Agile Virtual Content Creation

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2019 Laurea
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Business Information Technology
Bachelor's Thesis
January, 2019
The purpose of this thesis project was to find a flexible, usable and efficient way to create virtual course content for the Media Elements course of Laurea University of Applied Sciences. The objective was to start the creation process for a virtual implementation. The course had previously been merely based on contact sessions.

The development tasks were to research and test the best suitable and agile method for virtual content creation. The tasks were to create the first virtual course content prototypes such as video tutorials and a suitable platform for them. The images used in the tutorials were taken by the development team itself and screen captures used were purely for educational purposes.

The knowledge base was gathered by comparing (benchmarking) virtual courses that have been found successful, by researching market leading professionals in the virtual content creation field and benchmarking available tools and environments. Previous expertise on Adobe products, Scrum sprint method and other related skills were utilized and improved in the process. Collected user interviews also gave additional information.

The development method used in this project was the Scrum framework. The Scrum sprint process began by interviewing users about their earlier user experience on virtual study content (user stories). The first prototype was tested by observing the users while they were testing the video tutorial and collecting feedback (empirical interviews). The first tutorial prototype was tested with the users and the task was to stream online using the tutorial instructions. The time to complete the task was measured and limited to thirty minutes (quantitative measurements) and feedback for the improvements was collected (qualitative measurements).

The first outcome of this project was the creation of YouTube brand account “MediaElementsVirtual” for the Media Elements course. Additionally, the channel structure was built to adapt in the structure of the future learning platform. Image content was taken by the development team itself for video tutorial creation, creating a manual tutorial for creating virtual content with the chosen tools and method and testing the usability of the video prototype collecting user feedback.

Based on the test results and feedback on the video tutorial prototype, the results obtained were encouraging. They confirmed that the methods and tools used in the tutorials were functional and user-friendly in order to get high-quality results. The outcomes can also be used in following iterations for improvements and further virtual content creation.

Keywords: virtual, tutorial, multimedia, content creation, sprint
Table of Contents

1 Introduction ................................................................................................................. 6
2 Development method Scrum .......................................................................................... 6
   2.1 Agile Manifesto ........................................................................................................ 6
      2.1.1 Values ............................................................................................................ 7
      2.1.2 Principles ........................................................................................................ 7
   2.2 80/20 rule (Pareto Principle) .................................................................................. 7
   2.3 Creating Team Culture of Positivity ....................................................................... 8
   2.4 Scrum team ............................................................................................................ 8
      2.4.1 Product Owner ............................................................................................... 8
      2.4.2 Scrum Master .............................................................................................. 8
      2.4.3 Development Team ..................................................................................... 9
   2.5 Sprint phases .......................................................................................................... 9
      2.5.1 Map ................................................................................................................ 9
      2.5.2 Sketch ........................................................................................................... 9
      2.5.3 Decide ........................................................................................................... 10
      2.5.4 Prototype .................................................................................................... 10
      2.5.5 Test ............................................................................................................... 10
3 Research ...................................................................................................................... 10
   3.1 The starting point of Media Elements course ......................................................... 10
   3.2 End-User interviews: User stories .......................................................................... 11
   3.3 Benchmarking interviews and sound testing ......................................................... 11
   3.4 Web Platforms ...................................................................................................... 12
      3.4.1 Laurea University of Applied Sciences learning platform ............................ 13
      3.4.2 Lynda.com (LinkedIn Learning) .................................................................. 13
      3.4.3 YouTube .................................................................................................... 13
   3.5 Software ................................................................................................................ 15
      3.5.1 Adobe Photoshop software .......................................................................... 15
      3.5.2 Adobe Audition software ........................................................................... 16
      3.5.3 Adobe Premiere Rush software .................................................................... 17
      3.5.4 OBS Studio software .................................................................................. 17
4 Development .............................................................................................................. 18
   4.1 Photo shoot session ............................................................................................... 18
      4.1.1 Technical requirements of the course ......................................................... 18
      4.1.2 Image quality ............................................................................................... 19
   4.2 Making of video tutorials ...................................................................................... 19
      4.2.1 Technical requirements of tutorial making ................................................. 20
4.2.2 Creating MediaElementsVirtual YouTube brand account ...................... 21
4.2.3 Optimizing efficiency in tutorial video production .......................... 21
4.3 Testing ................................................................................................ 22
  4.3.1 Usability heuristics ..................................................................... 22
  4.3.2 Empirical Interviews .................................................................... 23
5 Results ........................................................................................................ 24
6 Conclusions .................................................................................................. 24
References ......................................................................................................... 25
1 Introduction

In the world we currently live in, the constantly updating software, new platforms and rapid changes in the field of information technology, it is a true challenge to create current and superior quality virtual course content. How to build agile, user friendly online video tutorials to support virtual course learning?

The thesis project searches for an answer to the question mentioned above and hopefully encourages the customer to start the next virtual course content creation process (iteration) with the help of the results and created content within the timebox of this thesis project.

2 Development method Scrum

Considering the challenges of the virtual course creation process and the several times a year updating software that the study content of the Laurea Media Elements course is based on, the development method used in the process must be very responsive and adaptable to changes, which are some of the strengths of the Scrum development method. Another thing to consider is the study environment, in this case the Laurea University of Applied Sciences, guidelines and methods.

Säilynoja (2016) points out that the development method Scrum is based on learning by experience. Laurea (2018) is using a similar pedagogical approach in their courses called Learning by Developing (LbD). Problem analysis paired up with solution seeking are the building blocks of the LbD content method.

The building of the Media Elements virtual course content creation process is starting from nothing and it is essential to start by seeking the right working methods, platforms and tools. Rose (2018) enlightens that Scrum is an empirical, agile mindset-based framework designed for all kinds of processes to deliver products or services and it enables to break up massive projects into smaller short pieces called sprints.

2.1 Agile Manifesto

The roots of the Scrum development method lie in the mindset of agility. Rose (2018) educates that the agile mindset is an alternative approach to an old school bureaucratic working culture, originally designed to respond to a fast-changing software development industry that was in a desperate need of a more flexible, see-through working environment. He adds, that in the agile mindset, each team member has just enough of skills from all aspects of the work in process that they are both able to learn from and teach one another and through fluent communication every-one involved stays up-to-date in the process.
2.1.1 Values

According to Rose (2018), Scrum is the most popular Agile framework up to this day. He explains, that Scrum is based on the four values and twelve principles of the Agile Manifesto.

Rose (2018) says that the values Scrum has adapted are to trust people and interaction instead of processes and tools by encouraging daily meet-up scrums of 15 minutes and face-to-face meetings of 45 minutes. He says, that Scrum counts on open communication rather than piles of documentation. He then continues, that Scrum avoids multi-tasking and focuses fully one step at a time on building a working product based on user stories and customer priorities and finally testing the product to ensure value for customer at the end of each sprint.

Rose (2018) says that Scrum values supporting a see-through customer collaboration where the customer will see the first usable prototype fast instead of long contract negotiations. He mentions, that instead of making a long-term plan that will be followed punctually, Scrum method is used for short-term plans that are quick to respond to changes even at a late stage of the development process.

2.1.2 Principles

In addition to values, there are twelve agile principles in the manifesto. Rose (2018) briefs up that these principles are guidelines for the steps to follow in an agile work process.

Rose (2018) explains that principles one, eight, nine and ten talk about prioritizing the work, principle two talks about welcoming changes, principles three and seven are about continuously delivering products in short iterations while principle four talks about developers and clients co-working. He continues, that principles five and eleven emphasize compact, self-organized and motivational team of generalists, principle six is about the importance of the face-to-face meetings and finally principle twelve encourages the team to have a brief up after every sprint to improve their co-working skills in the future.

2.2 80/20 rule (Pareto Principle)

Vilfredo Pareto, an Italian man, discovered the rule of 80/20 while he was gardening peas. Twenty percent of the pea pods were the ones to produce eighty percent of the peas. As an economist he began to research further and started to see the ratio of 80/20 also for example in the wealth distribution of Rome. He discovered, that twenty percent of the population owned eighty percent of the city’s land. The 80/20 rule is known as The Pareto Principle, which is a wonderful reminder to find out which are the twenty percent of the priorities that will deliver the eighty per-cent of the customer value. (Rose 2018.)
2.3 Creating Team Culture of Positivity

Choosing the right team is a key aspect in any collaboration. Rose (2018) guides that there are a few useful games to play when forming a group to build a communication gateway between the team members.

Rose (2018) instructs that The Penny Game starts with setting a timer and the first team member start arranging 10 pennies in a certain order and then passes them on to the next team member and this continues until the last team member has finished assembling the pennies. He continues, that proven by the timer test, the client will get the first glimpse of the product the fastest when each team member arranges first two pennies out of ten and then passes them on to the next even though it will increase the overall time of the team work.

There is a suitable African saying by an unknown author: “If you want to go fast, go alone. If you want to go far, go together.” Sharing work load and making sure everyone has something meaningful to do rather than just waiting around will improve the outcome in the end. Scrum as a method is already embracing the positive and uplifting team building where everyone dares to ask even the tough questions in an openminded environment. Dynamic, encouraging, happy and unified team goes far. (Forbes 2018.)

2.4 Scrum team

Scrum teams only have three roles and the Scrum work process has five stages. Scrum team is a cross-functional team where each team member shares understanding about the product. Scrum team is motivated, self-organized and they are sharing a mutual goal. (Rose 2018.)

Scrum team executes a work loop: plan, analyse, develop, test and deliver. The outcome is what is produced within the sprint timebox. Scrum team makes product refinements in the follow-up sprint based on what they learn about the product in each loop. (Rose 2018.)

2.4.1 Product Owner

Product owner owns the product or service that is being developed. The product owner is representing the end-users of the product. The product owner meets up with the team and guides them on the way. The product owner holds the product backlog, a list of all the important features and functionalities the customers value the most and which can be achievable in a brief period of time. (Rose 2018.)

2.4.2 Scrum Master

Scrum master has the knowledge of the Scrum developing method. Scrum master is the facilitator of the team making sure that everyone understands the work flow. Scrum master is a
sort of a mentor helping the team to follow through the process and eliminating any obstacles that may come in the way of process success. (Rose 2018.)

2.4.3 Development Team

Developers are responsible of producing the process outcome. Developers may have different skills or work backgrounds, but they share a mutual responsibility to deliver the end results of the process. (Säilynoja 2016.)

2.5 Sprint phases

Sprint is a five step Scrum working method designed to gather the right people together and to manifest visualizations in a brief period of time. Rose (2018) clarifies that the typical sprint duration is only a couple of weeks to a couple of months.

Knapp, Zeratsky and Kowitz (2016, 5-6, 15-17) explain that sprint is a learning experience that starts from a specific challenge which needs to be solved and it can be used in diverse processes. They also emphasize, that this rapid prototyping and research method does not only apply to de-signing mass-market products, but this practical way of working can be used by anyone. They continue, that the agility of sprint enables risky ideas to be tested in the early stages of the process the iteration of the sprints enables constant improvement: what has been learned in the previous sprint shall be implemented to the follow-up sprint enhancing the outcome of the process.

2.5.1 Map

The sprint starts with setting the short-term goal and visualizing the outcome of the process. It is important to pick a target that is believed to be achievable in a brief period. Instead of focusing on the problems, they shall be turned into sprint questions. The first draft of a simple process map is being created. Team communication and taking notes is essential. (Knapp et al. 2016, 51, 62, 65, 67.). Instead of focusing on the problems, they shall be turned into sprint questions. The first draft of a simple process map is being created. Team communication and taking notes is essential. (Knapp et al. 2016, 51, 62, 65, 67.)

2.5.2 Sketch

The next step is to start innovating solutions to the sprint questions. The first simple sketch of the solution is drawn on a piece of paper, a lightning demo. Working individually, each member of the team comes up with a strategy for solving a challenge. The sketch process has four limited time phases: notes, ideas, crazy 8s (wild ideas) and solution sketch. The sketches are the fuel of the sprint. (Knapp et al. 2016, 98-100, 107-109.)
2.5.3 Decide

In the middle of the sprint a solution which best achieves the long-term goal shall be chosen. A storyboard is being created of the winning sketches. The effective decision process has five phases: art museum, heat map, speed critique, straw poll and supervote. The decision made is the biggest decision of the sprint. The winning solutions are used to form a storyboard, about 15 panels sheet of pictures to vision the finished prototype. (Knapp et al. 2016, 125, 131, 142, 149, 152.)

2.5.4 Prototype

At this stage of the sprint it is time to build a realistic prototype based on the storyboard. The prototype is not meant to be perfect as a finished product. The purpose of the prototype is to simulate how the finished product could roughly look like. The prototype process has four useful phases: pick the right tools, divide and conquer, stitch it together and do a trial run. At the end of this phase it is time to double-check that the prototype includes everything visualized in the storyboard, revisit the sprint questions and to fix the holes. (Knapp et al. 2016, 163, 169, 183, 189-190.)

2.5.5 Test

The final stage of the sprint is to test the prototype with real customers and to observe them. The Danish user research expert Jakob Nielsen has proven that five diverse target group customers are enough for the testing process. The interview process has five phases: a friendly welcome, context questions about the customer, introduction to the prototype, tasks to get the customer reactions and a quick brief. The results will help to understand how user-friendly the solutions are and how the prototype could be further developed. (Knapp et al. 2016, 193, 197, 202.)

3 Research

In the beginning of the thesis project, the product manager, scrum master and a motivated, self-organized team of generalists, with diverse skills in the field of information technology, visual design, usability and user experience to mention a few, brainstormed the sprint process in a face-to-face meeting. The face-to-face meetings were held often to keep all participants up to date during the process.

3.1 The starting point of Media Elements course

The first stage of the sprint, the mapping was started by looking at what kind of content Laurrea Media Elements course virtual implementation could be containing. The starting point of the whole project was to begin the creation process of building Media Elements course from a completely contact orientated course to contain virtual study content.
The mind-map of the sprint was drawn on the whiteboard and a timebox was created. The developers held daily scrum meetings and face-to-face meetings as often as possible. Team was motivated working towards the common goal throughout the thesis project.

New skills were learned not only by working together as an international team, but also by teaching and learning from each other. The content of a video tutorial was visualized and sketched on a paper sheet. A decision was made to create our own photography to use in the tutorial. The developers spent the entire day photo shooting in the Helsinki City centre to have material to work with.

3.2 End-User interviews: User stories

The End-users were involved in the process from the very beginning by empirical interviews. The target group of five students was chosen to share their user stories. Each of the students either have been taking the Media Elements course, were currently having the course or they were potential future course students.

Nielsen (2000) explains that it is better to test often and with no more or less than with three to five diverse users, because if you test more, the less new results come up. He says, that testing with a large group of people is only a waste of time and resources and the best results are achieved if testing often with a small group.

The students were shown a few videos of benchmarking tutorials made by two Laurea teachers who are successful in creating functional virtual course content. Then the users were asked to answer the in advance prepared questions. The goal was to collect user stories and to research what were the twenty percent high-priority elements to focus on to create the best possible customer value at the end of the process.

The interview data was collected and combined by placing the most frequent topics that came up in most of the interviews. These results were then used in the making of the video tutorial prototype section.

3.3 Benchmarking interviews and sound testing

The developers performed face-to-face interview with the Laurea Digi team leader to figure out what kind of requirements or rules Laurea has for creating virtual content. The preconstructed questions were asked also about the quality and support and equipment Laurea has to offer.

The developers performed face to face interviews for two Laurea teachers leading several successful virtual course implementations. The premeditated questions were asked, and the advice of the teachers was heard. The key findings were summed up and prioritized to again
know where the focus should be for bringing the best possible customer value at the end of the sprint.

The developers also booked Laurea sound studio for testing purposes. A voice recording session was held with the sound studio dual channel condenser stereo microphone. However, the studio recording session turned out to be a time and resources consuming process.

The first challenge in the Laurea sound studio was that the studio microphone needed a memory card to record the audio, but it did not accept the card the developers had brought along. The microphone accepted only the memory card that came with it and luckily the Laurea Digi team cleared up some space so that the testing could continue.

The next challenge was that the studio microphone is extremely sensitive, which caused all the tiny mouse clicks of the Digi team workers up to the large fan above in the tiny sound studio room to be captured. The recorded file size is on the larger side as well.

The recorded sound file could not be used as it was because of the challenges mentioned before, so it had to be edited with Adobe Audition software. That increased the file size and the humming of the fan and other disturbing sounds were so strong that after the edit, the sound quality had suffered quite a bit.

It was also challenging to book an appointment in the sound studio, because the developers did not have access to the reservation system and there were times when the sound studio was booked for the whole week by another project.

The developers alternatively tested the laptop microphone, but the inner laptop hum made it impossible to make a high-quality tutorial video. However, when testing the recording with a Turtle Beach Recon 320 headset the sound quality was found to be much better and easier to edit. Therefore, it was decided to use the headset for the first video tutorial prototype.

3.4 Web Platforms

In the section below are sorted the platforms used in the virtual course implementation process. All platforms have their own purposes but also limiting factors in planning virtual course content like this.

On top of creating learning material, the main weight of focus was on efficiency between these tools. As learning platforms, intra networks as well as editing software rapidly develop forward, it is increasingly important to find quickly adaptive ways to accommodate. In virtual courses like this, it is highly valuable to be able to update or even change instructions and practices in a short timeframe.
3.4.1 Laurea University of Applied Sciences learning platform

The learning environment of Laurea thus far has been Optima. Optima was made to fill its place in the beginning of 2000’s and hasn’t seen too drastic changes after that. In 2018, the benchmarking interview clarified that currently used platform sets some limitations on how to form virtual course content directly to the platform.

Benchmarking for guidelines on how to form Optima workspace was carried out in November 2018. The most important guideline was that it is a good practice to divide bigger subjects as their own folders in a navigation bar on the right side. Every subject folder should be limited to only have three tabs for written information, videos and other content. These guidelines are to keep Optima workspaces uniform and to keep all information easily navigable for students. The only problem in the lifecycle of Optima though has been that not all courses follow the same recommended guidelines. That has led to some incoherencies between workspaces.

The process of choosing and intergrading a new learning platform is currently under consideration in Laurea. Because the uncertainty of future Laurea learning platform, it was decided that it is important to find an alternative platform to quickly adapt and migrate teaching material. The platform chosen has an unlimited video upload possibility and the embedding of the videos into Laurea learning platform is seamless.

3.4.2 Lynda.com (LinkedIn Learning)

Lynda.com, currently also known as LinkedIn Learning, was used as an example to follow for tutorial video making. The website lists down various areas of expertise they have made online course tutorials on and they are all accessible with a single subscription.

In this project Lynda.com was used not only a means to update knowledge on Adobe programs but also to find a working way to categorize and plan how to divide information in Adobe programs into a tutorial form. Furthermore, a major beneficial factor for learners on Lynda.com is its closed captioning option. By turning the option on, it allows the viewer to see spoken words and sounds either as a text track or captions. It is a feature that will be a fantastic addition in tutorial material of the final virtual course project as well. Adding captions on YouTube is easy but implementing a system that highlights a script as it is been read demands more work behind it. (LinkedIn Corporation 2018.)

3.4.3 YouTube

YouTube is a world famous, widely popular virtual content platform. According to YouTube (2018) over 1.9 Billion users in more than 91 countries log in monthly using mobile devices and the site navigation is available in 80 diverse language options.
One of the goals of the sprint was to create content using a platform which is easily accessible with various devices everywhere, any time and that is free to use. The benchmarking interviews resulted that YouTube channels are favoured as a learning content platform also in Laurea. The customary practice is to download video content to YouTube and link it to Laurea learning platform or sharing the link with the students.

Benchmarking other available platform options, it was clear that the most reliable, accessible, time and resource saving platform for the Media Elements Course virtual content is YouTube. Therefore, it was chosen as the primary platform for this sprint to upload content.

YouTube brand account enables working on the channel with multiple channel managers. To create a YouTube brand channel, the first step is to set up a Google account, because YouTube is a service owned by Google and the most features are available when using Google’s Chrome web browser. With the same Google username and password, the next step is to log in to YouTube where the brand account will be created. To be able to upload videos longer than 15 minutes and to stream live, the channel must be verified with a phone number. YouTube provides more options as the channel grows. Creating the channel art and channel icon early on gives the channel a more professional look. Updating the channel info by setting the most important tags and key-words first will help with the search engines to direct the target group flow into the channel. (Harrington 2018.)

Uploading video content to YouTube can be done by choosing a file from the computer or streaming live. YouTube will automatically create responsive formats of the video for each device and screen option, but to be able to create the highest quality videos, the original uploaded file must also be high quality. Even though YouTube supports multiple file formats, the best results will be achieved with popular, optimized and high-quality MPEG4, MP4 or h.265 (next generation MPEG4) file format. The video can be edited in YouTube Studio after it has been uploaded to YouTube. For example, it is possible to add auto-generated subtitles, manually typed subtitles or allow the community to add other language subtitles to the video. It is also possible to do some basic trimming of the video and to add background music from YouTube Studios royalty free music collection. Video visibility can be set to public, unlisted (hidden) or private (password protected). Additional information, tags and settings can be edited even before the video is has finished uploading. The URL to share the video is found in the video details section. Video content can also be arranged into sections and playlists on the channel. (Harrington 2018.)

Live streaming videos will be automatically uploaded to YouTube and it is not necessary to save a copy of the video on a computer or separate cloud service because the uploaded videos can be downloaded from YouTube Studio videos section if needed. This option is handy in
case the video requires more than basic editing options that YouTube has to offer now. In any
case, streaming videos straight to YouTube will save a lot of time and resources.

3.5 Software

In the section below is listed software that was used when making this virtual implementa-
tion. It includes Adobe software that were in the centre of this project and Open Broadcaster
software that was used as the main screen capture utility.

3.5.1 Adobe Photoshop software

Adobe Photoshop software is the best of the world when it comes down to image enhancing
and graphic designing. The software is widely popular and used by multiple companies in the
field of visual design. The biggest advantages are its intuitive tools, such as content-aware
tool for removing objects from an image, which help even a beginner level designer to
achieve visually satisfying results. Adobe also provides easy to follow tutorials on their web-
site and Adobe products keep updating frequently for better user experience. (Adobe 2019b.)

Adobe Photoshop software is one of the Adobe Creative Cloud products that is being taught in
Media Elements course. The assignments are beginner level, so therefore the Adobe Photo-
shop software tutorial made during the sprint is also made for beginners. Adobe Photoshop
software 2019 update includes even better intuitive tools.

From a professional point of view, when working with images, the goal is to maintain as much
original image (raw image) information as possible for the highest quality outcome. Raw im-
age can be easily opened through Adobe Bridge software, a visual media library, by double
clicking the raw file. This opens a box for camera raw image editing, which is not damaging
the original file and the changes made with the technology can be reset at any time. Opening
the file in Adobe Photoshop software as lossless as possible, holding down the shift key and
clicking “open object” in Camera Raw window will open a copy of the raw file as a smart ob-
ject in Adobe Photoshop software. By changing the image mode from 8-bit colour depth to 16-
bit colour depth will expand the image RGB colours to trillions of colours which means the im-
age will not suffer from editing as much loss as the lower bitrate image would. There is also a
possibility to use the 32-bit colour depth, but the file size increases and a human eye is only
capable of receiving a certain number of colours, so it is not necessary in most cases. In fur-
ther image manipulation, smart filters and adjustment layers should be used to keep the non-
destructive working mode because instead of making permanent changes to the image they
will create another layer like a coating in front of the original image which can be removed at
any time and the original image stays untouched. (Kost 2018.)

Content awareness means that if for example there is a field of flowers in the image and in
the field, there is a piece of trash that will be removed from the image, Adobe Photoshop
software uses intuitive content aware fill with colour adaptation to replace the trash with the beautiful flower field around it. This magically easy to use feature also intuitively replaces blank areas when crop-ping an image. Objects can also be moved with a content aware move tool, so they will blend in to the spot they were moved in. Content aware scale allows to protect an object selected in the image, for example a house, from scaling down when scaling the image keeping the object pro-portions untouched. (Kost 2018.)

In the planning of virtual course tutorial video content, it was decided to teach foremost these advanced features along with the needed tools and actions required to perform the tasks. With the most current knowledge and skills of using the newest tools, the students will have a competitive advantage in the labour market, since Adobe Photoshop software is a market leading product.

3.5.2 Adobe Audition software

Adobe Audition software is the best of the world when it comes down to digital audio editing. There are two options to work with: destructive (waveform) and non-destructive (multitrack) mode. Sometimes there might be a clicking sound or other sounds in the original file which are desired to be completely removed even from the original file. Recording, editing and using the professional level essential sound panel to achieve high-quality audio truly makes Adobe Audition the best of the industry. (Adobe 2019a.)

Adobe Audition software not only helps to repair audio, but with the multitrack feature it is possible to build an entire world of sounds by mixing sound effects, background ambience, music and vocals. One of its advanced features is the ability to match clip loudness simultaneously on multiple chosen sound tracks. There is also an auto-ducking feature, which means that the music will automatically quiet down when there is speech. The coolest features are the possibilities to stretch a song to match the whole sound track length or to remix a song to be shorter if the track is other vice shorter than the music clip. There are also other effects such as fading to create smooth transitions. One of the most common problems, a humming sound cause by ventilators in the computer or a room can also be fixed with a DE hummer feature. Any other unwanted sound can also be removed taking noise prints and the intuitive filters recognize which sound model should be removed without removing other essential sounds. In the essential sound panel there are pre-sets and by using them to boost voice, music or effects will give the sound file a truly professional touch. Multitrack sessions can be exported directly to Adobe Media Encoder where they can be transformed into a desired file format such as high quality MP4 format. (Murphy 2018.)

Even though Adobe Audition software is not among the Adobe products taught in Media Elements course, the user stories indicated that a clear audio is important when making the virtual course tutorials. Therefore, Adobe Audition software was used in the process to make
sure that the sound quality is as high as possible, and the listening experience is clear, understandable and audible.

### 3.5.3 Adobe Premiere Rush software

Adobe Premiere Rush software application has a built-in camera function on mobile phone for recording quick professional quality videos that can be synchronized on all devices for further processing or they can also be edited in the application and then directly shared to YouTube. Other vice all devices share the same editing options. Some of the basic options are the possibility to add any image or video to the project by pressing the round, blue plus icon. The most useful options are to re-arrange the content, trimming, splitting longer ones in parts, adding fade transitions, colour and built-in titles and effects. It is also possible to record a voiceover by clicking a track microphone image or choosing the option from the round, blue plus button. It is also possible to add a soundtrack from the Adobe Premiere Rush software soundtracks folder or any other soundtrack of choice by clicking a round, blue plus button. Sounds can be edited in the audio panel where for example the sound loudness can be adjusted as well as enhancing voice, reducing echo and reducing background noise. The finished project can be directly downloaded on a local computer and it can be shared directly to YouTube by signing in the YouTube account in Adobe Premiere Rush software. (Harmer 2018.)

Adobe Premiere Rush software is not one of the Adobe products taught in the Media Elements course, but it is a wonderful tool to save time and resources when creating virtual content. That is why it was used in editing and building the video tutorial prototype as well. The video and audio tools are advanced, but designed for someone in a rush, so all the key functions for creating content for social media has been assembled into one software. When editing a voiceover recorded with a computer laptop integrated microphone, the background reducing tool will eliminate the hum. The sound quality that can be achieved with Adobe Premiere Rush may not be as advanced as editing with Adobe Audition software, but it is much faster to work with and the sound is audible.

### 3.5.4 OBS Studio software

OBS Studio software is available for Mac, Linux and Windows for free. It is an open source software that can be used to live stream professionally produced content to YouTube. With OBS Studio it is possible to create limitless number of scenes for example for lecture slides and screen capture with text, audio and video. In the studio mode it is easy to manage and switch between the scenes using professional transitions. (Open Broadcaster Software 2019.)

There is a possibility to also record a copy of the live stream on your personal computer in high-quality mp4 format. Another possibility is to just stream straight to YouTube and YouTube will automatically save the video in the YouTube channel archive where the video can be edited or downloaded to a computer for further editing. Streaming to YouTube is
simple: just copying the stream key from YouTube and inserting it into OBS Studio stream settings will do the trick and the streaming is ready set.

OBS Studio was chosen for the virtual course content creation process because of its ability to save time and resources. Also, the professional yet easy to use interface with a lot of diverse visual effects and high-quality video production helped to make the decision. When benchmarking other free video production services, OBS seemed to be the best choice for the needs of the virtual course content creation process.

4 Development

The development phase of the thesis project followed the chosen Scrum method, was built on YouTube platform and created with software introduced in the previous chapters. This chapter is a deeper review of the tools and techniques used in the development process.

4.1 Photo shoot session

Goal for the virtual course implementation was to use as much of self-created material as possible. For the Adobe Photoshop software tutorial, it was decided to gather material by arranging a photo shoot session in Helsinki. The idea was to create RAW images for editing and using them as a part of Adobe Photoshop software tutorial content. The main photo shoot object was Helsinki Cathedral. Images could be used not only for the first image editing tutorial but also in further assignment tutorials such as using Helsinki Cathedral as an image background and then combining two images by adding another object, a seagull, in the image with the help of Adobe Photoshop software tools.

Keeping the following assignment tutorials in mind while taking the pictures, it was considered that the perspectives of the objects should be suitable for combining the images. The aim was also to avoid many miscellaneous extra objects in the image such as people walking by in the background because the less editing an image requires, the more of the original image quality will be maintained.

The project background image was lined up and shot using a Sony A7 mirrorless camera on a tripod. Photo of the seagull was shot using a Canon EOS 600D handheld device.

4.1.1 Technical requirements of the course

Technical requirements for this project can be divided into two sections that define what methods to use. First, the level of quality in materials provided for the course, and second, the level of quality needed for the tutorial projects. Contents were created using the latest 2019 versions of Adobe products.
As for course material quality, only systems camera grade images were used. More specifically, systems cameras used were Sony Alpha 7 with Sony FE 28-70mm F/3.5-5.6 OSS lens and Canon EOS 600D with Canon 18-55mm f/3.5-5.6 IS II lens. The two most crucial factors that needed to be fulfilled were that editable files are in camera RAW format and that image resolution is high enough. Sony Alpha 7 is capable of shooting 24.30 megapixels and Canon 600D 18 megapixels, which meet the requirements very well.

4.1.2 Image quality

As mentioned above, the use of RAW images in tutorials is vital to show all possibilities with image editing. On top of that it also allows higher image quality than compressed image file types like JPEG. Additionally, higher brightness levels can be captured in RAW because it uses a higher bit depth: 12-bit or 14-bit, compared to that of JPEG’s: 8-bit. It is knowledge that is utilized in the produced tutorials as well and for the highest image quality possible the images should always be edited in Adobe Photoshop software in 16-bit depth to be able to utilize the whole colour spectrum of the images.

By using RAW file format in photography, the photographer ensures that exposure and white balance can be easily corrected with only slight quality wear-down. A RAW file has information that compressed file formats do not have, so they enable editing in such way that is close to changing camera settings in a photo shoot. (Lim 2011.)

4.2 Making of video tutorials

Before starting to make tutorial content, it first had to be made clear what are the elements that build up a good tutorial video. By using the results of the user stories and benchmarking, it was found out that an easily understandable video tutorial has a clear sound and a high video quality.

It was also important for the tutorial to follow a pace that is suitable to the level of learners it is targeted for. Additionally, one of the key findings was that including keyboard shortcuts in information boxes in the tutorial videos is highly valued. It was also pointed out that both Windows and Mac OS X keyboard shortcuts should be covered.

The first tutorial prototype made by the developers was a manual video for the target group on how to create content with the chosen effective methods used in this thesis project. The tutorial was made exactly as shown in the tutorial video content, live streaming to YouTube with OBS Studio. The video was edited in Adobe Premiere Rush software and the audio was edited in Adobe Audition Software. The first tutorial prototype “YouTube Live Screencasting Using OBS Studio Software” is open for public and it can be found by searching for the MediaElementsVirtual channel on YouTube.
When making of the study content tutorial, Lynda.com was used as an example baseline of coherency when starting to plan out tutorials. The creation of video tutorials started off by first creating a script.

In Adobe Photoshop software’s case the first tutorial prototype includes information on RAW file format and the assignment is to learn how to open RAW image in Adobe Photoshop software as lossless as possible as a smart object via Adobe Camera Raw plug-in. Keyboard shortcuts were added to the tutorial as well. Further Adobe Photoshop software tutorial scripts made were about basic image editing and detaching and adding objects which can be used to create the next prototypes in the following iteration. (Creative Bloq 2013.)

4.2.1 Technical requirements of tutorial making

As covered before, one of the most important technical requirements for video tutorial usability are video and sound quality. Open Broadcaster Software allows video captures of up to 1080p which is enough for this course’s purposes.

In tutorial making, audio quality gets in an elevated position of importance. An external microphone is recommended as built-in microphones in computers induce a lot of unwanted humming noise. Big proprietary microphones, albeit a dynamic, condenser or ribbon microphone, would be the best options for video production. (Briones 2015.)

Some of the best microphone brands in the market today could be Sennheiser, AKG, Shure and Audio-Technical but finding a proper microphone is up to the project being made. In the case of making the video tutorials for the thesis project, it was found out that studio quality microphones may be too receptive to surround sounds and therefore need a lot of advanced sound editing afterwards. The quickest way for a satisfying and audible results with minimum audio editing was made with an affordable headset.

In the making of the video tutorials, a gaming headset by Turtle Beach was used. Gaming headsets are widely used by their most apparent userbase, gaming streamers, who also need clear audio quality for gaming commentaries. The nature of gaming commentaries is similar compared to that of tutorials as in both detailed mechanics, instructions and comments can be given. Therefore, using a gaming headset that was already accessible, since the budget for the project relied on most parts on students’ innovative resources, turned out to be a success in this project.

Some other requirements that need to be met while making these tutorials are requirements around PC performance. Capturing and editing video material can be demanding on resources. Below are listed some of the various aspects to keep in mind.
Videos recorded with OBS Studio software can require a lot of disk space when recording to a local computer at 1080p. If possible, it is recommended to have a separate hard drive for recording than where the user’s operating system is located. That is to avoid high data transfer stress towards only one hard drive. Also, using cloud services instead of recording to a local computer and storing videos to YouTube directly instead will save a lot of space.

When editing recorded clips, it is good to remember that some editing software such as Adobe Premiere Pro is a resource intensive piece of software. Most notably, it requires a lot from processor, graphics card and the recommended amount of computers RAM (random-access memory) is 16 gigabytes. (Adobe 2018.)

4.2.2 Creating MediaElementsVirtual YouTube brand account

An account set up for the Media Elements course by the developers is called MediaElementsVirtual. According to Google (2018), YouTube’s brand account allows organization members to use one account collectively. The content was divided into content folders that mimic the content order concepted for the Media Elements course virtual implementation.

The channel content folders were divided into different subjects such as Adobe Photoshop, Adobe Illustrator and Adobe InDesign, which are some of the Adobe products taught in Media Elements course. Further playlist folders can be formed as desired. Content from these folders can also be easily embedded into other platforms.

4.2.3 Optimizing efficiency in tutorial video production

During this project two ways of making videos were used. They both involved using Open Broadcaster Software as a means of capturing video but differ in ways of whether the produced capture is streamed straight on YouTube without editing or saved on a hard drive. The latter tutorial was edited in Adobe Premiere Pro software, rendered and only then uploaded to YouTube.

It will depend on the complexity of the subject which way to proceed is best for the tutorial. In many situations it is enough to make a live stream straight on YouTube if a script for the subject to be taught is clear enough. If the script will be consisting of various subcategories or otherwise many things to add otherwise in post-production, it might be better to be saved on a local drive.

On sessions of tutorial making it was found out though that OBS Studio software has a choice to stream live to YouTube and simultaneously record captured material on a local drive. That might be the best way to work if there will be a lot of editing afterwards and if computer space is not a problem.
4.3 Testing

Testing was implemented for the results of this project to be utilized in the next iteration of the creating virtual content for the Media Elements course for improvements. It was important to validate that the chosen content creation method and tools are functional, high-quality and meet the needs of the target group.

The building of the prototypes based strongly on involving students from early stages of the building process. The concentration was in the twenty percent key values that will produce the most crucial elements for the client just like in 80/20 rule discussed earlier in the thesis. Another strong influence in the building process were the benchmarking interview results. In addition to that, usability of the prototypes was considered a key element in the process.

4.3.1 Usability heuristics

For usability heuristics, usability guru Nielsen’s research was used as a source to achieve a proven working user experience. On the Nielsen Norman Group website are listed 10 usability heuristics guidelines for user interface design. These guidelines were used as a support on top of collected questionnaires and study workspace guidelines by Laurea.

Nielsen lists down ten points on how to achieve a balanced user interface. The visibility of system status is mentioned first. It is explained in a way that all users should be kept informed on what is happening in the system and all users should always get a visible and preferably also audible feedback on what they are doing. (Nielsen 1994.)

Nielsen Norman group also tells on their page about the importance of consistency and standards, flexibility and efficiency of use and aesthetic and minimalist design. These are some of the things that were found important while planning and creating content. (Nielsen 1994.)

User stories and benchmarking results exposed that usability is extremely important when building a virtual course. The usability of the virtual course content is concepted for the Media Elements course learning platform, the usability guidelines are taken into consideration in the workspace building process. Folder order, compact content and a progress bar with changing current content for students to be able to follow the course effortlessly.

Error prevention was also an especially important aspect when designing both course content and how it will be implemented in the future learning environment. In tutorial videos, error prevention will work in a way of showing followable narration in the form of subtitles or as a self-reading narration script below video, which would need some work to develop.
4.3.2 Empirical Interviews

The empirical interviews were conducted to peer students and potential target group of Media Elements course. First, the interview questions were planned and the chosen group of people to be tested were asked for a permission for the interview. A quiet place for testing was chosen. In the test situation, the test subject was first welcomed to the test situation and it was explained that the object of testing is the prototype, not the test subject itself.

The test situation began with explaining the task to the test subject. In the first user story interviews the task was to view the shown example videos and to comment aloud and leave feedback of the videos. Also, a set of interview questions and user stories were collected and later analysed, and the most important findings were collected to be utilized in the development process.

All example videos were screen captures of different software with varying amount of talked voice-over or just music on the background. The researched area was about how much narration affects understandability of the tutorial. The test subjects were also asked about other ways they would want to make the tutorials better. Given feedback helped also to find out other aspects. General tone of voice influenced the way of how instructions were perceived. Rate of speech is best to be prompt but clear and upbeat.

There were additional questions for differences how teaching based around contact sessions differs from virtual teaching. Results were that often on contact sessions it is easier to stay on track of the pace of courses. Students can also ask help from their peers and teacher. It is vital for students to feel the same level of certainty to get help in their project work in case they get stuck. It is good to therefore have a help area in the workspace where students can write questions that concern them. Those can then be addressed and answered by teacher or peer students.

In the prototype video testing, a testing of the first manual tutorial video, the task was for the test subject to view the video once and then the test subject was guided for the task. The task was to livestream to YouTube with OBS Studio by following the tutorial video instructions. The time limit for the task to be successful was set to 30 minutes and the timing was calculated with setting a timer on a mobile phone on as the test began.

Through observation and collecting feedback it was possible to find out if the prototype was indeed a success and all the improvement ideas were taken into account for the next iteration process. The results were that each test subject successfully managed to follow the manual tutorial instructions and completed the task in less than 30 minutes. Tutorial feedback was positive but also some improvement ideas were collected.
5 Results

The team of this project was able to find key elements how to make tutorial video study material around a media centred virtual course efficiently. The outcome of the sprint was the “working wheel”, a method of the most efficient way of creating virtual content for a rapidly changing software study content. The “working wheel” was created with the help of interviews and benchmarking results.

Further outcomes were a concepting the course content in a future learning platform, the creation of a functional YouTube platform channel for the course, creating self-made photographic content to be used in the tutorials, tutorial video manual of the content creation method, Adobe Photoshop software video tutorial prototype and scripts for the following Adobe Photoshop software tutorials.

6 Conclusions

Making of virtual course content can be time and resource consuming but with the right platform and tools, frequent testing and involving the users from early on, it is possible to create frequently updated and high-quality virtual study content. By following guidelines discovered in this project, improvements can be made using the interview and benchmarking results and they can also be used in other virtual content creation projects.
References

Printed sources


Electronic sources


Unpublished sources