Unit 30 - Computer Graphics

Assignment 1 - Hardware and Software

Daniel Easteal

Contents page

Introduction

Throughout this assignment I will be going through the different ways that images can be created/edited as well as the different file formats that these images are associated with. In addition to this I will also be explaining the legal issues that arise through the use and creation of images and who owns an image. Finally, will also be going through the history of output mediums for images and how this has effected the design process of images. All of this will be so that I can show I understand the technology behind the creation of UTC reading publicity material.

P1 - Describe the hardware and software used to create and edit graphic images

In this section I will be describing the different type of hardware that are used in graphics as well as how these are used when doing graphics. In addition to this I will also be describing the software that it available and how they compare for different tasks. The main components in a computer that are used heavily and required for graphic processing are as follows:

* Monitor
* RAM
* Graphics card
* Processor
* Hard drive

Hardware

Monitor

The main piece of hardware that is used for graphics editing and creation is a monitor, this is used to view the images and that you are using and as such it necessary to complete any graphical work. The ability to view the images well might seem trivial but the only other real alternatives that exist would be to constantly print out the images in order to see what you are doing or use a terminal that can only user ASCII characters and as such this would not be high resolution.

RAM

Another main component that is used in the processing and creation of graphics is computer memory, or RAM. This is used generally for the ability to have many things running at the same time or many things running at the same time and that these programs can have enough space to run all of these things (this is not the processing ability here). Within the context of graphics, the use of more RAM will allow the user to edit larger images quicker (as they can all be stored in RAM and not on the hard drive). In addition to this, having more RAM will also allow the user to apply more effect to an image as these can be stored temporally in RAM and this will make it go smoother.

Graphics Card

Another quite important component in computers that is used for graphics creations and editing is a discrete GPU or a graphics card. This is used to unload processing that would normally go to the CPU and it is sent over to the Graphics card where it can be processed off the main system processing and can be processed faster than normal. This can be processed faster on a GPU than a CPU as the GPU is specifically designed to be faster as processing graphics as it has many more processing cores than a CPU but these are lower clocked ad image processing is normally the same calculation applied to the different pixels of the same image. This will help with image editing and creation as it will allow all of the effects that the user will apply to the images to done done faster and as such they will save time when applying these effect. In addition to this the addition of a GPU

CPU

In addition to the other components that are in a computer a high-end processor is also used in image creations and modification. With a high end processor in a machine that is used for graphics processing the user will be able to do general tasks on the computer as well as simple tasks quickly. In addition to this high end processors will also have the ability to run more things in parallel as they tend to have a higher number of cores and a higher base clock that is used for processing the images and graphics. Furthermore, with a higher end processor in the machine the user will be able to run the whole program faster.

Hard drive / SSD

The final computer component that I will be listing here is the hard drive or really any main storage medium for the computer. The main two examples for this would be a hard drive and an SSD. The main reason for having a large hard drive and the reason that it would be useful for graphics and image editing would be the reason that the user will have the ability to store lots of different images and image files / software. At the moment the size of the average large hard drive would be about 1 to 2 TB and with these you can store many many different types of files. This is also a good idea as it means that you can have a backup of all of the images you make so that you will never lose them in any case and it is also important for what you are uploading images online as you will have to store all of the images on your computer before you can upload them.

With all of these the positives of one can be seen as negatives of when you don`t have one of those components as that benefit is not available.

Software

When actually creating digital images and graphics there are many different types of software packages that you can use, however in this section I will be only explaining a few of them that are available. The main differences between software that you will be looking for is if the software is one for raster or one for vector editing. For this comparison of software I will be comparing MS paint and inkscape.

Inkscape software uses vector graphics and Ms paint uses raster options.

The main difference between these is that inkscape store the equation of the line and the items that are being drawn. This is a positive as it means that the image that is created at the end has the ability to be zoomed in and moved around a lot yet it will still keep its original quality throughout the process. On the other hand the file size when using this type of image can get quite large and the software that it uses is far more complicated in most cases.

On the other hand the alternate type of image format is raster and this used by MS paint. This works by storing an array or a grid of all the colour information for each pixel. This is great as it means that the actual image file is quite small and it can very easily be compressed so that it is even smaller and that it is also very easy for downloading the image through a slow connection or where the size of the download is limited. In addition to this, in most places the software that is used for raster images is a lot easier to use and as such it is more friendly to beginners. However, on the other hand the software that mainly uses raster images can be a lot simpler and as such not have the same functionality.

In addition to these two pieces of software there are also many other graphics editing software available. One example of this would be the type of software that is available for use within a web browser. A main example of this would be a website called PixlR, this is a website that offers the ability to edit images through their online service with access to a large variety of tools that is similar to Photoshop. These types of software can generally be both used for both raster and vector graphics due to the fact that they are offered in the web browser and that they will not have the most advanced features available. Finally, these pieces of software that run online are also generally available for free due to the fact that the software contains a lot of adverts inside of it and that the company will also take the customers information and get money off of that .

P2 - Explain how different types of graphic images relate to file formats

In this section I will be explaining how different types of graphic images relate to file formats and how these are used. To start off with I will be listing the main types of graphic file formats and how they store the information for the image file and how these files are then used for graphics editing.editing. After this I will then give examples on the file formats That can be used to save each type of image (raster and vector).

Raster Graphics

As explained before there are two main ways that images are stored and worked on and these are vector and raster graphics. The main difference between these is that raster graphics works by storing the information about each of the pixels in the image with their Red, Green, Blue and Brightness values so that they can be projected to any screen and the image would look exactly the same. This will then store up to 8 bits for each pixel in regard to their red green and blue elements. This will then mean that there are up to 255*255*255 different values for each pixel (not counting the brightness) and this will represent the image on a screen. Due to the way that this is done the files can be compressed quite easily as a lot of the image will be the same colour and as such it can be compressed down with a loop saying that this general area is just green and this is how lossy compression works. In addition to this due to the fact that the image is stored based on individual pixels the resolution and therefore overall quality of the image will be limited based on this. This can then become a problem when the image needs to be blown up in size and all of a sudden all of the individual pixels can be distinguished and the image when viewed close up will not look pleasant.

Vector Graphics

On the other hand the other main type of image storage is vector graphics/images and as the name suggests, these use vectors to store the information about the image. These work by storing mathematical calculations about the image as well as what area are filled in with what colour and the equations of all of the lines in the image and their direction and so on. The main advantages of this is that the image can be broadcast and blown up to a large size without losing any of the quality as the equations will just scale up to the correct size and work just as well as they would do at a lower scale. Unfortunately due to this the file sizes of thus type of image are in most cases larger than their raster counterpart due to the fact that they cannot be compressed easily as the equations have to be exact without any loss and so these files are often compressed in a lossless form. Furthermore due to the way the images are stored they cannot easily be read by all programs and as such they may have some compatibility issues with lower end software for editing graphics.

With either of these different methods there are certain file types accosted with them in the form of the file extension at the end of the file and the way the raw data will be read by programs in order to be decoded.

File formats

Vector file formats

The main type of vector graphics file format that is used is SVG and this stands for Scalable Vector Graphics and it a format that stores the information about the lines and the fill colour within an image to fit into the vector graphics standard. This is by far the most common standard, but even still its use is limited aside from the advanced graphics side of graphics editing and creation due to the other limitations that the file contains and the fact that you need quite a complex parser for the file in order to read its data and get the image on screen. In addition to this the standard for SVG is all open and the way that the data is stored is through the use of .xml files and because these are plain text files they can easily be edited by most text editing programs and this can be thought of as a type of markup language.This technically means that it can be edited and created with just a text editor but in actual circumstances this would not be practical and an actual software that is designed to deal with this would be far better.

Some other examples of file formats for vector graphics that work mostly in a similar way (but there are of course some differences) are:

```
* .ai
* .eps
* .pdf
... and a few more, special uses ones
```

Raster file formats

When talking about the different file formats for bitmap files there are many, many different options to consider as there are loads of different file standards for bitmap images. Due to the abundance of bitmaps within current popular use, most of these files will be very recognisable. The main ones on this list are:

```
* jpg
* png
* bmp
* jpeg
* raw
... and many more
```

With these images the data that is being stored is just a variant of storing the red green and blue elements for each pixel and sub-pixel with varying levels of compression and different methods of storing the data so on... The reason that these file formats are so popular is due to the fact that they are very easy to integrate with most things and that the file sizes are quite small for easy transmission and communication to and from different computers. Furthermore, the software that is required to decode almost all of these file types are very simple and lightweight so that they can run easily on all machines and they won`t use too much power on battery power.

P6 - Explain the potential legal implications of using and editing graphical images

Legal implications

In this section I will be explaining the different legal implications that are involved with the use of image creation and editing as well as what the copyright law and covers as well as where you can get images from online that you can use however you want to.

To start off with, there can be many different legal implications that you will have to take into account when you are using or editing graphical images and these can include such things as:

```
* The images not being publicly suitable for their purpose
   * not safe for work content
   * inappropriate theme for the target audience
* The images not being available for use by the creator
* Data protection act
* Copyright law
... and many more
```

Because these legal implications are in effect, if am image is created or made then the image must pass these legal standards and this can mean that the images might have to be changed before they are released.

Public decency

An image may have to be edited if it is deemed to be for too indecent in a public place, this can cover many forms but the main gist is that the image must actually be suitable for lament in a public area without it offending anyone. This could mean that the image could contain nudity, hate towards a group of people, or general discrimination. If any of these are shown to a certain level that could offend people then they must be removed from the image. Furthermore, this could also cover the fact that the image id completely wrong for the target audience, even if it is not being mean or hurtful it could be seen as so if the target audience is not appropriate.

Permission

The main legal implication that has to be looked out for is the fact that an image might not be available to be put up, and this can happen due to a variety of reasons. The main ways that this could happen would be that the image contains work inside of it that has been done by someone else and they have not allowed this to be shown or it contains an image of a person and they have not allowed the image to go up if they are in the picture. For the first example, this can be very easy to avoid but difficult to spot if it does happen. This will also (in most cases) fall under the act of plagiarism and this is a separate but very closely related topic and they differ by the fact that plagiarism happen on purpose whilst in most cases the incorrect permissions happen accidentally by just not realising that there was another piece of work in the image. Due to this reason, this can be easy to avoid as you just have to make sure that the image contains nothing that other creators could very easily claim is theirs and is restricted in its use, (possibly due to the fact that they sell its use or they make an income form it). But it is hard to spot as you would have to know very type of work if you wanted to be 100% sure that it contained no other work and that would be impractical. As well as needing to know if someone's work is in your work it is also very important to people that their face is not in images that they do not want as this is a very personal thing for people. This means that if you have the face of someone in your image then you will either need to get permission from them in a tangible form that can be reproduced at a later time, or you will have to remove their face from the image. With the first option here this is generally the most common one due to the fact that people will more than likely co operate with you but you will need to keep their consent to them being in the photograph just in case a problem arises. However, in the second case the consequences can damage the image that you have quite badly. This is because you will have to make sure that you remove the ability for the person in the image to be identified through it, but this can take many different forms. For example, you might just be able to crop them out of the image and if so then that is good as it might mean that you can still use the smaller image and it might not be affected too much A bit further down the spectrum would be that you would have to blur the persons face in order to actually legally use the image, this is because with the blurred image you would not be able to tell who the person is and as such they remain anonymous in terms of the image. This can be quite bad for the overall image as it means that you would have to have a blurry bit in your image and in some cases that could be quite distracting to the image especially if the blur is quite large / over a high contrast area. But the last way that you could deal with this is also the worst yet most simple and that is that the person does not allow to use the image that they are in at all and as such you would have to throw away the image and you would not be able to use it at all and could lose a great image.

Data protection

The final part for this section (because copyright needs a whole topic if its own) is data protection. Now this does not necessary cover the data protection act but cover the fact that any images you use should not contain any information that you don't want out or or information that anyone does not want out there. Although this can be thought of as quite similar to the previous statement, it is a little different as you might not know what weather someone wants that information out

there but you should guess to that and you will have to make sure that all the information is as correct it can be. For example, if an image that you are using contains information about where someone lives like it could be just some text off to the side, then you should nit use that image to hide the information as you should protect the data of that person.

Copyright act

In this section I will be explaining and providing examples of what the copyright act is.

To start off with it would probably be best to simply state what the copyright act actually is.

Directly from the copyright service website (https://www.copyrightservice.co.uk/copyright/uk*law*summary) a brief description of the Copyright, Designs and Patents Act 1988 is as follows:

> The Copyright, Designs and Patents Act 1988, is the current UK copyright law. It gives the creators of literary, dramatic, musical and artistic works the right to control the ways in which their material may be used. The rights cover: Broadcast and public performance, copying, adapting, issuing, renting and lending copies to the public. In many cases, the creator will also have the right to be identified as the author and to object to distortions of his work. Copyright arises when an individual or organisation creates a work, and applies to a work if it is regarded as original, and exhibits a degree of labour, skill or judgement.
>
> Interpretation is related to the independent creation rather than the idea behind the creation. For example, your idea for a book would not itself be protected, but the actual content of a book you write would be. In other words, someone else is still entitled to write their own book around the same idea, provided they do not directly copy or adapt yours to do so.
>
> Names, titles, short phrases and colours are not generally considered unique or substantial enough to be covered, but a creation, such as a logo, that combines these elements may be.
>
> Normally the individual or collective who authored the work will exclusively own the rights. However, if a work is produced as part of employment then normally the work belongs to the person/company who hired the individual. For freelance or commissioned work, rights will usually belong to the author of the work, unless there is an agreement to the contrary, (i.e. in a contract for service).
>
> Only the owner, or his exclusive licensee can bring proceedings in the courts against an infringement.

One important thing here to note is that this is in no way the full Copyright, Designs and Patents Act of 1988 as this cover many, many chapters and sections and would be unusually long in this document. However, if you do want to see the full actually legally binding document then you can go and have a look here:

> *http://www.legislation.gov.uk/ukpga/1988/48/contents*

Now back to the actual task at hand, understanding this copyright act, basically it is in place to ensure that the things that people create are protected from other stealing them can claiming them as their own, kind of like plagiarism as it is a type of copyright infringement in some cases. When you are doing image editing or creation it is very important that you stay within the copyright act as it can lead to anything from your image being taken down or you being sued for a lot of money. Furthermore, if you are doing this image creation and manipulation as part of an organisation then it could lead to you being fired.

Obviously, you don't want anything like this to happen so you would need to look into how you can use images correctly and be very careful of using work that you have not created from scratch. The main way that this can be stopped is just by creating all of the work that you will use your self and therefore no one apart from you can claim ownership for it. However, if you have used or need to use another persons work then you just need to ask them before hand to see if they are OK with it, even if you are just using it as an interpretation. This is because in the copyright law extract above, the second paragraph mentions that the use of a piece of work as an interpretation is up to the owner of the original work to decide if it infringed on their work not up to the editor of the work. This just means that even if you don't copy the work directly but you just interpreted it then you will have to ask before hand.

However, not everything that someone else has made can be subject to copyright laws because some things are just too vague that someone cant claim ownership of it as it would not make sense. The main example here would be the use of names as they are far too vague to be subject to copyright. For example, if you made a company that sells fruit and you include "apple" in your company name that you would not have legal actions with apple the technology company because "apple" is the name of a fruit and is far too vague. However, this is not extended over to logos as these will definitely be covered by copyright so you cant just have the apple logo as your company logo and that would not make sense and apple could early sue you for that.

However, one more addition thing to note is that if you produce a piece of work for a company then the company would have all the copyright for that piece of work in most cases. For example, if you create a company logo for your company under instruction from the company then you will obviously not have all of the rights to that piece of work. This would then mean that you would not be able to put up a copyright claim against the company for using your work as you made it for them.

One final thing to note about the copyright is that only the full owner of the material/work can make a claim against its use, not anyone else. For example, if you see that one of your friends work has been used else where then you cannot take it up in court as you don't know if your friend has already agreed with them that they can use it and you would not have the correct legal right to claim against something that isn't yours. This could be in the form that you don't have the correct paperwork showing certain facts about the work or the ability to say weather people can or cannot use it.

From this explanation you can see that if you create an image then you are the owner of that image and of anyone tries to take/use the image in their won work then you might be able to take action against them. However, as you have seen above this does not apply to all situations as there are exceptions. From this you should now know who owns an image when it has been made and how you can go about to use one that you don't own and the certain ways that you can take action against someone who used your image or what you have to do if you use someone else's image.

Royalty free images

For the final part of this section I will go on to identify three different sources where you can get images that you can use for free and in any context that you want.

These types of images are called royalty free images as they have no royalty attached to them and you don't have to say who made them and so on. One warning with most of these sites is that they will give out a few of their image for free, but these images will have their company watermark over the image. This is because they are a company and need to make money and as such if you use their images for free then you will be giving them free advertising. However, what most of these sites offer is the ability to create an account with them and pay money on a regular basis, this will then allow to use all of the image that they have for free and in any context without the watermark on them. This way they will make money and this is something that you will have to look out for when using royalty free images.

With a quick look on google you will find a whole lot of sites that offer these royalty free images, so here I will just list a few of them that are the most popular.

```
* ShutterStock.com
* Pexels.com
* pixabay.com
* gettyimages.co.uk
* freeimages.com
```

With all of these websites they offer the ability to use their image for free completely and you don't have to worry about any of the claims about copyright explained in the section above. However, as mentioned some of them will need you to pay for the companies watermark to be removed fro the images.

M1 - Compare the limitations of different hardware and software packages used in graphics work

In this section I will be comparing the different pieces of hardware and software for use with graphics editing. To start off with I will be comparing the different hardware that is used to capture images to be used for photo editing. When capturing images there are different ways that they can be captured/produced. The 2 main ways that I can think of would be:

```
* Photography with a camera
   * Film
   * SLR
* computer render
   * capture card
   * Desktop render
```

The main and most predominant way that photos can be captured and then edited it a computer is through the use of a camera and then loading this into a computer. For this there are two main that the images them selves can be taken, and this is through either the use of a (D)SLR camera or a film camera. With these pieces of hardware the user will need to take a picture and then transfer that image to the computer, this can be done a few different ways and it depends on the hardware type. For the film the user will have to take the negatives of images that they have in the camera, develop that and then they will be able to scan it into the computer. With this method the resolution and quality of the scanner will probably be the main factor / limiter to the quality of the image. After this it is then on the computer. For a (d)SLR camera the process is very simple as you just have to take out the storage medium (normally a SD card) and put that into the computer to read the information off of it. The main differences in actual camera performance between the film and DSLR is that the film cameras don`t have their image size limited by pixels but instead they have them limited by grain as the pictures is captured as chemicals in the film rather than pixels in a sensor and as such when the image is blown up the image will look splotchy rather than pixilated.

The other hardware that it used for capturing images would be through computer rendering and then capture. This can cover many different types of images and image types. For example, with this you could have the option of a high quality 3D render or a digitally created painting and with all of these they may use other images that were actually taken on a camera but the final image is one that has been rendered and created on a computer. In addition to this these images may also be taken from other computer systems that don`t support the ability to actually output these images in a useable format, and in these cases a capture card will be able to take the output that they would send to a monitor and then save the file in such a way that it can be saved and used for other purposes. With these type of images and image creation the main limit to the quality and depth of the image is the power of the computer performing the rendering of the image and the complexity and level of detail that the program can provide and the user puts into it. With these computer renders and generation the final image can look like anything that the user wants it to and is not constrained by real world realities and features, as such they can contain many more interesting things, however because of this the images can look quite fake and this is undesirable for these images and they will be considered bad. These can be, in most cases, be considered better than normally photographs however some people consider them always worse as they are not original images.

In addition to this, (as mentioned before) there are many different types of software that you can use to edit and to manipulate images and in this section I will be explain and describing the differences between them and how they work. For this comparison I will be comparing the abilities and the functionality of both MS paint and adobe Photoshop.

To start off the comparison I will be comparing the features of the different programs and their ability to edit they actual images. When talking about MS paint you will see that there are not many different features that are available for the user to use so that they can edit the image. From looking at the bar at the top of the screen you can see that there are only simple option available like the ability to add in colours with a few simple and different brushes and simple shapes. In addition to this MS paint also has the ability to add in simple shapes to the image that can be in a few different colours. A finally thing that MS paint can do that is worth mentioning is that it has the ability to also do selections within the image that you can then use to move around the within the image and also save as a separate image. This selection functionality can also be used to select an area that you only want to be able to draw in so that you can have defined borders when you draw so you only edit a certain part of the image.

From this you can see that MS paint is very limited in what it can do as it only contains a limited amount of features in the software and as such con only be used for very basic editing. This can be shown as it does not have the main ability to have multiple layers (a main staple for editing software) which limits its functionality a lot. Furthermore this software is also limited by the fact that it only has access to basic editing options in terms of brushes for paining and the shapes that it can use.

When this is compared to adobe Photoshop the program cannot be compared by the features that they have due the fact that Photoshop has so many more features that are also all far more advanced than MS paint, however this is to be expected because MS paint is free and included with all versions of the windows operating systems while Photoshop costs a lot of money and is a professional application. The main features that Photoshop has that MS paint does not have is the ability to have different layers that can show through each other and each contain afferent images. This allows there to be far more complexity in the image as all the different layers can be created individually and this allows for them to be thought of as images themselves. Furthermore Photoshop also supports far more complicated selection and processing tools that allow the end picture to be much more defined and precise without the user having to go all the way down to the pixel level. These selection modes can select between the same colour all throughout an image as well as selecting an area in general through its rough shape as well as the ability to apply advanced effects throughout the whole image.

However, although it may seem like it could have no possible limitations there is one main one and that is the availability that people have to buy it. Due to the fact that it has all of these features the program is very expensive to buy and as such not everyone can have access to it unless they pay a lot of money.

From this comparison you can easily see that Photoshop is the more advanced and full fledged image editor when compared to MS paint. However, this is expected but it would be better to also compare Photoshop with PixlR due to the fact that PixlR is designed to be more of competitor with Photoshop due to the features that it has and the audience that it presents to.

With PixlR there are many features that it has which are the same as Photoshop like the ability to have layers as well as the abundance of tools that you can have to change certain aspects of the images. However, due to the fact that this software is being offered in the browser and the fact that the software does not cost any money to use the software is not as powerful as the full version of Photoshop. Whilst it still does have a lot of the more advanced features like the ability to have multiple layers and the ability to select certain areas of the image the features are not as defined / precise as they could be and they have a limited functionality. This also shows that PixlR is more advanced than MS paint as it has all of these features and the fact that it is free shows that it is available for the same people as MS paint would be for. Furthermore the fact that PixlR is only available if you have an internet connection is another limiting factor as this means your computer has to be connected to the internet if you want to edit an image.

With these different types of software the most frequently used for actual work would have to be Photoshop by far due to the fact that it has all of the functionality of any software program like it and because it is is popular everyone knows about it and so everyone uses it when they can. After this would have to be PixlR due to the fact that it has a lot of functionality even if it is not fully complete up to Photoshop standards and because it does not cost anything and is free. Finally there would have to be MS paint because it has not a lot of functionality even though it is free and comes with the most popular operating system.

D1 - Evaluate the impact of evolving output mediums on the design and creation of graphic images

In this final section I will be going through a brief explanations about the history of output mediums for images and graphics, and how this has effected the creation and editing of images. This will be mainly going through how the output mediums have evolved over time.

To start off with I will be listing a few of the output mediums that are used for as an output medium for images and I will then compare these in terms of user usage, speed of showing the image, cost that is associated with them, how many people can see it at a time, weather it is intended for an editor or a user and how old/new the technology is. After this I will then go on to explain each section in more detail and how new these technologies are and how they are looking in the future as they evolve.

Output medium | Usage | Speed | Cost | People | Use Case | Age ----------|----------|----------|----------|--------|----------|---------- Desktop monitor | High | V Fast | Low | Few | Both | Medium Printer | Medium | Slow | High | Many | User | Generally old Phone | V high | V Fast | Medium | One/Two | Both | New Paper | Low | V Low | V Low | Many | Both | V old

Desktop Monitor

Usage

The first example of an output medium that is very much so used today for creation if the desktop monitor. This is a brilliant output medium as it is used heavily in today's world as all desktop computers will have one. Due to this fact the usage of a desktop monitor is very high as all computer have one and as such they are almost universal in what they can display.

Speed

The next topic is the speed, this is a measure of how fast it takes to get an image on the output medium. In the case of a desktop monitor, this is very fast as I am sure you are aware as the pixels take milliseconds to change colour and display a new image. Due to this, a large quantity of images can be looked at in a short space of time because it updates so quickly.

Cost

The next topic is the cost that is associated with the output medium, for monitors this cost is relatively low, this is because you can get really cheap monitors for about Â■30. This then means that almost everyone can afford one and as such using this as an output medium can reach a whole lot of people. This can be great for a business as designing their images for use with a monitor would mean that they can connect to as many people as they can.

People

The next section is how many people it is designed to reach. With a monitor the number of people it is designed to reach is 1 or maybe a few more if people crowd around. This may have an impact as it means that generally if you design for a desktop monitor output then you will only have one or so people view the image for each monitor, and when compared to other output mediums that can be bad.

Use Case

The next topic is weather the output medium is designed for someone who is creating images or is viewing these images. With a monitor, as you can guess, it is designed for both people creating the images and those viewing them. It is designed for people who are creating them as it is very very easy to use it when creating images due to the colour representation, speed of the image updating and the fact that there are load and loads of images software designed for desktop use and all of these will use a monitor. In addition to this it is very easy to create on a desktop as the also contain a lot processing power in the form of CPU and GPU that can be used to edit and create images very quickly. Furthermore desktop monitors are also designed for the user who is viewing the images as they are very cheap and most people will have a computer with a monitor. In addition to this it is very very easy to implement the images that are created on a computer to a website that other computers can browse. This will then mean that all other desktop monitors can easily access these images and display them in a very simple way to loads of people. Due to this a company would also want to do this so that they can get their images to as many people as they can.

Age

The final section here is about the age of the output medium and how it is compared to the others in this list. As you can probably guess, the desktop monitor is exactly a new invention, however it is not really old like some of the others on this list. From this I mean that they have been around for about 30 years and as such they are not the new thing in technology but other things here are older. From this age you can see that it is not exactly an emerging technology as monitors are as good as they will most likely get with there just being advances in the size of the screens and how many pixels they have in them. Due to its placement its new enough that almost all people will have this but, its not new enough for people to still be evolving its technology by great amounts. However, Due to the fact that they are getting higher and higher resolution as companies work on them this means that higher ad higher resolution images will start to become the norm. This can have quite a few side effects that I will explain but feral it means that images will become better and higher quality.

Overall

Overall having the main output media for your company being a desktop monitor will mean that you can reach a whole load of people with your images and it is also a cheap way to design and edit graphics. When looking at the effect that this has had on the creation of graphics images then a desktop monitor is one of the most major changes that has ever happened as it has allowed for there to be highly advanced software that can do anything that you want to an image and much more that you could have thought of previously. It allows for multiple layers to be done very easily and the ability to live edit any part of the picture to exactly how you want it should not be understated as before desktop monitors this would have been extremely hard and not possible to do.

Printer

Usage

In this section I will be explaining about the printer and the printing press and how they have effected the production of images in a similar way to how I described the Desktop monitor. TO start off with the usage of the printer in the current world is at a pretty medium level, this is due to the fact that we can all send each other all the documents that we need through computers in a digital manner. This then means Thai there is no need for printing of images in order to send them to people as it can be done online. However, printing still has its use when it comes to advertising and showing off your company in person rather than online, this is because in these cases you will have to show off your images in actual print rather than on a monitor otherwise someone could have just gone online to see them. In addition to this, printing is still used quite a lot for distributing images among many people at a public event where you do not have contact information for everyone there.

Speed

Next is the speed section, when talking about the speed of a printer for producing images you may think that it is quite fast especially with modern printers that can print pages in seconds, but compared to the desktop monitor this is a very slow process. This therefore means that if you were to produce print for an event then you would need to make time for printing all of the material that you need as otherwise it will not be done in time. Furthermore you cannot really use a printer for editing and creating images as the tome for it would be far too slow and you would need to use some sort of computer anyway so you might as well just use the monitor on that instead.

Cost

Next, onto the cost. With this it can be measured in two different ways, but both are still relatively expensive these are the costs for the purchase of the printer and the cost fr the use of a printer in terms of paper and ink. When talking about the cost of a printer the initial cost can be quite high as they can cost a few hundred pounds easily and this is quite lot more expansive than a monitor. Additionally printing also has the usage cost unlike a monitor (I am excluding electricity costs here as they would be negligible) due to the fact that you are using up paper and ink when you print and these cost money as well, like Â■30 for some ink and maybe Â■20 for a stack of paper.

People

However, one upside about a printer is that its output medium of paper can be distributed around to many many people in a public event and this would mean that for a single use of the printer you can get your information to a whole lot more people than you could do a monitor. This may be what you want as you are trying to get your message and images out to everyone at an event.

Use Case

However, as mentioned before another limiting factor of the printer would have to be the fact that it is only designed for the user and not the creator. This is because you cannot design and create images with a printer you can only really see them and as such its intended for the user only. However this is not too bad as that is its purpose and you can easily use the monitor with the computer you printed from to do the designing and it would be far easier.

Age

The final section here is the age of printing, as you can guess this technology is quite old and has been around for age. Due to this fact there is not really any sort of evolution / changes that happen to this output medium apart from simple technology changes like higher quality printing and higher printing resolution and faster printing speed.

Overall

Overall a printer is a very good output medium for spreading your images and messages around a large group of people that you do not have contact information for. It has also enabled people who create images to far more easily distribute their images in a physical format to a large group of people and this has enabled people / business to become noticed in the public eye from not just being online.

Phone

Usage

For this section I will be going in to write about the new technology of mobile devices and how they can be used as an output medium for images. To start off with the usage of mobile devices is very very high as almost all people will have a mobile device with screen and as a bonus these people will always have these devices on them, not just with them when they are at home. Due to this fact if you plan to use mobile phones as an output medium then you will have the largest group of people in this list with the ability to see your images whenever they want. Furthermore, because these devices are used so much and people always have it on them then you will be able to have people always alert as to when you release a new images and they can help with helpful advice on it if you do it correctly.

Speed

Secondly, as with the monitor the speed of the device for displaying images is very fast and they use the same technology as the monitor so for this section just read the monitor section again bit keep in mind that mobile devices are slower and as such they wont be as fast at editing graphics and so on, but in terms of their ability to display images then it is the same.

Cost

Thirdly there is the cost of the device. With mobiles the cost cab vary a bit from very cheap phone to big expensive ones, but the main difference between mobiles and desktop monitors is that you have to buy the whole the whole device not just the screen part and phones are basically all in one computers. This will of course increase the price a lot and due to the fact that you are also paying for the fact that the device is so small and powerful then you are paying a lot more than just a monitor. However, you will still (in most cases) not be paying as much as a printer and so the price is pretty medium.

People

Next is the number of people that can see the phone at the same time and how many people it can get to. For a phone due to the fact that it is a very personal device and the screen is very small it is only really designed for one person to see at a time and so in this regard it is quite similar to a desktop monitor so for this section it is again very similar...

Use Case

Now for the interesting part, the use case for mobile phones you might think that the use case would be limited to just the users and not the content creators, but it is the opposite. This is because due to having a mobile devices the content creator can now do the work that the need to do on the go rather than just when they are at the office. Now by no means will the mobile software or hardware be anywhere up to the performance or capability of the proper desktop version due to the fact that they are small and portable and only really have a touch screen for interface and control. However they do have the ability to do some simple tasks and that is all that it takes for the content creator as they can make a quick touch up here or change colour here slightly while they are on the train and as such this has allowed them to do their work wherever they are as they will always have their mobile with them. This has made quite a big change within the world of graphic image as it has allowed the work to happen anywhere and not just at the office or at home, and while this may not be as big as a change as the ability to use proper graphics n a desktop monitor it has allowed for work to be completed. So the effect that this has had on the creation of graphic images has been quite a lot.

Age

The next section on the list is the section of the age of the technology and for mobile technology this (when compared to the other options) is very new as mobile technology has not been around for very long. This therefore means that all of the options for changes and there evolution would not have had time to full reach their potential and as such this means that there is most likely more change to come in the future for mobile technology and that it can have an ever greater impact for the creation and editing of images. In addition to this the fact that this technology is quite new also leads to the fact that most people will at least have some mobile device that a company can use as their output medium to reach them.

Overall

Overall the fact that mobile devices are carried around by everyone and that nearly everyone has them means that they are an amazing tool for images to reach people and for creators to edit and change their pictures wherever they are at any time. Furthermore the fact that this is a relatively new technology means that the ability for there to be further advancements of this technology in the future is very high and this could become one of the best changes to happen to image editing and creation.

Paper

Usage

For the final section of this document I will be writing about the old and probably original output medium for creating images and this is of course paper and drawing on it. To start off with is the usage of this output medium ad of course in the modern day this is really not to high as it is far easier to use all of the software and abilities of a computer and a computer monitor. Due to this fact its use in professional image editing and creation is quite low and it is only really used for quick mock ups of final designs when you do not have a computer at hand.

Speed

Secondly there is the speed of this output medium and this would be very low due to the fact that you have to actually manually draw out all of the lines that you want and colour it and so on and at the end of all of this you will only have one copy of the result. Furthermore this will also take extra time if you are very precise with how you draw your lines.

Cost

Thirdly there is the cost of using paper as an output medium and this is actually quite cheap as paper is very cheap (especially if you buy in bulk) and pencils for writing are not that expensive and although they do have an ongoing cost it is very cheap.

People

Fourthly there is the amount of people that paper will lead to seeing. This section is basically the same as the printer section on this so you can read that there.

Use Case

Fifthly there is the use case of the paper and this is basically both used for creator and user due to the fact that the creator will have to draw on the piece of paper and they will also have to show people their drawing on that piece of paper because they cannot get the drawing off of the paper. This then means that the creator will have to show the drawing to the users on the same piece of paper and as such it is used for both creation and viewing.

Age

Finally there is the age and as expected this is very old and as such it is not new and has not had any changes recently at all.

Overall

Overall this means that this is an old form of output and it is not very usable in today's age and it will not any more changes anytime soon but it is always a reliable output medium that will work if all else fails.

Conclusion

Overall throughout this document you now know the different hardware and software that is required for image creation and editing as well as the file formats that are used. In addition to this you also know the legal implications of using pictures and limitations of hardware and software as well as output mediums throughout the ages.

Bibliography

ShutterStock.com

Pexels.com

pixabay.com

gettyimages.co.uk

freeimages.com

http://www.legislation.gov.uk/ukpga/1988/48/contents

https://www.copyrightservice.co.uk/copyright/uk/*aw*summary