 CCD (left) and CMOS (right)

Both types of imagers look similar and perform the same function but in different ways. In a CCD sensor, every pixels charge is transferred through a very limited number of output nodes to be converted to voltage, buffered, and sent off-chip as an analog signal. All of the pixels can be devoted to light capture, and the outputs uniformity, what is a key factor in image quality, is high. In a CMOS sensor, each pixel has its own charge-to-voltage conversion, and the sensor often also includes amplifiers, noise-correction, and digitization circuits, so that the chip outputs digital bits. These functions increase the design complexity and reduce the area available for light capture. With each pixel doing its own conversion, uniformity is lower. (Teledyne DALSA, 2012)

4.1.2 Adjusting the Camera

I would like to talk about modern camcorder on the example of Sony DSR-PD175P. I think this camera has class-leading picture quality, is designed for handheld operation, so it has proven workflow as for carrying it on the field as for using it on a tripod in the studio. Camera is affordable if we are talking about the price. The DVCAM camcorder has ClearVid array and Exmor image-processing technology for class leading picture quality and low light performance, CMOS sensors, works with 16:9/4:3 aspect ratios (Sony Professional, 2012). I have worked by myself with this camera at Ferris State University, Michigan, USA in 2011, and I stayed satisfied with the quality of image. See figure 10.

There are few electronic controls, such as pedestal, gain, white balance and viewfinder; and the manual controls, such as iris, zoom and focus on the lens. The modern television camera lens has three controls: iris, zoom, and focus.

Figure 7 Locations of iris, zoom and focus on the camera

Iris. The tiny ring closest to the camera body controls the amount of light passing through the lens to the light-sensitive surface of the pickup chip or tube. It is called the iris, aperture, or f-stop control and is marked off in f-numbers. The lowest f-stop lets in the most light, and the highest f-stop lets in the least amount of light. Some lenses have a "C" setting after the highest f-stop which means the lens is completely closed, no light pass through at all.

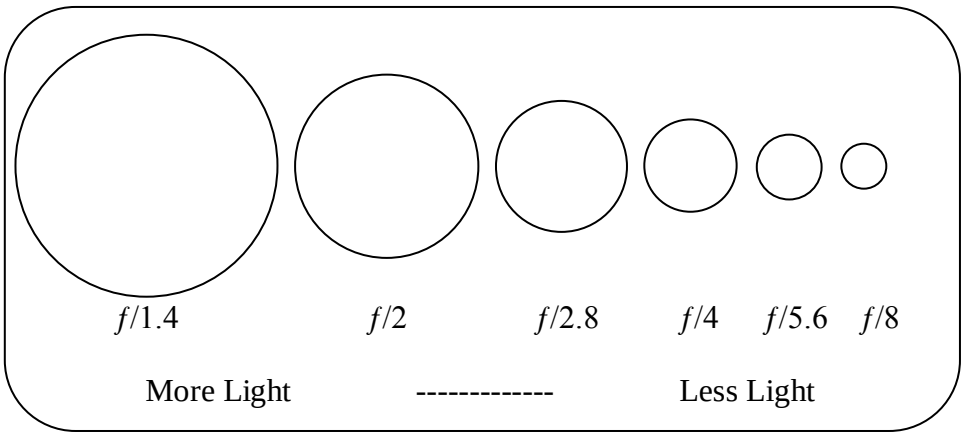

Figure 8 Diagram of decreasing apertures, that is, increasing f-numbers, in one-stop increments; each aperture has half the light gathering area of the previous one.

If the camera gets too little light, the image will look fuzzy and colorless. Bright light will produce sharp contrast. The correct settings are between these extremes; usually it is about one f-stop higher than the f-stop at which the bright parts of the picture lose details. Inman and Smith (2006) suggest that indoors it is often necessary to add light to get a good picture, when outdoors on bright sunny days it may be necessary to reduce the light reaching the pickup tube.

Zoom. The center ring on the most lenses is the zoom control. Most cameras use a rocker switch beside the lens. This allows changing the focal length of the lens through a range from a wide angle (short focal length) to telephoto (long focal length). A wide-angle setting makes the subject smaller as the angle of view is increased, called *zoom out*. Distance from the camera is exaggerated, with objects nearer the camera appearing strangely large. This is especially true for people who are too close to a wide-angle lens. Straight lines near the edges of the picture are often determined with an effect known as barrel distortion. When the angle of view is reduced, or *zoomed in*, then the subject looks larger. Distances from the camera are compressed.

Focus. The focus control is the ring farthest from the camera body, and nearest to the lens. Lens is focused simply by turning the ring until the image is sharp. If an operator wants the talents face to be in focus all the time independent of zooming during the shootings, he needs to zoom in all the way on the face of talent, adjust the focus that face is sharp, and then the image stays in focus through the entire zoom range. Depth of field is the area in which all objects, located at different distances from the camera, appear in focus (Zettl, 2009). Depth of field depends on the focal length of the lens, its *f*-stop, and the distance between the object and the camera. The main factors are shown below in the table 1. While all cameras with zoom lenses must control iris, focus, and focal length, the functions of the three rings described above may be automated or provided by remote control.

Table 1 Depth of field factors

Depth of field	Focal Length	Aperture	*f*-stop	Light level	Subject-to-camera distance
Great	Short (wide-angle)	Small	Large *f*-stop number (*f*/22)	High (bright light)	Far
Shallow	Long (narrow-angle)	Large	Small *f*-stop number (*f*/1.4)	Low (dim light)	Near

The following controls may be automatic or preset and therefore, not adjustable by the user. Those controls are pedestal, gain, white balance and viewfinder.

Pedestal or the "set-up" control sets the level of the darkest parts of the picture. On portable cameras, it is commonly automatic or entirely absent.

Gain control sets the level of the brightest parts of the picture. It is used to reduce the level when too much light is striking the pickup tube, but it does not make the picture brighter without making it grainy or not. Automatic gain controls can be extremely sensitive to even small bright areas of the picture, driving medium and darker parts into black.

White balance (WB) is the process of removing unrealistic color casts, so that objects, which appear white in person, are rendered white in the video or photo.

Figure 9 Incorrect and correct white balances (picture of Tuomiokirkko, Helsinki)

The color temperature of sunlight is different from an incandescent light bulb. Most consumer cameras now sense the overall color temperature and adjust color electronically. In older or professional cameras, it may be necessary with each change in location or lighting to "tell" the camera how to interpret color. (Inman & Smith 2006, 4) This is done by showing the camera a white card, which represents the total absence of color.

4.1.3 Camera Operations and Framing

Every operator should become familiar with the common camera movements. Expression *right, left, up* and *down* do not describe full range of option of camera movement.

Figure 10 Camera movements. SONY DVCAM Camcorder DSR-PD175P

According the Figure 10 and source material from Media College (2012) you can see examples of:

- ***Pan*** is a horizontal camera movement in which the camera moves left and right about a central axis.
- ***Tilt*** is a vertical camera movement in which the camera points up or down from a stationary location. If operator mounts a camera on his shoulder and nods it up and down, he is tilting the camera.

- ***Zoom*** is technically not a camera move as it does not require the camera itself to move at all. Zooming means altering the focal length of the lens to give the illusion of moving closer to or further away from the action.
- ***Pedestal*** means moving the camera vertically up and down with respect to the subject.
- ***Trucking*** is basically the same as track or dolly. Although it generally refers to side-to-side camera movement with respect to the action.
- ***Dolly*** is a cart which travels along tracks. The camera is mounted on the dolly and records the shot as it moves. Dolly shots have a number of applications and can provide very dramatic footage.
- ***Arc*** means move the camera in a slightly curved dolly or truck movement with a mobile camera mount. The arc shot is a camera move around the subject.
- ***Follow*** shot is when operator holds the camera and follows the action whilst walking. Hard to keep steady, but very effective when done well.

No matter is a camera big or small and lightweight to carry in hands, operator should mount it on a camera support when possible. Camera support reduces fatigue and prevents unnecessary and distracting camera motion. Using a *monopod*, or a single "pod", operator balances the support with one hand and operates the camera with the other. The most common mounting device for camcorders is the *tripod*. The most important criteria for a good tripod are that it is sturdy, easy to set up and level on any type of terrain, and, ideally, not too heavy. (Zettl 2009, 116)

There is a convention in the video, film and television industries, which assigns names and guidelines to common types of shots, framing and picture composition. The list below briefly describes the most common shot types (Media College, 2012).

Table 2 Shot types

Extreme Wide Shot (EWS)
the view is so far that the subject is not even visible. The point of this shot is to show the subjects surroundings. For example, in a war movie an extreme wide shot can show the scale of the action.

Very Wide Shot (VWS)
is much closer to the subject than an EWS, but still much further away than a WS. The subject is visible but only just (in this case it is a boy). The emphasis is very much on placing him in his environment.

Wide Shot (WS)
the subject takes up the full frame. The small amount of room above and below the subject can be thought of as safety room.

Mid Shot (MS)
shows some part of the subject in more detail. In fact, this is an approximation of how you would see a person if you were having a casual conversation.

Medium Close Up (MCU)
is half way between a mid-shot and a close up. This shot shows the face more clearly, without getting uncomfortably close.

Close Up (CU)
the subject takes up most of the frame. A close up of a person usually means a close up of their face. It emphasizes emotional state.

Extreme Close Up (ECU)
gets right in and shows extreme detail. You would normally need a specific reason to get this close. It is too close to show general reactions or emotion except in very dramatic scenes.

Two Shot
the basic idea is to have a comfortable shot of two people. Often used in interviews, or when two presenters are hosting a show.

Over the Shoulder Shot (OSS)
is framed from behind a person who is looking at the subject. This shot helps to establish the position of each person, and get the feel of looking at one person from the others point of view.

There are some rules of framing in photography. First of all it is recommended to look for horizontal and vertical lines in the frame, for example the horizon, poles, etc. Make sure the horizontals are level, and the verticals are straight up and down, unless the idea is purposely going for a tilted effect.

The rule of thirds divides the frame into nine sections 3 × 3. Important compositional elements should be placed along intersections or lines so that parts of interest should occur at 1/3 or 2/3 of the way up or across the frame, rather than in the center.

Figure 11 Rule of Thirds

"Headroom", "looking room", and "leading room" – these terms refer to the amount of room in the frame which is strategically left empty. The shot of the baby crawling has some leading room for him to crawl into, and the shot of his mother has some looking room for her to look into. Without this empty space, the framing will look uncomfortable. (Media College, 2012)

Some cameras have viewfinders or monitors that show the entire picture. Camera operator should allow for the shadow mask, or "safe area" mask or lines, to help composing the shots.

4.1.4 Basic Rules During the shootings

Zettl in "Television Production Handbook" (2009, 125-127) defines some useful tips for the shootings. If it is a big production project, then operator should put headsets on and ensure that he establish contact with director, technical director and visual operator. It is important to listen carefully to what director says to other cameras and personnel; it helps a crew coordinate better. Sign "On Air" means the show or video is being recorded at the moment, and crew has to concentrate on the production.

During the shootings, the camera should be unlocked, pan and tilt drags should be checked. If there is a teleprompter attached to the camera, all connections must be checked. Furthermore, operator needs framing guides. It is better to turn on the safe area brackets and the screen-center mark on the viewfinder, which is especially important to keep the action in the 4 × 3 screen area on a 16 × 9 screen. At each new camera position, the zoom must be calibrated, and operator makes sure camera stays in focus over the whole zoom range. When focusing on a person, the hairline gives enough detail to regulate the sharpest focus, in extreme close-ups focus on the eyes is the most proper. Is the lens clean? If it is dusty, the camel-hair brush, rubber bulb, and a can of compressed air will help, not the blowing with own mouth because the moisture will fog it up and get even dirtier. Camera should be capped if operator leaves for a prolonged period.

If there is a difficult truck or arc to perform, then the assistance of the floor person is needed, it helps an operator to be concentrated on the camera operation. It is recommended to use tape or draw on the floor to mark the critical camera positions. It is operators responsibility to keep out of the view of the other cameras and not hit anything, including floor personnel or talent during his movement. No doubt that for operator, it is difficult to be aware of the activity around. Especially the floor should be watched out so that operator does not suddenly face onto something. Cables and rugs are the constant hazard to camera movement. At the end of the shootings crew hears "All clear" signals, what means that lens can be capped, camera locked and pushed to its designated place, and cables coiled neatly in the customary figure-eight loops.

4.2 Lightning

Television is a means of changing patterns of light into electrical signals for storage or transmission and then recreating those patterns on a screen (Inman & Smith 2006, 5). The television camera must be presented with appropriately illuminated scenes. The three important considerations are level, contrast range, and color temperature.

Light is the narrow band of electromagnetic radiation to which the human eye is sensitive. There are no exact boundaries to the range of visible light, as individuals differ (Präkel 2007, 11). Naturally, human eyes are receptive to a range of wavelengths of light between 400-700 nanometers, as shown on the figure 12.

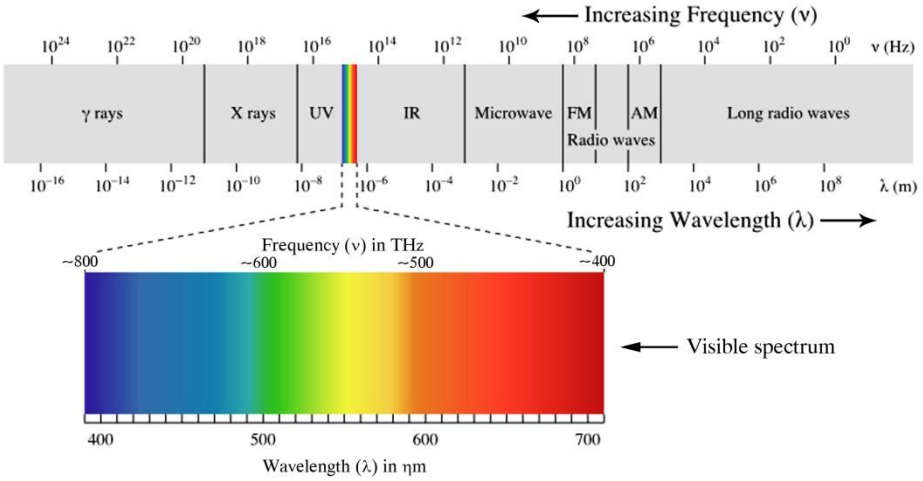

Figure 12 Electromagnetic Spectrum

White light passing through a prism in the camera creates all the colors of the rainbow, but only tree additive colors – red, green, and blue – are necessary to make up all the others. Lighting ***levels*** for television are generally set by adjusting the incident light, or the light striking the subject. (Inman & Smith 2006, 7) To measure the useful incident light, there is a meter, which is held near the subject and pointed toward the camera. The unit of measure for incident light in the meter is the American foot candle (fc) and the European lux, which is the amount of light produced by a standard candle at a distance of one foot. One lux is equal ten-foot candles.

Contrast refers to the difference in brightness from the brightest parts of a scene to the darkest. Common digital video signals are 24-bit color, with eight bits, each for red, green, and blue. This scheme allows for 256 individual shades from dark to light for each color. Since 24-bit color allows for over sixteen million colors, the limited numbers of shades available for each color are not usually a problem, although the luminance steps may be visible in monochromatic scenes. (Inman & Smith 2006, 6) Every source of light has a characteristic color. This color is related to its "temperature" (Inman & Smith 2006, 7). Lower color temperatures tend to be red or orange while higher temperatures tend to be green or blue, see figure 13. Color temperatures are measured in degrees Kelvin.

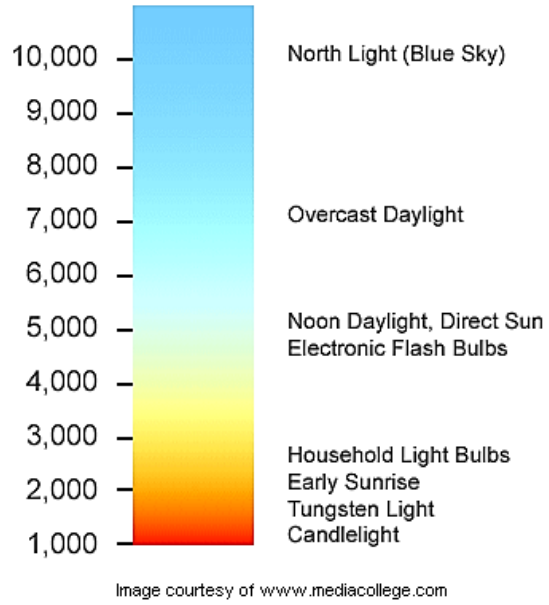

Figure 13 Color temperatures in Kelvin Scale

Temperature, °K	Source
2000	Candlelight
2900	Household light bulb
3200	TV Studio Lights
3400	Photoflood Lamps
3500-4000	Fluorescent Lamps
5500	Midday Sunlight
7000	Overcast sky

The eye "remembers" how things are supposed to look and interprets color accordingly, regardless of the color temperature of lighting sources. A white sheet of paper seems white whether viewed under an incandescent lamp or sunlight. The eye can even adjust for "correct color" when two light sources of different colors are present in the same scene. Sunlight streaming into a room which is also lit by incandescent lamps doesn't make objects it strikes appear bluish. (Inman & Smith 2006, 7) To be able to photograph in a range of lighting conditions keeping white appearing as white and not blue-white or yellow-white, there is a need to use light filters, or an appropriate film stock for a specific light.

In conclusion, I would like to say that for video production the relevant temperatures range is from around 2,000K to 8,000K. In practical terms this usually means selecting lights, gels and filters, which are most appropriate to the prevailing light or to create a particular color effect (Media College 2012). For example, a camera operator will select a "5600K filter" to use in shootings outside in the middle of a sunny day. Television lights are much more powerful than normal incandescent lights. They range from 25 watts for DC camera lights up to as high as 5000 watts. Lights used for electronic news gathering (ENG) or electronic field production (EFP) normally ranged from 500 to 1000 watts each. This presents problems whenever they are used in locations that were not intended for television recordings. (Inman & Smith 2006, 9)

4.2.1 Lightning Instruments

There are two basic kinds of lights used in television: spot and flood light. The *spotlight* has a narrow beam that casts well-defined light that can be adjusted from a sharp light beam like a focused flashlight to a softer beam is still highly directional but lights up a larger area. Fresnel spotlight is the most popular in studio production. It is lightweight, flexible and has a high output. This type of spotlight uses a glass lens that consists of concentric grooves or steps on its front surface, which forms the light into a soft-edged beam. The most common Fresnels are the 1kW and the two kW instruments in television studios. The second type of spotlight is the ellipsoidal spotlight. This lighting instrument produces intense, sharply defined light beams. The ellipsoidal spotlight is used primarily for special effects lighting. For example, to create "pools" of light reflecting off the studio floor, the ellipsoidal spotlight would be the perfect instrument to use. Even when the Fresnel spotlight is in its focused position, it cannot emit as sharp an outline as the ellipsoidal.

Floodlights are designed to produce a great amount of highly defused light. They are often used as principal sources of light in situations where shadows are to be kept to a minimum, such as news sets and product displays; to reduce contrast between light and shadow areas; and provide a base light. There are four basic types of studio floodlights: the scoop, a rugged, all-purpose peculiar scoop like reflector; the soft and broad light, which produces extremely diffused light and used for illumination with slow falloff; the fluorescent floodlight, which major advantage is that it does not get as hot as incandescent light of equal output; and the strip or cyclorama light, used to illuminate large areas.

Figure 14 Fresnel (left) and Floodlight (right) lights

Scrims are special disks of screen wire that can be used to soften lights and reduce their intensity slightly (Inman & Smith 2006, 9). Lamps and housing become extremely hot when they are in use. Hot lamps should be handled only with protective gloves to prevent burns. On the remote locations are used the same lighting instrument but of smaller sizes. Portable spotlights are easy to set up and transport; they usually come with the lights support systems, which hold them in the correct position such as ballasts or light stands and clamps. When there are not enough light outdoors, then collapsible reflectors become very useful for additional highlighting of the object or talent. The reflector can be folded up for easy transport as well. It has a silver-colored reflector on the one side and gold-colored on the other.

4.2.2 Lightning Techniques

In lighting there are two goals: get enough light; use the light you have to shape and define objects in the scene. Lighting is often tried out "on paper" by using a lighting diagram before it is actually set. Many potential problems can be spotted in the process of constructing a lighting diagram. The most common of these is to light for a theoretical "stage front" instead of lighting for specific camera positions. It is also useful in anticipating problems with shadows falling where they are not wanted. Every light casts a shadow. The lighting diagram will make it easier to see where those shadows might fall. (Inman & Smith 2006, 11)

For people who work with lighting there is a very good online portal Strobox, where photographers share their own creations, discuss different techniques and learn each from other. You can see the different lighting techniques achieve different effects on the images below. Image courtesy Strobox.com

Figure 15 Single Light.

Figure 16 Multiple Lights.

The ***Three Point Lighting*** technique is a standard method used in visual media such as video, film, still photography and computer-generated imagery. It is a simple but versatile system which forms the basis of most lighting.

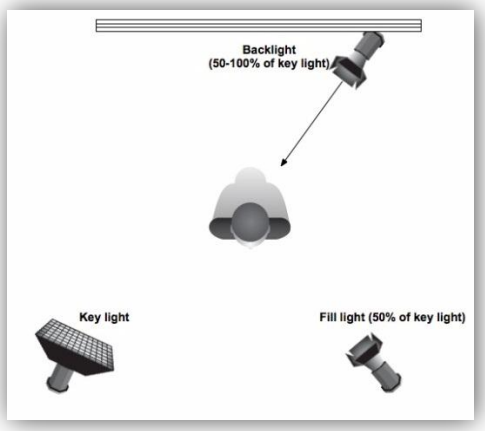

Figure 17 Three Point Lighting

Key Light

The first light set is usually the key light. It is positioned thirty to forty-five degrees to the side of the camera and should strike the subject at an angle of about forty-five degrees from vertical (Präkel 2007, 117). This lighting angle is best for people with normal features. People with short noses or weak chins should be lit from a steeper angle to increase the length of the shadows cast under the nose or chin. Those with long noses should be lit with fewer angles to produce shorter shadows. Moving the light closer to the camera will reduce the amount of modeling in the face and make the subject appear heavier than he is. Conversely, moving the light farther from the camera will throw more of the face in a shadow, making it appear narrower. The key light is focused on the subject by putting the bulb in the "full spot" position and centering the beam on the subject. (Inman & Smith 2006, 11-12)

Fill Light

Fill light is added on the side of the camera opposite the key light. Fill light should be about half the intensity of the key and back lights. It should also be softer, producing no harsh shadows. Often a broad, scoop, or soft light is used instead of a spotlight to provide fill. Fill lights are also frequently scrimmed to soften them and reduce their intensity. (Inman & Smith 2006, 12) Shooting videos indoors with external windows is a common issue for video makers. The large difference in light levels between the room and the outside view challenges finding the correct exposure. It is highly recommended to avoid reflections on the face and eyes from glasses, to do this may need only adjusting the position of the person or the lights.

Back Light

The back light is positioned directly behind the subject. It is spotted down and pointed at the subjects neck. People with blonde or missing hair requires less intensity, and over wise, people with very dark hair require more. When the back light is too bright in the full flood position, a scrim can be fitted in front of the housing to soften and reduce the light (Inman & Smith 2006, 12). The back light helps to separate the subject from the background and provide a three-dimensional look.

4.3 Audio

In most video programs, it is the audio portion that organizes and makes the visual intelligible. For some types of programs, the absence of sound would make the production completely useless even with the best visuals. Ideally, though, if attention is given to high values in both audio and video, each serves to compliment the other. The result is a program that communicates powerfully and effectively. (Inman & Smith 2006, 31)

Sound is important for creating mood and intensifying an event. Some of the shows carry sound throughout the dialogues. Most of the viewers are hardly aware of the nonverbal track. The sound helps audience structure the quick cuts and the visual fragments of a line of close-ups to form a meaningful whole.

Unfortunately, it is often assumed that sticking a microphone into a scene at the last minute will satisfy the audio requirements. It is not true. Good television audio needs as much preparation and attention as the video portion. And, like any other production element, television audio should not simply be added – it should be integrated into the production planning from the very beginning. (Zettl 2009, 139)

4.3.1 Sound Pickup

Sound pickup device converts mechanical vibrations into electric oscillations in order to reproduce mechanically recorded sound (Darkin & Ewbank & Hull 2008). The pickup of live sound is done by a variety of microphones. Is the microphone good or bad depends not only on how it is built but especially on how it is used. According Zettl H. (2009, 140-141) there are three major types of microphones classified by how they hear.

Dynamic microphones can be worked close to the sound source and withstand high sound levels without damage to the microphone or distortion of very high-volume sound. *Condenser* microphones are more sensitive to physical shock, but they produce higher quality sound when used at greater distances from the sound source. *Ribbon* microphones produce a warmer sound and are strictly for indoor use, they are frequently preferred by singers. The territory within which a microphone can hear equally well is called its *pickup pattern*.

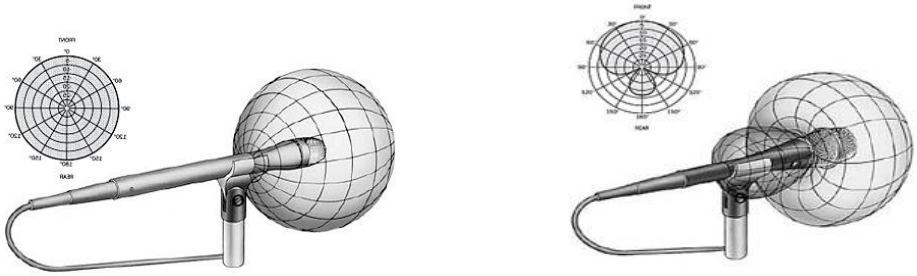

Figure 18 Omnidirectional (left) and Supercardioid (right) pickup and polar patterns

The omnidirectional pickup pattern is like a sphere with the microphone in its center. All sounds that originate within its pickup pattern are heard by the microphone without marked difference. The supercardioid, hypercardioid, and ultracardioid microphones pickup patterns narrow the sound pickup. They have a long but narrow reach in front and eliminate most sounds coming from the sides.Microphones are designed for different purposes. Some of them are used for moving courses, other for handheld, and other for general sound pickup.

Lavalier microphone is probably the most often used in TV production, because of their size, ease to attach, and high-quality sound. They are designed primarily for voice pickup. The microphone has a clip, so it can be simply attached to the clothes.

Hand microphone is rugged, has a built-in windscreen, and is insulated to prevent rubbing sounds from the talents hand. When it is used in a fairly quiet environment, the hand microphone should be held chest high, parallel to the body; but in the noisy environment, it must be placed closer to the mouth.

Boom microphone is widely used in television and film production. It is mounted or attached to a pole or arm, so it frees the hands and allows amplifying a group conversation, as it can be positioned from-above or from-below so that everyones voice can be heard. ***Wireless microphone***, also known as a radio microphone, is a cordless microphone that operates on a battery-powered pack hidden under clothing on the speaking person.

4.3.2 Sound Control

The major audio components of audio equipment in the studio are the audio console, the patchbay, and audio-recording systems. **Audio console** called also a mixer, a device that takes the inputs of a number of microphones and combines them into one output for the recorder. On the front panel of the mixer are gain controls that adjust the sound level for each microphone. By turning some down and others up, sounds get the right "mix", because certain sound sources are louder than others. All audio consoles, or audio control boards, are built to perform five major functions (Zettl 2009, 168):

- *Input*: to amplify and control the volume of the various incoming signals. Each module of the audio console contains a volume control or slide fader; various quality controls, such as equalizer, the mute, pan pot, which moves sound horizontally from one stereo speaker to the next; and assignment switches. For example, there are inputs for audio from microphone 1, microphone 2, microphone 3, CD, DVD, B-roll playback, etc.
- *Mix*: to combine and balance two or more incoming signals, such as two lavalier microphones, background music, and sound effect of a phone ring. With the mixing capability of a board, different sounds input can be controlled at the same time.

- *Quality control*: to manipulate the sound characteristics, such as equalization, filter, and reverberation. Equalization is the process of controlling the audio signal by emphasizing or eliminating certain frequencies. Filters eliminate automatically all frequencies above or below a certain point. The reverb control can add an increasing amount of reverberation to each of the selected points.
- *Output*: to route the combined signals to a specific output. To ensure that the mixed signals stay within the acceptable volume limits, they are regulated by final volume control – the master pot – and metered by volume indicator volume-unit (VU) unit. Modern consoles have at least two output channels to handle stereoscopic sound or to feed headphones and a video recorder simultaneously with two identical but independent signals. HDTV requires surround sound, which involves multiple discrete output channels and a variety of speakers.
- *Monitor*: to listen to the sounds before or as their signals are actually recorded or broadcast. It lets audio board operator hear the final sound mix or allows him to listen to and adjust the mix before switching it to the output.

Patchbay's primary function is to connect and rout audio signals to and from various pieces of equipment. This can be accomplished by using actual wires that establish specific connections or with a computer that rearranges the signals and sends them according to operators instructions. Patchbays make it easier to connect different devices in different orders for different projects, because all of the changes can be made at the patchbay.

Audio-recording system can be analog or digital. In professional television it is done digitally and tapeless, because it allows production personnel to see a visual display of recorded sound and make the editing more precise and digital format can prevent loss of quality. Digital recording converts the sound signal picked up by the microphone to a digital form by a process of digitization, allowing it to be stored and transmitted by a wider variety of media. Digital recording stores audio on the digital cart system, mini discs and flash memory devices, and optical disc system with a variety of CD and DVD formats.

4.4 Video Recording

Although there are many sources of video, all fall into two categories: electronically generated sources and optical sources. Electronic sources include all the standard test signals, character generators, computers, and background generators. Optically generated video is produced by television cameras. (Inman & Smith 2006, 48) Video recording is used for the building the show, time delay, program duplication and distribution, and creation of a protection copy of a video recording for the reference and study. In recording preparations is important to schedule everything carefully. Having an equipment checklist helps not to forget any detail, because it can cause a disaster, if there is wrong cable, uncharged battery, missed dubbing, wrong recorder, incorrect or not enough media.

There are elements still needed an attention during the production: video leader, recording checks, time code, and recordkeeping.

Video leader helps adjust the playback and record machines to standard audio and video levels. Before the actual video plays, there is blank space for threading, 30 to 60 seconds of color bars for color correction, 15 seconds of slate with the visual information about the each take, eight seconds black or leader numbers, about two seconds of black, and only after that starts the program video.

Operator should check the video recordings by doing brief test recording, and then playing it back and ensuring that the whole system work properly, the video and sound signals are actually recorded. Time code is used for synchronization, logging and identifying material in recorded media. It must be recorded on its designated address track simultaneously with each take. Recordkeeping, or the log, is kept by the video-record operator during the shootings. It indicates the media, or reel numbers, approximately where take is located on the memory drive, and other information useful in postproduction editing.

4.4.1 Electronic Features of Video Recording

Types and functions of video-recording systems and the major electronic features determine the quality of the video. There are several broadcast television systems, which describe frame rates, image resolution and audio modulation in different ways:
NTSC (National Television System Committee),
PAL (Phase Alternating Line), and
SECAM (Séquentiel couleur àmémoire, French for "Sequential Color with Memory").
Use of NTCS, PAL and SECAM globally are displayed on the figure 19.

The NTSC systems picture consists of 525 horizontal lines, 60 fields, and video bandwidth 4.2 MHz with a frame rate of 29.97 frames per second. Both PAL and SECAM signals have 625 horizontal lines 50 fields, video bandwidth 5.0 MHz with a frame rate of 25 frames per second. Because of the slower frame rate both are able to display more picture detail than the NTSC system.

PAL and NTSC have slightly different colour spaces, but the colour decoder variances are ignored. NTSC receivers have a tint control to perform colour correction manually. If this is not adjusted properly, the colours may be faulty. The PAL standard automatically cancels hue errors by phase reversal, so a tint control is unnecessary. Chrominance phase errors in the PAL system are cancelled out using a 1H delay line resulting in lower saturation, which is much less noticeable to the eye than NTSC hue errors.

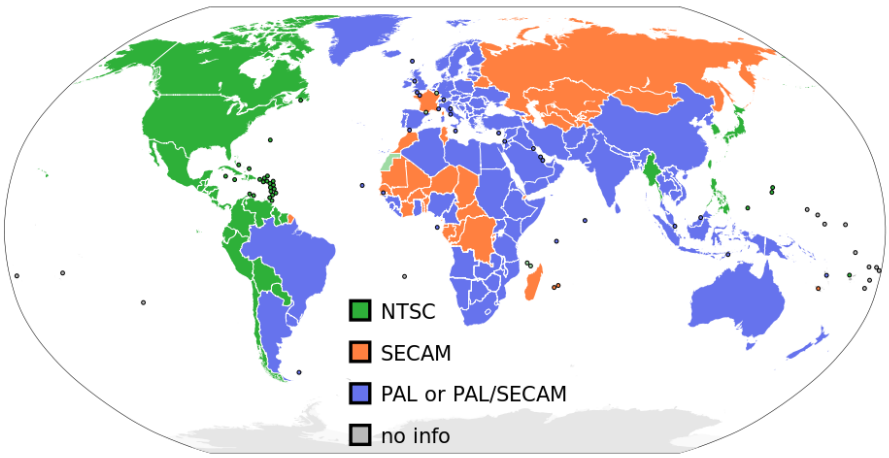

Figure 19 Television color encoding systems.

Analog and digital recording systems treat their video using composite or component signals. Video-recording systems that use composite signals throughout the recording process are not compatible with component systems. For example, a recording made in the France could not be played on an American DVD player, all because of different encoding system standards. Video- recording using a composite signal is not as good as one that uses a component (Zettl 2009, 256).

Composite video is the format of an analog television signal before it is combined with a sound signal and modulated onto a Radio Frequency carrier. In the past, all video was recorded from a composite path. Its luminance, chrominance, horizontal and vertical synchronizing were combined into one analog signal. Composite video is often easier to shoot and broadcast, but it has softer image clarity and loses quality quickly after one or two generations. It needs a single wire to be transported. Formats include 1", ¾ ", U-Matic, and VHS (all analog) and digital formats of D2 and D3.

Component video is a video signal that is split into two or more components. The component system separates the luminance and color information. It uses two wires to carry the separate signals. Component video retains sharper detail and with more color clarity, and is a much cleaner way to edit. There is no loss of quality when it is dubbed down several generations. Examples are digital formats Betacam, DCT, D1 and D2.

4.4.2 Storage System

Despite the great variety of video-recording devices, there are basically two types of systems: tape-based and tapeless. Tape-based systems can record analog or digital signals; tapeless systems can record only digital information. The great advantage of a tapeless operation is that vast amounts of information can be stored and archived on media that take up very little space, and the information can be retrieved much faster than if it were stored on the videotape. (Zettl 2009, 248)

Tapeless digital studio video recorder has a large-capacity hard drive and provides a wide range of analog and digital video and audio outputs (Darkin & Ewbank & Hull 2008). Let's look at the main features of hard drives, optical disks, and flash memory.

There are different types of **hard drives**, ones are in our computers and laptops, and others create a big video server. The easiest way to store and retrieve digital video and audio information for postproduction editing is with *large-capacity external hard disks*. Accelerated hard-drive speeds and highly efficient compression techniques enable to store hours of video and audio and call up any frame in a fraction of a second. Many television stations use video servers, which are especially sturdy, large-capacity disk arrays that record, store and play many hours of television programming. Portable hard drives are usually built into the camcorder or can be docked with cameras. They are rated in gigabytes of storage, and can hold several hours of high-quality video and record time code and two- or four-channel audio.

There are a variety of **read/write optical disks** that record and play back a great amount of digital data. The most often used for storing video optical disk is DVD, or Digital Versatile Disk, and Blu-ray, which can be played only on its own Blu-ray system. Some cameras use optical disks rather than hard disks as their recording media. The advantages of read/write optical disks are that they are easy to store, and they permit extremely fast access time. The disadvantage is that they must be handled very carefully, because a single scratch can ruin days of work.

Flash memory devices, also called among other names flash drives and memory cards, are solid digital storage media. Their biggest advantage over hard drives and optical disks is that they have no moving parts, they are small and lightweight. Video flash cards can be used over and over again without any noticeable deterioration. The downside is that even large cards have a relatively limited storage capacity, and are outrageously expensive considering the cost per gigabyte of storage.

4.5 Switching, or Instantaneous Editing

The heart of any video control room is the special effects generator, or video switcher. This is the device used to select pictures from the various video sources and to create the effects which are the "language" of television. (Inman & Smith 2006, 55) There is three basic function of a production switcher: to select an appropriate video source from several inputs, to perform basic transitions between two video sources, and to create or access special effects (Zettl 2009, 270). On the figure 20 is represented a very simple switcher Panasonic AV-HS400A Compact Live Multi-Format HD/SD Switcher with MultiViewer and its layout: program bus, mix buses preview bus, effect bus, multifunction switcher, additional switcher controls, fader bar.

Figure 20 Switcher Panasonic AV-HS400A Compact Live

The **preview bus** allows a technical director, who operates the switcher, to see the source image on the preview monitor, how it looks, and to do any required adjustments of position, rotating or an effect. The row of buttons, called **program bus,** sends everything from a preview bus "on air", or in other words, directly to the line-out. **Key** in this situation means lettering or an image inserted into a different background picture.

The most common special effect is the "take." It is the instantaneous change from one picture source to another. The common reason is that it is the most appropriate way to change picture content during a program. The program content must carry and maintain the interest of his audience. Any attempt to "dress up" a program with unnecessary effects will simply distract or confuse the audience and will, therefore, be self-defeating.

The next commonly used effect is the dissolve. This is a gradual cross-fade from one picture to another during which one picture is superimposed on the other. The speed of the dissolve should be determined by the pace and mood of the program material.

The wipe has fewer ambiguous uses. When a complete wipe occurs, one picture is replaced by another as though it were pushing the other off of the screen. Most switchers offer a number of wipe patterns, including horizontal, vertical, various corners, circles, and perhaps some others of limited usefulness.

Keys and mattes are used to insert one picture into another. Any portion of the keyed signal reaching a specific video level replaces the video content of the background signal. The amount of luminance necessary to affect this replacement is adjusted to achieving the desired effect. Luminance keys and mattes are used almost exclusively to superimpose text or graphics on the screen. A character generator, for example, uses a luminance key to put text over normal video. Chroma keys are used to insert more complicated video into the background. (Inman & Smith 2006, 55-56)

4.6 The Actual Shoot

Director tells talent and the entire production team what to do before, during, and after actual production. Television director expected to be an artist who can translate ideas into effective pictures and sounds, a psychologist who can encourage people to give their best, a technical adviser who can solve problems the crew would rather give up on, and a coordinator and a stickler for detail who leaves nothing unchecked (Zettl 2009, 336).

When all the equipment, the crew, and the talent are in place and ready, it is time for the shoot. The director calls for action "lights, camera, action" and the camera operator and the audio engineer both confirm by saying, "up to speed."

Some productions use a *slate*, or *clapboard*, which is held in front of the camera each time it rolls. This slate gives relevant details such as the name of the producer and director, what camera is in use, the scene number, take number, date, and the projects title. Other video productions might use a smart slate, which matches the cameras time code with the audio. (Kellison 2005, 139)

There is special communication language in the studio and control room. Directors' cues are short and precise. For example, he tells the TD "preview camera 2" or "ready camera 2", technical director pushes the preview button for camera 2 on the switcher preview bus; director says, "take camera 2", TD pushes the program button of camera 2 on the program bus, and the image from camera 2 is on air now. Before bringing the camera live, director can adjust composition, angle view, or zoom by telling camera operator what to do through the headsets. I have listed the major directors cues in appendix 2.

4.7 Field Production

Electronic field production (**EFP**) is a television video production which takes place in the field, outside of a television studio, in a remote location or special venue. Typical applications of field production include awards shows, concerts, major newsmaker interviews, political conventions and sporting events.

There are advantages to take the production out of the studio. Electronic field production allows for a richness of scene and artistic creativity born sometimes out of necessity and sometimes out of opportunities suggested by the location itself (Inman & Smith, 2006). An event can be placed and observed in its real settings or select a specific location for a fictional event. Natural lights, sounds and backgrounds are available to use as long as they accomplish technical and visual production requirements. Unless it is a big remote or complex EFP there is opportunity to save on crew and equipment because many field productions need less equipment and production people than similar studio production. Also the rental costs for the studio and studio scheduling can be avoided.

But there is other side of the coin. Field production does not afford the good lighting or high-quality audio. Weather conditions always present hazard; rain, cold, or even heat outside can delay the production for days. The production becomes location-dependent, which means that some locations require cooperation with nonproduction people. For example, there is needed help of police control on the traffic when the shootings are in the city center on the busy streets. When production takes place in the city, municipality, or federal property, a permit form and additional insurance are needed. EFP also require crew travel and lodging as well as equipment transportation.

Electronic news gathering (**ENG**) is the most flexible remote operation, because the only one person with a camcorder can handle a complete ENG assignment. The major production features of ENG are the readiness with which the reporter can respond to an event, the mobility possible in the coverage of an event, and the flexibility of ENG equipment and people (Zettl 2009, 385). The event can be video-recorded or transmitted live with ENG equipment. Most ENG vehicles are equipped with a microwave transmitter, which can establish a transmission link from the remote location to the station.

A **big remote** is done to televise live large scheduled events that have not been staged specially for television, such as sport events, parades, and political gatherings. All big remotes use high-quality field high-zoom-ratio cameras in key positions, a number of floor ENG/EFP cameras, and an extensive audio setup. The cameras and the various audio elements are coordinated from a remote truck, or a mobile control center.

5 POSTPRODUCTION

The key activity of postproduction consists of editing of the video and audio. There are a lot of editing technics; it may include color corrections of the individual video clips, the selection of appropriate background music, and creation of special audio effects or 3D animation for video. The postproduction activities may take longer time than the actual production.

5.1 Editing

The rapid evolution of post-production technology over the last few years is virtually unprecedented. As it steps into the digital domain, the advances in digital editing and sound design equipment have expanded the producers' horizons. From prime time broadcast to art gallery installations, from educational teaching tools to high-end commercials, todays digital tools are limitless. The operational principle of **nonlinear editing** (NLE) is selecting video and audio data files and making the computer play them back in a specific sequence. All nonlinear editing is done by selecting and sequencing shots that have been transferred from camcorder to the computer hard drive of an editing system. (Zettl 2009, 422)

Film editing has always been nonlinear, done with tape and scissors, and its pieces cut and pasted together by hand. Before nonlinear editing, video editing was **linear**, or electronically edited in an "always moving forward" direction. An editor could only start at the beginning and work toward the end because of the nature of electronic recording. The traditional way of editing video has been to edit in the chronological or lineal order that shots appeared in the piece. (Kellison 2005, 150)

Editing with digital software is done in a cut-and-paste mode. The popular NLE systems like Final Cut Pro, Avid Xpress, Premier Pro, Media Composer, and iMovie work on similar principles. When an editor has learnt one system, it is simple to use and find out the right buttons in the right place on a similar system. Final Cut Pro and Avid are the systems currently used by most professionals. They offer high-quality options for finishing, are consistently updated, and support more plug-ins. As official websites of Apple and Avid stand, Final Cut Studio 3 costs about €950 while Avid Media Composer 6 costs €2 500, cited 25.3.2012.

According to Kellison (2005, 151-153), there are several steps in the nonlinear editing system to edit a project. The footage has to be transferred or ***downloaded***. After all the footage, audio, and graphic elements have been loaded into the NLE, the editor puts together at the beginning ***rough cut***. It forms the core of finished piece, and affects all the basic editing decisions. Some editors refer to the rough cut as a radio or an A-roll edits. This describes the whole process by laying down all the sound bites and making sense of the projects narrative viewpoint. The next step is to make it visually interesting by editing in all the video footage.
Editor makes an edit decision list (EDL) that provides exact notes of all the reel numbers, time codes, cuts, and transitions in the rough cut. Throughout editing, the editor works with the audio tracks: separating

them, balancing out levels, and keeping track of where everything is in the computer. Most projects take time to edit, and the edition process usually requires several cuts before the audio is accepted. After members of the team agree that the audio version is as planned, editor goes into the NLE and outputs the ***final cut*** of the project.

5.2 Delivering the Final Product

Producer wants to deliver a project with the possible highest quality. It may be broadcasted via Network. It can be sold to a distributor, or it can be used for training and education purposes. These venues require broadcast-quality work that follows the certain technical standards, which make it possible to dub, copy, transfer to DVD or other formats without losing quality. Most clients have very specific requirements of the final products. Deliverables are generally part of the overall contract with a client, so a producer needs to find out exactly what their expectations and specifications are. For example, video and audio format, length, dubbing, abridged versions, and subtitling.

Producer has to make sure that client, cast and crew, potential buyers, distributors, or investors will receive the copies of the project. It shows professional courtesy when the producer sends copies of the final product to key persons. Dubs can be expensive because they require copying, labeling, packing, and shipping.

5.3 Professional Next Step

At this stage producer has a tangible product that he can see on the screen, he has delivered all the final dubs to the client, and said good-bye to the editor and other members. However, the project is not still finished. There are more details to wrap up. When all the final bills have come in, producer should review each one for accuracy. Checking bills, purchase orders, and comparing original estimated budget with what have actually been spent during the production will help to see the income from the project.

It is very nice to organize the wrap party and screening party. These are two different but important parties. First, one is for the crew and cast, and is more informal, just to thank people for their time, efforts and energy. The second one will help to promote the project, sell it and get potential investors. Screening party is a premiere of the project, and it is planned more carefully and formal. The project will be introduced and then screened. It is a great opportunity to socialize with the press and potential buyers.

Seasoned and experienced producers are no different from a motivated first-timer – they all take advantage of a few simple tricks of the trade to build and expand their careers. They also realize that no matter what project they are working on now. It will eventually be over, and they will be looking for their next job. As a producer of any kind of TV or video pro-

ject, he wants people to know about him and the quality of his work. (Kellison 2005, 168)

Creating a *resume* or formal academic curriculum vitae (CV) will help to keep all accomplishments up-to-date. In the video production industry, the purpose of a *demo reel* is to reflect professional abilities, creativity, and technical know-how of a person. Each producers demo reel is unique, because it reflects his or her specific vision and talent. Kellison (2005, 169) recommends that the demo reel contain short clips and excerpts of the best work. They can be edited to a music track with quick cuts, or clips with special effects and wipes, 3 to 4 minutes long, and with best work at the beginning and at the end. A demo reel should open and close with graphics that include the name and contact information of the person.

When the producer looks for a job or new project, the network can be useful. Agents and managers can be helpful, but most producers find work opportunities from people they know. Producer can find out future employer in TV and film industry organizations, on web sites and blogs, in classes, internships, and at festivals. Festivals are a fertile ground for networking. Producer can meet other producers, film-makers, writers, directors, attorneys, agents – any of whom are potential collaborators in future projects.

6 DISCUSSION AND CONCLUSION

I put three main objectives in front of me in writing this thesis "Television Production". First was to examine the steps of production. The second aim was to determine the technologies used in the production. And the third was to observe the role of the producer in different production phases.

This work has been divided into three main parts. The first part deals with the preproduction stage and tasks must be done for the project start. By detecting them I learned which methods are useful for generating an idea; how to write competence program proposal; how to plan the budget; the purpose of the detailed script; and how it is important to do all planning carefully and in advance.

The next big part of this work describes the production stage. Here I investigated the professional skills required in the television production, including studio workflow, field equipment, camera operation, lighting techniques, sound pickup and control methods, multicamera directing, and the video recording features. It helped me to get familiar with the latest trends in modern TV production technology. I explored how the television production is done in the studio facilities or outside on the field together with shootings on the streets, concerts or sport events.

Finally, the postproduction stage is defined in the third part. In this case I gained the knowledge in editing systems, non-linear editing workflow, high-definition television and 3D television. I analysed the steps of delivering the final product and the way to close the project professionally.

By writing this work I wanted to show how the technology was managed by the producer. I have learned the responsibilities and organizational expertise of the producer in different production stages. Observing the role of the producer in television production made me recognize that this is the perfect profession for me.

I have read several books and electronical materials on different topics about phases of the production, equipment and techniques, communication and documentation. Furthermore, I have used knowledge from my own experience, which I got while studying and making practical tasks at Television and Digital Media Production program at Ferris State University in United States of America in 2010-2011.

My thesis would be interesting for future students and their works and projects, because they can use information I have gathered in my research. Also this information can be used to develop the picture of the television production and its main stages in the beginning of XXI century. There are a number of important studies about the modern television techniques and equipment used in television production. Another important practical implication is that future student can use examples of budget template, storyboard layout or the project proposal, because I combined most useful parts from different sources. The information of this field of study in my thesis has an amount of important implications for future practice.

REFERENCES

Pressed sources:

Darkin C. & Ewbank J. & Hull R. 2008. The New Digital Video Manual. London: Carton Books Ltd.

Inman R. & Smith G. 2006. Television Production Handbook. Cited 12.3.2012. http://www.tvhandbook.com/Television%20Production%20Handbook%202006.pdf

Kellison, K. 2005. Producing for TV and Video, A Real-World Approach. Burlington: Elsevier Science.

Noble B. 2009. Interview with PHIL EK. Hit Quarters. Cited 12.3.2012 http://www.hitquarters.com/index.php3?page=intrview/opar/intrview_Phil_Ek_Interview.html

Präkel D. 2007. Lighting. Singapore: AVA Book Production Pte. Ltd.

Underwood R. 2007. Roll! shooting TV news: view from behind the lens. Oxford: Elsevier Inc.

Zettl, H. 2009. Television Production Handbook. Belmont, CA: Wadsworth.

Electronic sources:

Cambridge in Colour, 2012. Official Web Site. Cited 17.3.2012. http://www.cambridgeincolour.com/tutorials/white-balance.htm

Media College, 2012. Free resources for film & digital media production. Cited 19.3.2012. http://www.mediacollege.com/

NHK – Japan Science & Technology Research Laboratories 2011. Next-generation Broadcasting Media. Cited 25.3.2012 http://www.nhk.or.jp/strl/english/

Panasonic Broadcast & Television Systems Company 2011, Multi-format Live Switcher AV-HS400AN Operating Instructions. ftp://ftp.panasonic.com/pub/Panasonic/business/provideo/manuals/AV-HS400AN_oi.pdf

Sony Professional, 2012. DSR-PD175P. Official Web Site. Cited 16.3.2012. www.sony.co.uk/biz/product/dvcamcamcorders/dsr-pd175p/benefits

Strobox: Create, Share, Learn, 2012. Cited 21.3.2012 http://strobox.com/
Teledyne DALSA Semiconductor & MEMS Foundry, 2012. Cited 19.3.2012. http://www.teledynedalsa.com/corp/markets/ccd_vs_cmos.aspx

Image courtesy:

ADB Lightning Systems, www.adblighting.com

Camcorder Info, www.camcorderinfo.com

Media College, www.mediacollege.com

Panasonic Corp., www.panasonic.com

Sony Corp., www.sony.co.uk

Strobox, www.strobox.com

Wikimedia Commons, www.wikipedia.com

Appendix 1.

CAMERA TYPES

Camcorder, Sony PMW-EX1

Television Camera, SONY - HDC-1000

3D Camera, Panasonic Pro Twin-Lens 3D Camera

Appendix 2.

DIRECTORS CUES DURING THE SHOW

Beginning

Take Avid with sound **Standby on set**	Avid operator plays the opening titles of the show Talents on the set are quiet, ready to act
Ready to sneak music under **Ready to open mics** **Ready to dissolve cam3** **Ready to cue host**	Audio Engineer (A) is ready Technical Director (TD) is ready Stage manager is ready
Open mics **Dissolve cam3** **Sneak music under** **Cue host**	A opens the microphones on the audio board TD dissolves video from camera #3 A brings the audio from opening titles down Stage Manager cues the talent to act or talk
Bring music under **Ready 2** **Take 2, Ready 1** **Take 1, Ready 2** **Take 2**	A kills the audio from opening titles TD is ready to take the camera #2 TD takes the camera #2, puts camera #1 on preview TD puts cam 1 on the program bus, cam 2 on preview, etc.

During the Show

Preview name key **Key In, Key Out**	TD prepares to bring the lower third (name of the speaker) TD brings In/Out
Ready to roll CD **Roll CD**	A prepares to roll CD A push play on CD player, brings the audio on air
Ready to roll Avid **Ready to dissolve Avid** **Roll Avid** **Dissolve Avid**	Avid operator is ready to play a B-roll from NLE TD is ready to dissolve the video Avid operator plays a B-roll from NLE TD dissolves the video

Closing

30 sec cue **Wrap Up cue**	Stage Manager shows the card 30 SEC to a talent Stage Manager shows the card WRAP UP to a talent
Ready to roll Avid **Ready to dissolve Avid**	Avid operator is ready to play a B-roll from NLE TD is ready to dissolve the video
Ready 2, Take 2 **Ready 3, Take 3**	TD brings the cam 2 on live; Talent says final words, fare-wells TD brings the cam 3 on live; the picture of the whole set
Roll Avid	Avid operator plays a final titles video
Bring music in **Dissolve Avid** **Kill the mics** **Music at full**	A sneaks in the audio from final titles video TD dissolves the final titles on air A closes the microphones on the audio board A brings the audio from final titles video up at full
Ready to roll credits **Preview credits**	Computer Generator (CG) operator is ready to roll credits TD puts credits on preview screen
10, 9, ..., 3, 2, 1 **Roll Credits** **Ready to dissolve black with sound**	Producer countdowns to the credits rolling CG operator plays the credits TD is ready to dissolve black and A is ready to kill the music
10, 9, ..., 3, 2, 1 **Dissolve Black with Sound**	Producer countdowns to the end of the show TD dissolves black and A kills the music
All Done. Thank you!	Director thanks the crew

Appendix 3.

EXAMPLE OF TALENT RELEASE FORM

Release Form

Without remuneration of any kind, I being competent and of legal age, hereby give *(company name)* the absolute and irrevocable right and permission, with respect to my likeness, performance, and participation in its Video/Web Banners and Photography communications; hereinafter called the "*(Campaign name)"*:

a) To record/photograph my likeness, performance and participation;
b) To copyright the same in its own name or in any other name which it may choose;
c) To telecast the Communications of the recording thereof one or more times over any Internet site, station or stations, or to publicize the Communications or any portion thereof by any means, for any purpose whatsoever in whole or in part, including (but not by way of limitation), promotion, advertising, trade; and
d) To use my name in connection therewith if it so chooses.

I acknowledge that *(company name)*, is and will be the sole owner of all rights in and to the Communications and the recording/photography thereof, for all purposes in perpetuity. I hereby assign any copyright rights, publicity rights or any other rights that I may have regarding the Communications to *(company name)* I also hereby release *(company name)*, from any and all claims of any nature whatsoever which I could or might have against the Releases by reason of any fact or matter whatsoever.

By signing my name, I acknowledge that I have carefully read and understand this document.

Project: Date: _____

Print Name: _____ Telephone: _____

Address: _____

_____ _____

Signature of Participant Signature of Witness

_____

Name of Witness

Appendix 4.

PRODUCTION BUDGET

CLIENT: _____
PROJECT TITLE: _____
DATE OF THE BUDGET: _____
SPECIFICATIONS: _____

NOTE: *This estimate is subject to producer's review of the final shooting script.*

SUMMARY OF COST	ESTIMATE	ACTUAL
PREPRODUCTION		
Personnel		
Equipment and Facilities		
Script		
SUBTOTAL		
PRODUCTION		
Personnel		
Equipment		
Facilities		
Talent		
Art (Set and Graphics)		
Makeup		
Music		
SUBTOTAL		
POSTPRODUCTION		
Personnel		
Facilities		
Recording Media		
SUBTOTAL		
MISCELLANEOUS		
Insurance		
Public Transportation		
Parking		
Shipping/courier		
Wrap Expenses		
Security		
Catering		
SUBTOTAL		
CONTINGENCY (20%)		
TAX		
GRAND TOTAL		

Appendix 5.

STORYBOARD

Showcase: television advertisement of Doctor Pepper beverage, done by me for only demonstrating the layout and general look of the storyboard. The story is artificial and is not related to Dr Pepper, Inc. publicity and promotions.

1

V: DISSOLVE FROM WHITE

A: ENERGETIC MUSIC SNEAKS UNDER

2

V: DISSOLVE TO A BOY

A: Why Doctor Pepper?

3

V: PAN RIGHT TO A WOMAN

A: Because It has unique taste,..

4

V: PAN RIGHT TO AN OLD MAN

A: ...and it is so good to feel the cold can of Dr Pepper in your hands.

5

V: PAN RIGHT TO A YOUNG WOMAN

A: There is only 150 calories and 0% of fat...

6

V: PAN RIGHT TO A GIRL

A: ...and everybody likes Dr Pepper.

7

V: ZOOM OUT

A: There is Fun Where Dr Pepper Is.

8

V: DISSOLVE TO THE LOGO

MRWA PROJECT PROPOSAL

Proposal pages: 7.

Presented to Muskegon River Watershed Assembly February 2011
Ferris State University Storm Water Protection Project
Project Proposal

Statement of Instructional Problem

Storm water runs down the FSU Campus hills and carries contaminants and sediment to the Muskegon River. Eighty percent of FSU's storm water drains to the Ives Avenue drain, and then flows a quarter mile into the Muskegon River. During storm events, the high flow of water is also causing erosion along the drain. This project is developed to reduce storm water runoff. The MRWA wants to create environment-friendly practices and show how cisterns and rain gardens can reduce storm water runoff for better environmental protection.

The video created by instructional designers will be used as teaching and advertising tool, and produced to inform and educate the public about environmental issues including how to build a cistern and a rain garden.

Overview of Document

The final product will feature photos, video, text, and narration to guide learners to get involved in the "preservation, protection, restoration, and sustainable use of the Muskegon River, the land it drains, and the life it supports, through educational, scientific and conservation initiatives".

The video with divided content will be delivered on DVD and prepared for the publishing online so that customers can get this information anytime, anywhere.

Project Definition

Goals

MRWA/FSU Storm Water Protection Project will inspire FSU students to learn about environmental sustainability and ecosystems, and contribute to the improvement of the environment. Client wants to accomplish surveying campus for storm water areas of concern and create a map, research campus soil types. Also the client wants students to develop lesson plans on rain gardens, collect native plant seed to propagate, and complete projects on storm water.

This project is aimed at educating adults and children of all ages about water quality, how storm water affects water quality, and ways to improve water quality. This campaign is thorough and includes fundraising, media relations, and special events planning and implementation.

This proposal explains our understanding of the project, our proposed set of deliverables, and our estimates. The final section presents our qualifications including brief biographies of our production team.

The video features a step-by-step guide and demonstrates a cistern installation process, explaining why it is necessary and the ways to use the collected water. The video must launch effortlessly, and it must be easy and intuitive to navigate. A variety of media, including photos, text, and graphics, will explain stages, issues and their solutions, and show the process how the project was implemented on FSU Campus using clear images and direct language.

Audience

The project will involve Ferris State University students, faculty and staff, and the local community.

Product description

The video will be mainly presented for arranged meetings and presentations to groups for promotional, advertising and educational proposes. The video will be played back mostly in PC environment or on DVD-players, on big screens, so we want to make the product with high resolution and different playback systems compatible.
We propose High Definition video footage with interviews of people of the City of Big Rapids, biologists, and people already involved to the project who understand the idea why it is important. Clear and instructional graphics will be provided as well as suitable sound background. All content will be stored on the DVD disk with easy-to-use navigation. Also client will receive a data disk with prepared content for uploading on the website. In addition to media, the client will get a package of documentation of instructional design's development.

Subject Matter Experts

We are not experts on cistern installation, rain garden planting and the idea of storing of rain water, so will work with The Muskegon River Watershed Assembly's and FSU Storm Water Protection Project's subject matter experts (SME) and documentation materials to design the video. The SME contributes the specific content we need to produce the video in an appropriate manner, and serves as an expert reviewer for each stage of the production process. The contact information of our SME is:

Terry Stilson
1009 Campus Drive, JOH 303
Big Rapids, MI 49307-2280
(231)591-2324
mrwa@ferris.edu

Production process and Deliverables

The process we will use to develop instructional video follows. It is designed to make efficient and effective use of everyone's time and resources.

At the kick-off meeting, our team will meet the MRWA's representatives to introduce each other and to review the objectives for the program. We'll review the production process, the schedule, the deliverables, and process. Since we define the main aspects of the menu and the areas the client want to be shot, we will design the details. Our team will share our own ideas how to improve and make content more efficient for learners to approve or make corrections by client.
The client wants material about the historical background of the river (stream) on campus. So we will be able to spend time doing research.
The first task is to prepare a set of design documents that are equivalent to drafting blueprints – they provide the specific directions for building the video. These documents are the content document (every item that must be included in the video), technical specifications (the delivery platform requirements, the development tools, the user requirements), storyboards (specifications for what will be presented on each screen including text, graphics, video, and audio). We will provide the reviewers with copies of each of these deliverables along with specific directions for providing us with corrective feedback. We will incorporate the changes the client requests and return the completed deliverables to the MRWA.

- Deliverable: Content document, technical specifications, storyboards.

The storyboards contain several components. The text that will appear on-screen will be written in the storyboards. It will be copyedited to make sure it is grammatically correct and also that it flows well between screens and reads well on any given screen. The storyboards also contain the script for narration. Specific images that are needed to demonstrate the process are also identified in the storyboard. The list of these images comprises the shot list for video production.

- Deliverable: Copyedited text, narration script, shot list.

As part of the pre-production process we will produce design comps (actual graphics that look like the real video's static image); a sample tape of voice talent we propose using for narration; a list of the specific media assets we will need to produce or acquire; and a production plan for location work.

- Deliverable: Design comps, sample talent tape, media assets list, production plan, wireframes.

We anticipate that we can complete video production work on location on the Ferris State University's campus, City of Big Rapids and Muskegon River watershed.

- Deliverable: Raw footage.

After the work on location, we will edit the video. We'll also record, edit the audio; produce the graphics including the interface and production art for individual screens; and scan and size any existing photos or images that need to be included. These media files (text, audio, video, and graphics) will be loaded into the shell – the process of putting all the pieces together.

- Deliverable: All digitized media files.

  Once the design comps and storyboards are completed, we'll start building the overarching architecture, or shell, for the video and producing the screens –this is the prototype. It gives the client an opportunity to see how the video, sound and graphics look and work together. The prototype version of the video contains all of the content and functionality, though it won't yet have been tweaked for performance. After the MRWA reviews the prototype and provides revision requirements, we'll make those changes before burning the final product.

- Deliverable: Prototype

  The deployed or final version will be transcoded to MPEG-2 for burning on DVD, and to MPEG-4 file, which will be added to the html-code for publishing online. In addition to delivering the video files, we will also deliver all source files to the client.

- Deliverable: final DVD, web adopted version and all support materials.

  We recognize that the client has other responsibilities in addition to this project and we want to make the most effective use of everyone's limited time. We can provide most materials via email and BP Works space, and the MRWA can provide specific feedback to us the same way. This works quite well in most cases. Design documents and text in general is easy to manage through email and client's comments can be recorded using email and BP Works space as well. In addition to any planned meetings, we are glad to meet extra times and attend any MRWA's events for shooting support material for the project. We will send review materials a day or so ahead of time (or whatever timeframe you require) to give reviewers a chance to examine the material before conferencing to discuss it.

Production Estimates Budget and Schedule

Schedule

This schedule is based on our understanding of the project requirements. It assumes that we'll receive content in a timely manner and that client will be available at key phases. Please note that this preliminary schedule will be developed into a detailed schedule at project start.

Kick-off	Feb. 8 2011
Script & Asset List	Mar. 3 2011
Final Script	before Mar. 24 2011
Shooting	Feb. 15 – Mar. 24 2011
Present Prototype	Apr. 12 (Reshooting if needed)
Final Product Presentation	Apr. 26 2011

Budget

This proposed budget is based on producing the deliverables outlined above. Each of the phases below corresponds to the tasks and deliverables described in this proposal.

Table 1 *Budget*

Item	price per 1	Quantity	Price
Mini DV Tape	$4.00	3	$12.00
Hard Drive Disk 1 Tb	$100.00	1	$100.00
Gas Expenses			$50.00
DVD disk	$1.50	25	$37.50
Paper for documentation			$5.00
Printing	$0.10	200	$20.00
File Folder	$5.00	1	$5.00
Phone conversations	$0.20	100	$20.00
	Total:		$249.50

Notes to budget items:

1. We would be happy to discuss changes to the scope of the project if you need to adjust the budget.
2. Media production includes all video, audio, and content graphics production.
3. Programming included building the functionality and loading all of the content intothe shell.
4. The AT&T wireless contract charges me 20 ¢ per each minute, I talk.

What's not included here:

1. Equipment used: cameras, lightning kit, photo cameras, etc.
2. Licensed software for video editing, computer generated graphics, DVD-creating and burning equipment and software, etc.
3. Instructional Design
4. Deliverables
5. Media production, programming
6. *Quality assurance*

Payment schedule

At the outset of the project, we will work with the Muskegon River Watershed Assembly to produce a document agreeing to all project schedule and deliverables. Payments will be based on achieving these mutually agreed-upon dates and deliverables. We would then notify the client when we need funds ahead of time.

Our team will:

- Produce the final product within the deadlines we've specified.
- Provide full and complete project status information on a regular and on-going basis.
- Maintain the security of project files and confidentiality of MRWA's plans and intellectual property.
- Notify you immediately of any issue that could threaten the schedule or budget.

The MRWA and our team will:

- At the outset, the MRWA SME-person(s) will produce comprehensive functional and production specifications.

- Develop a workable review process and schedule prior to beginning development.
- Agree on a payment plan based on milestones.

The MRWA will provide:

- Clear objectives and expectations for product.
- Timely delivery of all content, materials, and information.
- Source content materials.
- Media or other files as required.
- Technical requirements and files as required.
- Access to subject matter experts and reviewers
- Timely reviews.
- A designated liaison or reviewer with final sign off authorization in cases of conflicting requests.
- Clear sign-off process for each deliverable phase.

Assumptions and Risks

Risks to completion

This project is on a quite tight timeframe. We want to ensure that we are all aligned in working as an effective team in order to adhere to the project's deadlines. The greatest risks to timely completion of a project are due *to delays in receiving the content, delays in receiving review comments, or conflicting review requests*. Our schedule and budget are based on adhering to timelines so that both our team and the MRWA can work efficiently and effectively.

To ensure against problems that could adversely impact these estimates, we recommend that all key reviewers and anyone with ultimate sign-off attend the kick-off meeting. *Having access to these key people* early in the project saves time for everyone in the long term.

It is also critical that a single person be identified as having final approval over specific deliverables to prevent consensus issues from slowing the work. We will notify your liaison immediately if anything jeopardizes the budget or schedule so that we can agree, together, on the appropriate action.

The *weather* conditions are also unpredictable. We would like to reserve some time of shooting in case of bad weather.

We recognize that instructional design development is an intrinsically creative and iterative process. To that end, our team builds-in one complete review and revision cycle for each deliverable phase. Changes made to the project after a deliverable phase (such as changing the look after the look has been approved, or changing content after storyboards have been approved) are *considered out-of-scope changes*. We work to minimize these changes by communicating fully and frequently, providing clear directions and explanations of the process throughout the production cycle, and by giving reviewers a heads-up prior to delivery of each phase. We know that some errors will escape the best efforts at detection and that some changes may be required. We will immediately contact the MRWA if we find there are revisions that cannot be handled within the scope.

Qualifications

Our goal is to develop good relationships with the client, so providing on-going services, such as modifications, is a key service in maintaining those relationships. We would not begin the work without authorization from the client. Team overview:

Evgenia Molchina

- International project manager from Finland/Russia.
- Has experience of working with different useful for this production software.