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JUMP

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[DOES SCIENCE-FICTION PREDICT THE FUTURE??]

[This research paper looks at a selection of science-fiction films and its connection with the progression of the television, the telephone and print media. It also analyzes statistical data obtained from a questionnaire conducted by the research group regarding communication media.]

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Introduction

"Fantasy is the impossible made probable. Science fiction is the improbable made possible."
Robert Serling, creator of *The Twilight Zone*.

Robert Serling's words hold great significance as while the genre of fantasy is all about imagining the unimaginable, science-fiction is all about predicting the future and while the genre has endured some comical failures it has also been proven to be quite accurate in some of its predictions. George Orwell first mentioned CCTV in his novel *1984* that was published in 1949. Jules Verne talked of air conditioning in his 1863 novel *Paris In The Twentieth Century*. The same man again also described scuba diving as 'portable diving kits' in his 1875 novel *20,000 Leagues Under The Sea*. Aldous Huxley's *Brave New World*, published in 1932, referred to test tube babies. And Karel Capek first portrayed the idea and coined the term of robots in his 1920 play *RUR*. These are all quite extraordinary predictions and even more so because they became a reality and with the ceaseless advancement in technology it would seem that more and more predictions made by science-fiction filmmakers will come to be true.

HG Wells wrote about an atomic bomb forty years before the atom bomb was dropped on Japan and in William Gibson's novel *Neuromancer*, published in 1984, the author envisaged the proliferation of the internet and virtual reality. In his writings regarding the concept of cyberspace, Gibson wrote, "a consensual hallucination experienced daily by billions". The author of *FutureWorld: Where Science Fiction Becomes Science*, Mark Brake, reinforced the theory that there are several hundreds of innovations first envisaged in the arts. He talks of a wristwatch that also functions as a mobile phone that will go on sale later this year. Brake said, "There is a story written by the Bishop of Llandaff in 1638 which is one of the first man on the moon stories. The protagonist goes up to the moon and meets people there and their leader uses a shell device to talk to his counterpart on earth. It's nothing to do with Nokia but the idea of using a mobile device to speak to someone is there from the 1600s"

Science-fiction filmmakers have long understood this and the employment of scientists on set to help with the accuracy of their films is becoming an increasingly popular trend. University of Manchester, Science and Communication Studies lecturer, Dr David Kirby, stated that finding scientists working in Hollywood is extremely common now. He said, "You have to have some level



of plausability or the audience won't believe it. Filmmakers consult with scientists and futurists and ask them what they think the future will look like. One example, is the Steven Spielberg film *Minority Report*. In one scene Tom Cruise moves computer files around with his hands. That is called gestural interface and it became real after the film came out. It was invented by a guy called John Underkoffler and he was approached by people who gave him the money to make it after they saw the film. It is being used by the Defence Department in the United States now." Dr Kirby also talks about the link between filmmakers, writers and scientists. He said, "The reason a lot of sci-fi looks so prophetic is because people are getting advice from scientists about what can be done. Even HG Wells was tied into the science community and in the 1950s Arthur C Clarke and Isaac Asimov were trained scientists and were in touch with scientists."

Our research group plans to further analyse the links between science-fiction film and technology throughout the following literature and come to a conclusion on the extent of which the two are interlinked.

Science-fiction filmmakers are not modern day Leonardo da Vinci's



Leonardo da Vinci was a man like no other. His inconceivable genius and versatility saw him make meticulous research in the fields of anatomy, architecture, astronomy, geography, geology, paleontology and, of course, he was a fine musician and in many eyes belongs to a small group of unparalleled artists. He designed mechanisms of flight and military war that were hundreds of years before their time. The man was capable of thinking the unthinkable and provided intelligent designs to

substantiate his ideas. He was truly unique.

Filmmakers, albeit capable of great creativity and originality, are not forecasters of the future. What may appear as innovative in a science fiction film is simply a regurgitated idea or a fictitious advancement on current technology.

Precogs in the film *Minority Report* are pure fantasy and cannot be considered science fiction as they defy one of the fundamental laws of physics – cause and effect. Dr Michio Kaku, a physicist, avows that any electron from the future is simply satisfying its own past which would

mean the electron would be unable to transport information from the future without breaking the laws of cause and effect.

John Underkoffler was one the many conceptual consultants in the ‘think tank summit’ that took place before the filming of *Minority Report*. When asked in a telephone interview with *Salon* about present day’s technology compared to that of *Minority Report*, Underkoffler replied:

“I would say a surprisingly large fraction. Almost an astoundingly large fraction. The mag-lev cars, for example. Although we don't have mag-lev technology that works on vertical surfaces, mag-lev technology has been around for many decades, spearheaded by professor Eric Laithwaite, who died not too long ago. And, of course, in Japan and Europe you have mag-lev trains. The nonlethal weapons are all variants or extrapolations of currently existing or under-development technology. It would be hard to identify anything that had no grounding in reality. I think that was very much by design.”

The distinction between science fiction and fantasy must be made. Though the idea of a half-human and half-Vulcan, a la Captain Spock in *Star Trek*, is entertaining it is not scientifically feasible and thus belongs to the category of fantasy. Only what is scientifically theoretically possible can be deemed science-fiction which as a result leaves the industry without any modern day Leonardo da Vinci’s.

Predictions of the future in science-fiction films and novels

Jules Verne’s 1865 novel, *From the Earth to the Moon*, inspired Georges Méliès to write, produce and star in a film he called *A Trip to the Moon* or more accurately *Le Voyage dans la lune*. It is a short film and was released in 1902 and went on to be a huge success with its audience. It is still regarded by many today as one of the all-time cinematic greats for its sophisticated blend of satire, science fiction, fantasy and special effects.

The film served to mock conservative science at the time with its droll opening scene featuring the astronomers and scientists discussing their mission into space and, of course, the whimsical portrayal of the moon. Many would and have argued that this film is simply fantasy, however, when one takes note of the spacecraft used to transport the men from Earth



to the Moon one will note some very accurate predictions made in space travel. Jules Verne's 'moon gun', in his novel *From the Earth to the Moon* on which Méliès based his film's spacecraft's design, was designed using actual engineering analysis.

Despite Konstantin Tsiolkovsky refuting Verne's claims in 1903, claiming a gun would have to be unfeasible in length in order to generate enough energy to support space travel, scientists in the 1960s, namely Gerald Bull, the High Altitude Research Project and NASA, found, notwithstanding some errors, that many of Verne's calculations and predictions were correct.

Verne's estimation of cost for space travel was extremely comparable to that of NASA's 100 years later. He claimed the cost of sending men to the moon would cost \$5, 446, 675 US in 1865 which was the equivalent of just over \$12 billion US in 1969. Apollo cost almost \$14.5 billion US to arrive at Apollo 8's successful mission.

He also predicted that circumlunar spacecrafts would have three crew members which was indeed the case with *Apollo 8* and *Apollo 11*. He also figured that aluminum would be the main material used to build circumlunar spacecrafts and they would have a mass of around 8,732 kilos which is not far off from *Apollo 8*'s 11,918 kilo weighing, largely aluminum, circumlunar spacecraft.

There also exist similarities between Verne's work and NASA in the launching of their spacecrafts. Verne's spacecraft left for space in the month of December and 100 years later Apollo 8 did the same. Verne's spacecraft launched from Latitude '27 deg 7 min North, 82 deg West Longitude' while *Apollo* did so at 'Latitude 28 deg 27 min North, Longitude 80 deg 36 min West. That makes *Apollo*'s launch site approximately only 210km away from Verne's. Furthermore, Verne's spacecraft landed in the Pacific Ocean at '20 deg 7 min North, 118 deg 39 min West' and was recovered by, *Susquehanna*, a US Navy vessel. Similarly the US Navy vessel *Hornet* recovered the *Apollo 8* spacecraft from the Pacific Ocean at '8 deg 10 min North, 165 deg 00 min West.

The novel and film demonstrate that what can appear as pure fantasy, with the application of measured calculations and scientific foresight, can instantly become a reality. And in a time where new scientific discoveries are continuously being made and established theories challenged, the future looks very exciting indeed.



History of the future

'Communication media' can appear to be quite broad but *Biology Online's* simple and concise definition appears most fitting to explain it. It reads, 'The means of interchanging or transmitting and receiving information. Historically the media were written: books, journals, newspapers, and other publications; in the modern age the media include, in addition, radio, television, computers, and information networks.' (Biology Online) Science-fiction films have existed for over a century and there is little doubt that numerous works have left an imprint on society. From films like *Frankenstein* and *RoboCop* that have been the influence of many a Halloween costume to *The Matrix* which has furthered the much debated notion that life may just be a significantly, complex simulation to *Star Wars* which inspired a whole new religion called, 'Jedi'. On a social level, it is evident that science-fiction films have had a major impact and one can argue that they have also had an influence in the evolution of technology.



The scene of Dr. Heywood Floyd talking to his young daughter through a videophone on 'Space Station V' in the 1968 film *2001: A Space Odyssey* was not a completely original idea. Earlier attempts at linking the telephone with television were made with the first in 1956. The test product turned out to be a bit of a disaster and the improved experimental system, 'Mod 1', in

1964 did not fare much better. The model was cumbersome, not user friendly and the screen was miniscule with the most prominent feature being the price tag. It cost a rather expensive \$125 a month and a staggering \$21 a minute to call. The people did not buy into the product and collectively voted 'No' to the *Picture Phone* as AT&T's \$1 billion loss proved.

Now though, it would be naïve to think that Stanley Kubrick's *2001: A Space Odyssey* accelerated the advancement of future videophone technology and one could argue that the film did not genuinely alter public's perception of the technology. Although the film was a huge box office success with its life-time gross at just under \$57 million and made the videophone look easy, exciting and economical (It only cost Dr Heywood Floyd \$1.75 every five minutes to call his daughter from Space), the videophone in the real world, failed to take off. Although people were impressed by the new technology it was still quite limited and many were not partial to the added intimacy offered. Seeing someone while talking to them made them feel somewhat uncomfortable.

Even today, with its much improved technology, the conventional videophone lags behind other products on the market, such as web phones, as it does not offer the economic value that others do. The present generation appears quite at ease using videophone technology, at least

when conversing with friends or family, as brands such as Skype have demonstrated with their huge success. But until manufacturers of the conventional videophone can adopt a system to make their product accessible at inexpensive, competitive rates it will continue to be a very much disregarded technology.

Radio Frequency Identity chips (RFID) is another technology that has been portrayed in films long before its widespread use in everyday life. William F. Nolan and George Clayton Johnson published the novel *Logan's Run* in 1967 which was later adapted to the big screen in 1976. The story in the film is set in the distant future, 2274, in a dystopian society where infants are implanted with a 'Lifeclock' in their hand. The 'Lifeclock' is used to determine a person's age as when one reaches 30 one is required to report to 'Carrousel' to be terminated by the state. If one does not and instead chooses to flee, 'Sandmen' are deployed to track the person down with the aid of the 'Lifeclock' device. It is worth noting that although the RFID chip was invented in 1969 and patented in 1973 the technology was already in works in other areas.



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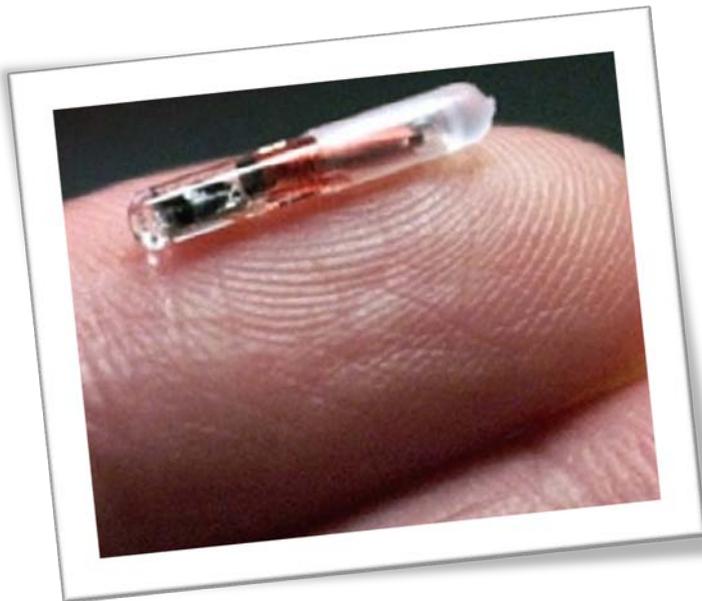
Radio waves are used to identify and track RFID chips which have been applied to a multitude of different products, animals and also humans. With regards to products, companies are choosing to use the RFID chips to increase efficiency, decrease theft or loss of property and to improve all-round management of the company. Owners are having their household pets injected with RFID chips so that they can be tracked in case they go missing. Scientists have also used RFID chips to study the behavior of animals at greater detail. Using RFID chips on ants, for example, gives scientists a much deeper insight to both their individual and collective behavior. All these practices have generally been accepted by the public. It is when it comes to implanting humans that the controversy seriously starts.

VeriChip, a company specializing in implanting humans with RFID chips, asserts that something had to be done to change the old system of identification. The company's official website mentions the events of 9/11 and how "New York firemen were writing their badge ID numbers on their chests in case they were found injured or unconscious." (VeriChip) A similar practice was, of course, performed by soldiers of the Waffen-SS in Nazi Germany during World War II where SS blood group tattoos, situated at the base of the left arm of the soldier, revealed the person's blood type through gothic-style lettering. (Wikipedia)

Albeit many lives were saved on account of the tattoos, after the war several members of the Waffen-SS were incarcerated or executed, through being identified from their tattoos, as

nations joined forces in an attempt to prosecute Waffen-SS members for a large number of war crimes. Whether or not their prosecution was justified is irrelevant here. The point is they were identified from their tattoos and similarly, many in the public sector fear that if humans are implanted with Verichips they will be exposed to unauthorized personnel extracting their information. There also exists the fear that government officials can use the Verichips to monitor everyone's every move making George Orwell's *Nineteen Eighty-Four* classic novel, and later film, of a repressive, totalitarian regime even more of a reality.

Others however, have commented on the huge benefits Verichips provide for the public. Like how tattoos provided blood type information for the Waffen-SS, Verichips could be used to provide all medical information for patients attending a hospital that are unconscious or unable to communicate. Jonathan Musher, a physician working for the Verichip company said, "With this, a quick scan back and forth across their arm could make all the difference in critical life-and-death situations where seconds count." (VeriChip)



It would appear regardless of public opinion, RFID Chips are here and here to stay. They will become more common practice in the years to come. Bars and clubs in countries like Spain and Holland have had their VIP clients voluntarily implanted with the chips. This allows the client instant access to the bar or club and a simple scan of the chip has any drinks ordered accounted for and immediately charged to the client's bank account. People will continue to argue against the security of the chips and maybe more work does needs to be done to ensure the protection of

people's information but RFID Chips will definitely play a big role in people's lives in the years to come.

In conclusion, although technology in films can appear unique and innovative there is no such thing as an original idea. Every 'new' idea has been developed from something pre-existing regardless of how closely linked the two are. A great example is the film *Minority Report* which exhibits technology that seems far beyond the realms of current possibility but in actual fact the technology for 'Personalized Advertising' and 'E-paper' is already in place. It is just a question of advancing the technology to a superior and more economical level. So although Hollywood has the ability to shock and amaze through astonishing visual effects and creative plots it really has no serious bearing on the technological advancement of science.

The evolution of science-fiction films

Here we look at some milestone science-fiction films that demonstrate how the genre has evolved. The films can be quite telling of the era in which they were made.

1902: The history of science-fiction films started with *A trip to the Moon* back in 1902. *Le voyage dans la lune* was written and directed by French filmmaker Marie-Georges-Jean Méliès. A group of astronauts are shot to the moon in a huge, bullet-like space capsule, which hits the moon straight in its right eye. While exploring the lunar surface, without wearing space suits, they encounter hostile moon people, which could be killed by striking them with an umbrella. Ultimately, they jump off the moon to get back to earth, where they safely fall into an ocean and get rescued.



1929: *The Woman in the moon* in Fritz Lang's movie sees four astronauts travel to the moon, three being men and one a woman. A scientist developed the theory, that there's gold hidden underneath the lunar surface, but it took him 30 years to realize the project. The crew had to start and also stop all of the boosters, which they almost fail to manage because of the forces of acceleration. During their voyage they discover that a little boy sneaked onto the rocket. Fritz Lang's *Frau im Mond* introduced the space suit and the countdown.

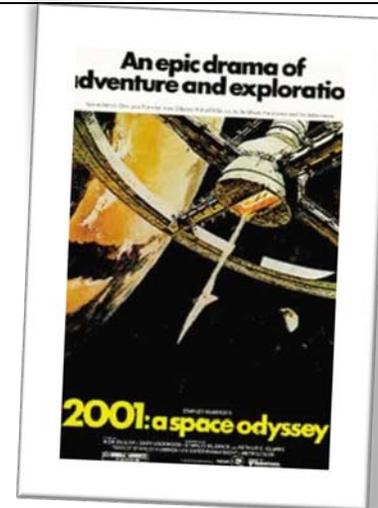
1930s-1950s: During these two decades science-fiction films were mostly Horror B-Movies that included the title *Alien Invaders*. The plot was set on earth where extra ordinary things happen to ordinary people. Humans are the victims of some kind of invasion, but they normally discover a stupid way to defeat the space invaders. (People spent 817.000.000 US-Dollar to see Independence Day in 1996. It was completely the same crap.)

1959: *Plan 9 from Outer Space* is considered to be the worst movie of all time. Filmed by Edward D. Wood Jr. the film is also known as "Grave Robbers from Outer Space", which already tells most of the plot. Aliens resurrect dead people to form a zombie army, to pave the way for the alien invasion.

1960s: The artistic part of Science Fiction reappeared in the movies of this decade. Space invaders are not the enemies in movies like *Alphaville* (Jean-Luc Godard), *Fahrenheit 451* (Francois Truffaut), *2001* (Stanley Kubrick). In these films the development of the human race is the problem.



1968: In Stanley Kubrick's 2001 a crew of five people and a computer are on their way to Jupiter. In order to save energy and oxygen, three of the group members are in hibernation. There are three protagonists aboard and awake: the scientists Bowman and Poole and the computer HAL. HAL develops his own mind and knows that he would be turned off when the error he made would be discovered.

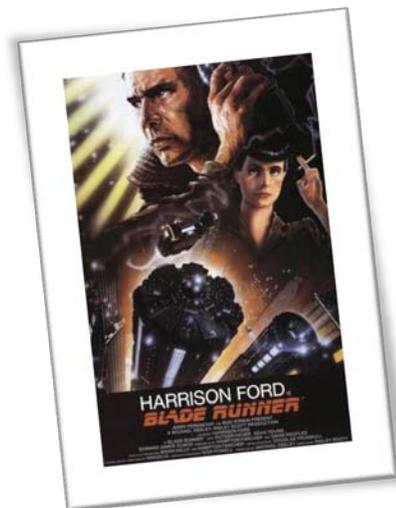


Fatal future developments as dictatorship by men or machines are a common theme in science fiction movies. Already Metropolis (1927) is a future vision of a world divided in two classes. The capitalists live on the sunny side, and the workers live underneath the surface. These predictive and preventing movies continued from the sixties. Examples: Terminator, Brazil, Matrix, Equilibrium.

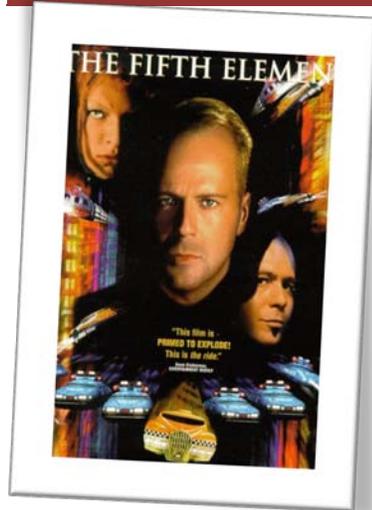


1977: George Lucas made Star Wars and took especially merchandising on a whole new level. In order to get the merchandising rights, he didn't direct Episode V (Irvin Kershner) & VI (Richard Marquand). Star Wars is much more a fantasy saga, than science fiction. The story is set in an unknown time and the plot is more like a knight's tale or a western. There is a knight, saving the princess, which turns out to be his sister, there is a desperado with a good heart, a dark knight, the death star is a fortress and the entire universe seems to be as big as the world of Zelda.

1982: Ridley Scott sets his movie Blade Runner to a not too distant future. Los Angeles in the year 2019: more than 100 million people live in this sinister city, which was known as the city of angels. Humans developed humanoid Robots, called Replicants, built for a special purpose, to do jobs humans don't want to do. A group of them escapes and a head hunter for Replicants, a Blade Runner gets the order to hunt them down. This movie is cyber punk, a dark vision of the future with no clear distinction between good and bad.



1997: Luc Besson's The Fifth Element is post cyber punk, because it uses the story elements of cyber punk but places the story in a surreal colourful and extravagant future. Instate of wearing a black leather



coat like Harrison Ford in Blade Runner, Bruce Willis is wearing an orange t-shirt.

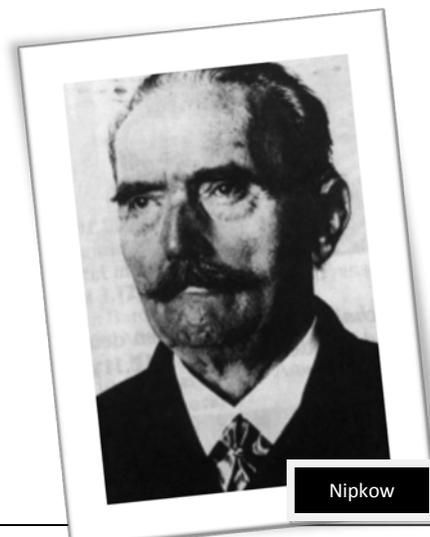
In the 23rd century the evil wants to destroy the world and the only one that can prevent the world from the apocalypse is the fifth element. Scientists manage to recreate the fifth Element, which turns out to be human being, Leeloo. Terrified of the hostile environment of the laboratory she escapes and ends up in the Taxi of a guy called Korban. The future remains unknown.

A look into Television

Nobody quite knows for sure who invented the television with Philo Taylor Farnsworth, Vladimir Zworykin and John Logie Baird being the main three credited for its creation but what is for certain is that television revolutionized the communication media world. The ability to send moving images from one location to another was a new and massive technological stride in making information accessible to all. And as with all things manmade the unremitting, innate human desire to continuously advance pre-existing technologies has awarded us with the vast array of high-definition, flat screen televisions that are now common place in society.

Mechanical Television

The first television sets sold on a commercial basis, way back between 1928 and 1934, were sold by Baird in the UK and were essentially radios with the addition of a "television device consisting of a neon tube behind a mechanically spinning disk (the Nipkow disk) with a spiral of apertures that produced a red postage-stamp sized image, enlarged to twice that size by a magnifying glass." (Wikipedia) It should also be noted that instead of relying on the back-lit silhouettes that were in use at the time, Baird, was the first to demonstrate television with 30 line images through the use of reflected light. Throughout the '20s, Baird, patented the notion of using arrays of transparent rods to transmit images for television while Clarence W. Hansell, an American research engineer, patented the idea of facsimiles. But of course, to even get to this stage took years upon years



of work from various different experts who specialized in various different fields.

On May 24 1844 the message “What hath God wrought?” was sent using dots and dashes through Samuel Morse’s first telegraph machine. It was a monumental achievement as it was the first time people in different locations managed to communicate instantaneously with one another. Alexander Graham Bell’s telephone then successfully managed to transmit speech a mere thirty years later while in 1896 Guglielmo Marconi effectively sent dots and dashes wirelessly. Reginald Fessenden was then the first in the United States to broadcast an entertainment ‘radio’ program on Christmas Eve in 1906.

Radio would go on to further develop but even before that a young man from Germany provided some serious work towards the invention of television. His name was Paul Gottlieb Nipkow and in 1884 he patented the world’s first mechanical television system while he was still an engineering student. He designed the very first television scanning device so as to put into play his concept of dissecting an image and then transmitting it in sequence. Nipkow played a pivotal role in the creation of television as he was the person who discovered television’s scanning principle, “in which the light intensities of small portions of an image are successively analyzed and transmitted.” (M. Bellis)

In keeping with mechanical television, one must not forget the fine service provided by Charles Jenkins who helped advance the technology of mechanical television in the United States akin to what John Baird did for the development and promotion of it in Great Britain. Since 1894, Charles Jenkins had promoted and researched mechanical television and he even published an article explaining a process of electrically transmitting pictures in the ‘Electrical Engineer’. He emanated from Dayton, Ohio and was an inventor who gave to the world a mechanical television system he called, ‘radiovision’. Through the system, he maintained that on June 14, 1923 he had managed to transmit the first moving silhouette images. And a few years earlier, in 1920, Charles Jenkins presented his prismatic rings, a machine that supplanted the shutter on a film projector -a significant invention that he would later employ in his radiovision system-, at the Society of Motion Picture Engineers.



Electronic Television

Developing alongside mechanical television systems were electronic television systems and the development of electronic television systems were built on the development of the cathode ray

tube. This device, otherwise known as a 'picture tube', formed part of all electronic television sets till the invention of the much less cumbersome LCD screens.

Karl Ferdinand Braun, a German scientist, invented the first cathode ray tube scanning device back in 1897. He launched a CRT with a fluorescent screen which would emit a perceptible light when it would come into contact with a beam of electrons. It was known as the cathode ray oscilloscope. A decade later in 1907, Boris Rosing, a Russian scientist, made use of a CRT in the receiver of a television system that at the camera end utilized mirror-drum scanning. Boris Rosing was the first inventor to transmit basic geometrical designs onto a television screen by means of a CRT.



The iconoscope

The year 1923 saw Russian inventor, Vladimir Zworykin, invent the iconoscope. It was a tube used in the first cameras for television transmission and although it was later supplanted, it had set the groundwork for the first television cameras. Six years later, Zworykin, then invented the cathode-ray tube named the kinescope. It was an invention that television was in dire need of.

Philo Farnsworth successfully transmitted an image of a dollar sign on television using 60 horizontal lines in 1927. He was the first to do so and he also did some pioneering work with his development of the dissector tube which still forms the foundations for all modern day electronic televisions.

Without a receiver televisions would not function to the same degree that they do and would be arguably much more expensive but thankfully, Louis W. Parker solved that problem in 1948 with the invention of the television receiver. His 'intercarrier sound system' is utilized all television receivers worldwide.

Colour Television

The RCA designed a colour television system that was authorized by the FCC on December 17, 1953 and was used for commercial broadcasting. This was the first time a coloured television system had been authorized but even before black and white televisions were in full swing the idea had already been contemplated. The first two patents filed for colour television were by a German in



The first colour television

1904 and later by Zworykin in 1925. Though both systems were unsuccessful they were they earliest attempts at turning television into colour.

The Remote Control

The now seemingly invaluable remote control also came into play in the 1950s even though Nikola Tesla had had described such a device in U.S Patent 613809 back in 1893. The first remote control to be used was created by Zenith Radio Corporation and was called, *Lazy Bone*. Though it could change channels and switch a television set on and off it was not the most efficient remote control as it was connected to the television set through a rather unwieldy cable which proved unfavourable with consumers due to safety reasons.

The first wireless television remote control was created in 1955 by Zenith engineer, Eugene Polley. It was called the *Flash-matic* and worked with the viewer using a directional flashlight to activate the four control functions that turned the television and volume on and off and also controlled the the channel tuner dial in a clockwise and anti-clockwise manner. It reacted to four photocells that were positioned in each corner of the television screen. This product was also far from perfect however, as on sundrenched days the sunlight would occasionally react to the photocells and randomly switch channels.



One year later, in 1956, Dr Robert Adler, a Zenith engineer, used ultrasonics for the basis of his new and improved *Zenith Space Command* remote control. This particular device used four almost weightless aluminum rods inside the transmitter instead of batteries. These rods, all different in length so as to produce distinct sounds that would in turn control a receiver unit fixed into the television set, emitted high-frequency sounds when hit at a specific end. Ultrasonically operated remote controls led the way for the next twenty-five years before infra-red devices took over in the early 1980s.

Plasma Display Monitors

Moving onto plasma display monitors, which although were not entirely feasible until after the dawn of other digital technologies, the world saw the first prototype invented in 1964 at the

University of Illinois by professors Donald Bitzer and Gene Slottow, and Robert Wilson who was a graduate student at the time. The aforementioned three researched plasma displays to possibly replace the cathode-ray tube-based television sets that were being used at the University in the 60s as computer monitors. The cathode-ray tube, albeit adequate for video and broadcasts, was not adequate for computer graphics as the display would require to persistently refresh. As a result of their research and hard work, the three men came up with the first display panel with one single cell which is a far cry from today's multi-million cell operating plasmas.

Plasma screens did not take off till several years later however, as although television broadcast companies did consider developing the new technology as an alternative to the cathode-ray tube a different, developing technology called, *Liquid Crystal Display (LCD)*, stifled its progress. The *LCD* made flat screen televisions a reality. The man to thank for the eventual success of the plasma display is Larry Weber. He created a prototype sixty inch plasma display which combined the size and resolution required for *High-Definition Television (HDTV)* and the much desired slim line frame.

Television Today

Today, the traditional television has been replaced. What was once an icon of western culture is now rendered obsolete. The old *National Television Systems Committee (NTSC)* -Analog television set is now virtually nowhere to be found as families and individuals have replaced their television sets with with *Digital Television (DTV)*, *Standard-Definition Television (SDTV)*, *Enhanced-Definition Television (EDTV)*, *High-Definition Television (HDTV)*, etc.



The wide variety of choice has actually made purchasing a television somewhat confusing for consumers. With so many acronyms and numbers flying around buying a television can seem like going for a physics exam. The main three television types are now *SDTV*, *EDTV* and *HDTV*. All three offer a much superior viewing experience than the analogue set but there also exists a difference in quality between the three new types. *SDTV* scans its picture in the same 480i pattern used in *NTSC* but also includes an *Advanced Television Systems*

Committee (ATSC) tuner. It's refresh rate, depending on the ratio of the screen, can be any between 24, 30 and 60 frames per second. *EDTV* uses a system displaying 480 or 576-line signals in progressive scan as opposed to the interlaced scanning system used by *SDTV* which gives it a better picture quality. It is not however, as good in quality as *HDTV* which offers resolutions comprising of 720 lines or 1080 lines on a 16:9 aspect ratio. *HDTV* has completely changed the way we watch television. It's picture is so sharp and clear that when watching a football match it almost feels as though you are there in the stadium with the fans cheering your team on.

The evolution of the television has been moving at a remarkable rate in the last decade and it obviously promises for an exciting future ahead. What was once seemingly impossible now seems more than attainable. One can look back at films of yesteryear and remember how one was absolutely astonished with the futuristic technology portrayed and yet now find it to be widespread across the community or in the process of becoming so.

Films and the future: Television

Total Recall

The 1990 film *Total Recall*, starring Arnold Schwarzenegger and Sharon Stone, and directed by Paul Verhoeven displays some wonderful visions of the future. The film, set in 2084, shows Douglas Quaid (Schwarzenegger) telling the robotic cab driver to "Just drive!" but he will not as he requires a destination before

he can set off. There is, of course, also the idea demonstrated that interplanetary travel will also be possible but what is most interesting, for this article at least, is the film's vision of television. The opening scene of the film sees Quaid watching the news, concerning trouble on Mars, on a rather large screen that is seemingly fitted into one of the wall's panels. However, when his wife, Lori, enters the room she switches the news off with a remote control and a moving image of a forest and river suddenly appears covering three of the wall's panels thus meaning the film predicted large, wall size, interactive television sets in the future.



We may be 74 years away from the film's future setting but we already have the technology displayed in the film and have bettered it. *Panasonic* have come up with a gargantuan, interactive television that is indeed the size of a wall and they are quite appropriately calling it *Life Wall*. It displays a 2000-by-4000 pixel resolution and is 150-inches long. The company has produced a product whereby the user can not only watch tv but also surf the internet, read emails, play sports, listen to music, practice playing music and even see who's rung the doorbell! *Panasonic* President Toshihiro Sakamoto said, 'It's capable of an amazing picture that is four times the resolution of our current full HD plasma TVs.' Furthermore, if you're watching



a program and move away from the wall the screen size of the program you are watching will expand and decrease again if you go closer to it. It is a touch screen, of course, and can also act as an interactive wallpaper. The television will not come cheap with prices estimated in the tens of thousands of dollars but it should be available for consumer purchase by the end of the year. Sakamoto went on to say, 'My dream is to replace one whole wall in your business community,

environment or even your home with Life Wall.' He then concluded, 'We believe the focus of our industry should be to enhance the human experience by bringing people together around a whole new kind of digital hearth, one that goes far beyond the boundaries of our living rooms, a place that enables new ways to learn, laugh, communicate and interact, not just with friends and family, but with new friends all around the world.'

Panasonic clearly has a strong vision for the future whereby through its innovative creations it will continue to break down the walls that block us and increase our prospects of connecting with one another. Interestingly as well, is the evolution of the television. With studies showing an increasing number of the younger generation opting to watch television programs online rather than through the actual medium of television could a product like the *Life Wall* swing consumers back to the medium?

Back to the Future 2

Back to the Future 2 is full of future predictions and it features some interesting forecasts regarding television. The film is directed by Robert Zemeckis and stars Michael J. Fox and Christopher Lloyd in a future completely different to the world they know back in their own present time of 1985.

The future scenes of the film are set in 2015 and in one scene, Marty McFly Jr, goes home and turns on six channels simultaneously on his large, flat screen television. This, naturally, was absolutely impossible in the 80s but has now become a common, or at least very possible, phenomenon. The channel index in the top left hand corner of each of the six mini screens runs into the hundreds signifying an endless amount of channels. Again, this was very far from reality back in the 80s as the majority of people had cable boxes which were extremely limited in the amount of channels they had to offer by comparison to today's standards. Today, networks have multiple sister channels devoted to one particular channel brand. Cases in point would be *Nickelodeon* which is now broadcast over five channels these being *Nicktoons*, *Nick 2*, *Nick Jr*, *Teen Nick* and *TV Land* and *MTV* has an extensive list of sister channels with just a few of these being *MTV Italy*, *MTV 2*, *MTV Hits*, *MTV Jams*, etc.



Along with flat-screens now being popular so is watching multiple channels simulatenously. Like Marty McFly Jr, one can easily watch more than one channel at the same time through a simple click of the button on one's remote control. *SkySports* for instance, offers its viewers the opportunity to watch all eight *Champions League* group games simulatenously on their television screen.

In another scene, Marty McFly, holds a video conference with his colleague Needles. Video conferencing appeared to be a big and exciting vision of the future in the past as it features in various other science-fiction films, *2001: A Space Odyssey* to name one, but as is most evident it simply has not taken off. Though accessibility is high due to anyone with a computer being able to afford a webcam people still tend not to use the device. Instant Messaging applications, such as *MSN* and *Skype*, are still more commonly used on a textual basis. It seems most people do not feel comfortable being seen themselves or being seen by the person they are talking to. Reasons vary from poor lighting and camera angles to a certain amount of effort that must be put in so as to look presentable. So despite being correct in its prediction video conferencing use simply has not escalated to the point most thought it would and barring a complete reform of the system it will probably remain that way.



Watching television through a personal head set is another appealing prediction demonstrated in the film. Marty Jr. and Marlene both watch television through personal pairs of television glasses. By simply placing the glasses on their heads they can watch any television program they desire without disturbing anyone else around them. And the filmmakers kind of got this one right too as the product does indeed already exist. There are various different models obtainable from different brands but one that particularly stands out is the *Rimax Virtual Vision Glasses 3.0*.

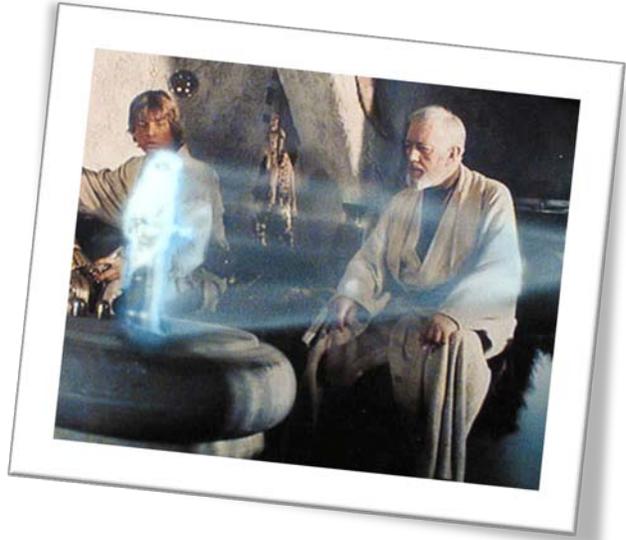
The *Rimax Virtual Vision Glasses 3.0* is a device worn on an individual's head whereby the individual can watch films or other content, listen to music and/or play video games. Inside the device is a mini LCD display through which an optical system is implemented which gives the viewer the illusion of watching a 36-inch screen from two meters away. Audio is heard from a pair of earphones that fix into the individual's ears.

These types of products were unsuccessful in the 90s due to being huge in size and even more so in price, however, with the technological advancements they are becoming more popular especially so in gaming as they offer the immersion experience. The video glasses, also known as personal media players and head-mounted devices, are a niche product as an individual wearing the glasses cannot really interact with the real world while doing so. However, the video glasses have had some success with people travelling long distances such as on planes or trains. The device has also had relative success in parts of Asia where frequent tube users were annoyed at having people look over their shoulder to see what they were playing on their iPod.

The main reason video glasses have not shared the same success as other products such as the iPod is that they are not portable enough. Michael Gartenberg, research director of *JupiterResearch* in New York said, 'For now, iPods and computers are good enough for most people.' There's also an issue with comfort. Wearing the video glasses for more than an hour can cause some disorientation and discomfort as the device compels one to focus one's eyes closer together than normal. Intense viewing can also lead to an individual losing his or her balance. So for now the jury is still out on this particular device. Further technological advancements needs to be made to make it more user friendly and perhaps, fashion needs to catch up with the look that it offers as now one looks rather out of place when wearing a pair.

Star Wars: A New Hope

Star Wars, what many would consider to be the mother of all science-fiction films, is another film title which is very relevant to this article. In *Star Wars: A New Hope*, written and directed by George Lucas and starring Mark Hamill, Harrison Ford, Carrie Fisher, Peter Cushing and Alec Guinness, viewers were treated in one scene, to a holographic message that was delivered by Princess Leia Organa to Luke Skywalker and Ben Obi-Wan Kenobi. Holographic images were pure fantasy when the film was released in 1977 however, they are now a reality.



In 2007 *Cisco* CEO John Chambers “beamed up” Senior Vice President of Emerging Technology Group at *Cisco*, Marthin de Beer, and General Manager of the Telepresence Business Unit, Chuck Stucki, at an “On Stage” telepresence experience demonstration in Bangalore, India while the two were in San Jose, United States of America. The image of the two men was incredibly realistic as they interacted with John Chambers and presented the new technology to a live audience both in the auditorium and through a live online feed broadcast around the world.

The demonstration was made possible through uniting the *Cisco Human Network* that connected San Jose and Bangalore with the specially high-definition camera and codec technology that powers the *Cisco TelePresence* and the telepresence display technology of the United Kingdom company *Musion*. It worked through a *Musion* patented, transparent Eye-line foil which was fixed athwart the rostrum. The specially high-definition images of Marthin De Beer and Chuck Stucki were then captured in San Jose and the images of the virtual humans were then conveyed over the *Cisco Human Network* to be presented in Bangalore.

Despite this not actually being holographic television they are considered monumental steps towards the future development of it. An updateable 3D display was created by the University of Arizona in 2008 which is considered to be a revolution in the technology. The display was limited as it could only be updated after a certain amount of minutes which would not be adequate for holographic television as it would need to be updated multiple times per second but it is another step in the right direction to what is seemingly the inevitability of holographic television.

In Conclusion

Television is perpetually evolving as demonstrated through this article and what was once seen as pure science-fiction, in many cases, has become a reality. It has changed the way we live completely and with its own further changes we, as a people, will no doubt change with it. Johnny Carson once said, 'If it weren't for Philo T. Farnsworth, inventor of television, we'd still be eating frozen radio dinners.' The film industry has undoubtedly contributed to the evolution of the medium. It is no secret that most film directors employ the assistance of scientists and other experts to use their foresight of the future as an aid for the composition of a scene. However, a strong argument can be put forward that thanks to an exceptional level of creativity and quality execution, the film industry has encouraged many a young man to step into the field of science and attempt to achieve the unachievable.

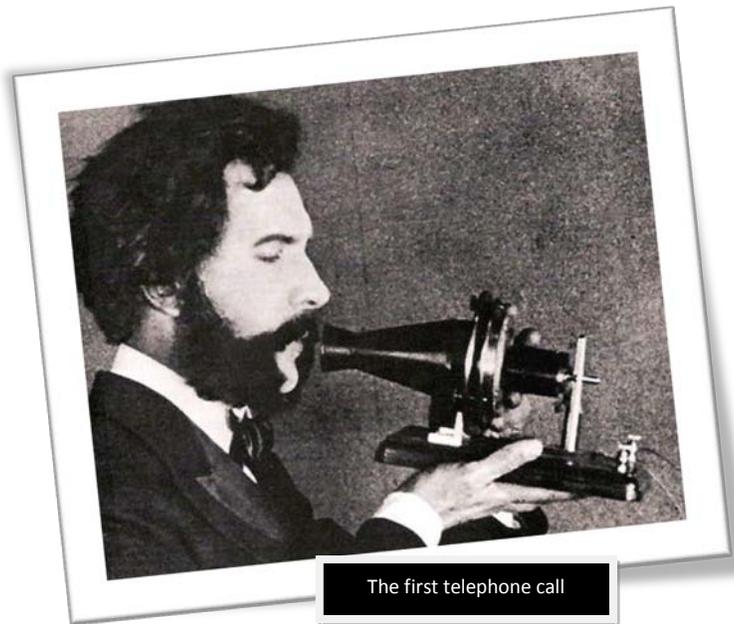
A look at the Telephone

A cell phone might soon be your best friend. Several technological improvements with the cell phone have been introduced every year. Ten years ago your cell phone could call or send a text message and receive both. Now your cell phone is a desktop computer. What will it be in 10 years? Or one thousand million years?

140 year old telephone is a telecommunications device that transmits and receives sound, most commonly the human voice. It has been and is one of the most common household appliances in the developed world, and has long been considered

indispensable to business, industry and government. Telephone has changed the ways people exchange information and communicate in their everyday lives, by making it easier, faster and cheaper. The word "telephone" has been adapted to many languages and is recognized around the world.

Credit for the invention of the electric telephone is frequently disputed, and new controversies over the issue have arisen from time-to-time. As with a lot of great inventions such as radio, television, light bulb, and computer, there were also several inventors who did pioneering



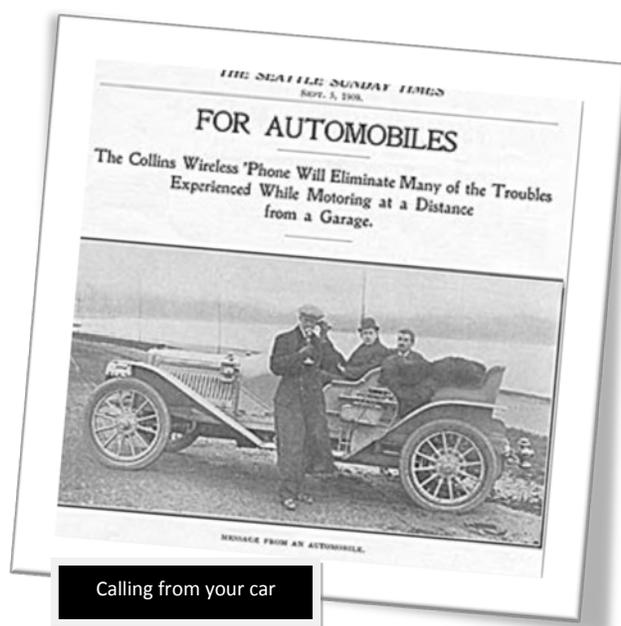
The first telephone call

experimental work in the field of voice transmission over a wire and improved on each other's ideas. Innocenzo Manzetti, Antonio Meucci, Johann Philipp Reis, Elisha Gray, Alexander Graham Bell, and Thomas Edison, among others, have all been credited with pioneering work on the telephone. Alexander Graham Bell was the first to be awarded a patent for the electric telephone and is often referred as the inventor of telephone. Alexander Graham Bell issued his patent for a voice transmitter on February 14, 1876. The same day Elisha Gray issued a caveat (the right for a future patent) for the same invention. If Bell developed or stole the idea, which lead to the most valuable patent in history, remains unsolved. 5 years earlier, Antonia Meucci issued a caveat for a voice transmitter, but couldn't effort to pay 10 USD in 1874 to renew his invention.

Future of telephone is an exciting and interestingly cool unpredictable future, or is it? Is there a way of finding out? do we have to wait ten whole years to discover this? Is there an alternative way? perhaps some sort of weird machine that can bend the fabric of space and time and allow us to visit the future and give us answers? how long will it take for COMMUNICATION TECHNOLOGY to evolve to this state? if you're going to harm yourself because your uncertain that you can wait ten years or are planning a journey in time: hold your horses! You have to wait no longer if it is up to us! We: Jan, Douglas and Chris here at Crossmedialab's top secret J.U.M.P (van Halen unrelated) research team are all about researching the history and the future of communication technology by using science fiction films and providing you the answers you used to seek from religions or drugs or unprotected sex or whatever or did you?

The wireless telephone

A mobile phone or cell phone is a device used for mobile telecommunications (mobile telephony, text messaging or data transmission) over a cellular network of specialized base stations known as cell sites. Today modern cell phones are also used as a tool for searching information, as a notebook, computer, camera, portable music device, compass, map, bottle opener and much more. Cell phones are not a new idea at all. In 1908 first patent for a wireless telephone was issued to Nathan B. Stubblefield.



The first fully automatic mobile telephone system for cars was created by the Swedish companies TeliaSonera and Ericsson in 1956. The Mobile System A (MTA) was the first such system using the public telephone network. It was replaced by the Mobile System B (MTB) which used transistors to improve the capacity and reliability. The system had a bandwidth of 30 kilometres. The first mobile phones weighted around 40 kilos, consumed most of a cars trunk and cost

about 7000 Euros.

The first commercial fully automated cellular network (the 1G generation) was launched in Japan by NTT in 1979. The initial launch network covered the full metropolitan area of Tokyo's over 20 million inhabitants with a cellular network of 23 base stations. Within five years, the NTT network had been expanded to cover the whole population of Japan and became the first nation-wide 2G network.

NMT (Nordic Mobile Telephone) system was launched in Finland, Denmark, Norway and Sweden in 1981. NMT was the first mobile phone network featuring international roaming. In wireless telecommunications, roaming means the extending of connectivity service in different locations. Basically it's the ability for a cellphone user to automatically make and receive voice calls, send and receive data, or access other services when travelling outside the coverage area of the home network, by means of using another network.

The modern mobile phone

2G - Digital mobile communication

The first modern network technology on digital second generation cellular technology was launched by Radiolinja in 1991 in Finland on the GSM standard. GSM has digital signaling and speech channels and because of this is considered a second generation (2G) mobile phone system. This allows data communication built into the system for example the short message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well. It is the most commonly used data application on mobile phones, with 74% of all mobile phone users as active users (over 2.4 billion out of 3.3 billion total subscribers at the end of 2007). SMS text messaging was worth over 100 billion dollars in annual revenues in 2007 and the worldwide average of messaging use is 2.6 SMS sent per day per person across the whole mobile phone subscriber base. 2G also introduced the standard worldwide emergency telephone number, 112. This makes it easier for international travellers to connect to emergency services without the need to know the local emergency number.



The first data services appeared on mobile phones starting with person-to-person SMS text messaging in Finland in 1993. First trial payments using a mobile phone to pay for a Coca Cola vending machine were set in Finland in 1998. The first commercial payment system to mimic banks and credit cards was launched in the Philippines in 1999 simultaneously by mobile

operators Globe and Smart. The first content sold to mobile phones was the ringing tone, first launched in 1998 in Finland. The first full internet service on mobile phones was i-Mode introduced by NTT DoCoMo in Japan in 1999.

3G - Increasing bandwidth

As 2G networks were built mainly for voice services and slow data transmission new third generation cell phones allowed faster data rates and thus more versatile platform for new applications. 3G is a family of standards for mobile telecommunications defined by the International Telecommunication Union (ITU). It has defined a minimum data rate of 2 Mbit/s for stationary or walking users, and 384 kbit/s in a moving vehicle for 3G. However the minimum or average data rates or what modes of the interfaces qualify as 3G are not clearly specified, so various rates are sold as 3G intended to meet customers expectations of broadband data. The first pre-commercial 3G network was launched by NTT DoCoMo in Japan branded FOMA, in May 2001 and 3G offered a wide range of new applications. These applications were mainly made possible due to the enhanced data rates and more advanced technology in third generation cellphones: browsing internet, checking your e-mail, gps etc.

In many countries, 3G networks do not use the same radio frequencies as 2G, so mobile operators must build entirely new networks and license entirely new frequencies. This resulted as delayed launching and huge economical costs. In 2009 the number of 3G users has doubled in the leading telecommunication countries. The number one in total and per capita usage is Japan with more than 100 million 3G users it has a penetration of 90 percent. Number 2 are the USA with 67 million users and South Korea with 53 percent 3G share. Italy is the European leader with more than 30 million 3G users.

4G - Where are we now?

Bandwidth requirements for 4G (which is 1 Gbit/s for stationary and 100 Mbit/s for mobile operation). A 4G cellular system must have target peak data rates of up to approximately 100 Mbit/s for high mobility such as mobile access and up to approximately 1 Gbit/s for low mobility such as nomadic/local wireless access, according to the ITU requirements.

The Mobile Phone

Although mobile phones were already used shortly after World War II, it took two more decades to show the first prototype of the future's mobile phone. A phone that's so small and light you could carry around with you and not consuming as much power, that you need a car battery to run it. In 1973 Motorola presented the first cell phone prototype.



This prototype version wasn't too handy, weighting almost a kilogram. It took Motorola ten more years to come up with a commercial version of the cell phone. In 1983 the DynaTEC entered the market and it weighted just half a kilo. It wasn't just for Motorola a milestone...



Nokia presented their first mobile phone in 1982, but the Mobira Senator didn't really look like anything we would consider a mobile phone by today's standards. It weighted almost 10 kilograms and had the size of a patrol can.

In 1993 Nokia presented the 2110 which introduced the soft keys and the UP and DOWN button, what revolutionized the usage of cell phones. The early Nineties invention of text messaging changed the use of cell phones, especially of their buttons. Menus became simpler and easier to handle, with the cursor.

From the early nineties on, the success of GSM Phones revolutionized not just the market, it revolutionized the society. In 1993 it was predicted, that by the end of century, there's going to be a 100 million cell phone subscribers, but it took just till 1996 to reach this point. The cell phone speeded up the society and created a whole new way of communication, with more than 4 billion cell phone subscribes. 2003's release Nokia 1100 is with more than 200 million units the top-selling cell phone in the world, in 2007 is pushed the Nokia 3310 from the throne.

The Smartphone

There were always phones that could do a little more than others. In the late nineties, a cell phone was pretty good, when it had full-graphic monochrome display and could hold like 160 text messages. By today's pretty good phone standards, it has a display and camera resolution, as a 10 year old TV and a 5 year old digital camera; as much processor speed, RAM, Memory as 10 year old High-End-PC and a Touchscreen.

There are several definitions, of what a smartphone makes a smartphone.

"A large-screen, data-centric, handheld device designed to offer complete phone functions whilst simultaneously functioning as a personal digital assistant (PDA)." (Analyst house Gartner)

The first Smartphone: The Nokia Communicator

In 1996 the first smartphone was introduced, the Nokia 9000. It weighted almost 400 grams and had 8 MB of memory. You could flip it open and you had a full QWERTY keyboard and a quite big monochrome screen, you could even flip the antenna. Closed, it looked like a



regular cell phone, just the shape and the size of brick.

Today's smartphones are PCs you can call with and they seem to be the next battle field of the big companies in the computer business.

The iPhone competitor



3.7" AMOLED Touch Screen Display
(800x480), 1 GHz CPU, 5 Megapixel
Camera, Android 2.1,

Google, the company you know just from the virtual world, with products like their search engine, the android OS, google maps, google chrome and most recently google wave. Google will soon become real. Pretty soon you will be able to hold it in your hands, put google in your pocket, posses some real world google.

Early next year google will lunch its own smart phone. Last year they presented the google android, a smart phone OS, which is apple's only real competitor so far. Now the go a step furdur, rumors say: already in early january google is going to sell the Nexus One. It's a phone similar to apple's iPhone, with a slightly larger touchscreen, the new android 2.1 OS installed, a 5 megapixel camera and some other interesting features.

Google employees were the first ones to get some test versions of the Nexus One.

It could be considered a war declaration to apple, that google enters the smart phone market, with a similar product and spreading the rumours right before Christmas.

Films and the future: Phones

Star Trek (1966-1969)

The Star Trek Communicator is probably the most famous phone like devices in the science fiction history. It is a very simple device that could be flipped open and used as voice transmitter. It is not a very visionary product and looks now, 40 years after the series is shot, anachronistic. More like past than future. Other than a mobile phone, the communicator has to work in outer space and distant planets, which you could explore without wearing space suits. On these planets you couldn't operate a mobile phone, because of the missing infrastructure and enormous roaming costs. So for the few operating communicators aboard of spaceships of the enterprise-class, primary communication is the only, but very important duty.



The Fifth Element (1997)

The fifth Element is still the most expensive and successful European film. Made in 1997 and set in the 23rd century communication technology is not very advanced or futuristic. Bruce Willis is using a cell phone like device, which is the size of a 1997 cell phone and includes the multi-functionality of a 1997 cell phone. With its massive, rectangle-shaped black body, the phone fits into the post cyber punk setting of the movie.

2001: A Space Odyssey (1968)

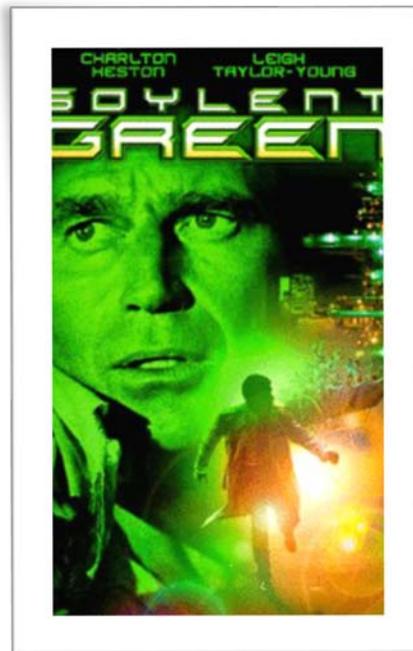
In the second (of four) part of this movie, a scientist is travelling to moon, where a great excavation was made. On his way to moon, he's stopping over at a space station, where he is calling his daughter from a phone booth. The call includes a transmitted real time picture of the called person, a video call. The call fees are charged from his bank account.

This vision of video call is very accurate and realistic, just the appearance of the used devices seems to be a bit outdated. The scenario of a lounge-like space station, run by the United States and the Soviet Union in 1999 (the second part of the story is set in 1999 and the third in 2001.) was a bit too optimistic. The book and the film 2001 were a simultaneous project by Arthur C. Clarke and Stanley Kubrick. Realized in the sixties, the decade John F. Kennedy promised an American Astronaut will set foot on the lunar surface, the perception of space travelling was certainly more optimistic.

Soylent Green (1973)

In the year 2022 the world is in serious condition. Space and Food is short, the poor live in slums and the rich in ghettos. Charlton Heston is a rather corrupt policeman, investigating the murder of rich man. A woman, which is part of the apartment (in good apartments, women are part of the inventory) helps him investigating in this case, in which many influential men are involved, hiding a terrible truth.

Charlton Heston, as a policeman, has access to "public" phones. These phones are in locked cases on walls. Just people with the right key can use them. So this public phones aren't even public. This film doesn't predict a well developed consumer electronic industry, so it might not apply to our current situation.



Back to the Future II (1987)

Also Marty's son, who looks exactly the same as him is a disappointing coward, something that proud Marty can't take. Also his future ego is not very successful and there are many more

problems in his future family. That's what Marty's past ego has to discover, when he travels to the year 2015. Future Marty is still as immature, as he has always been and can't help himself from screwing up his own future, because he's called a Chicken.

The conversation leading to the screwing up Part happens not in face to face as in the past, it is a video phone call and a credit card payment from his own living room, making him a criminal. This film predicted video calls over your home flat screen TV, which is an extraordinary accurate prediction.

In Conclusion

The films we've watched and the examples we've picked, include video calls which were already science when those films were made, so it wasn't science fiction anymore. But all of them failed to predict the current importance and appearance of highly developed cell phones. In none of these films the cell phone is as omnipresent as in our contemporary society.

A look at Print Media

Print defines a technique, not the medium. Printing is known for ages and was already used in Egyptian empire in the fourth century. The technique is very simple, just a printing plate, something to print on (e.g.: paper) and some sort of colour (e.g.: ink) is required. But we are going to start our short trip through the history of printing in 15th century's Europe, in the last days of the dark ages.

A man called Johannes Gutenberg printed around 180 bibles in the early 1450's and changed the world forever. Before that, bibles were copied by hand, manufactured by monks. Not many people could afford to buy them and not many people could read at all. Because printing plates used before were made from wood, they weren't long lasting. Gutenberg was a goldsmith and could use his knowledge of metals, to make long lasting printing plates. But that wasn't real inventive part, instead of making whole plates he started to manufacture single, movable letters.



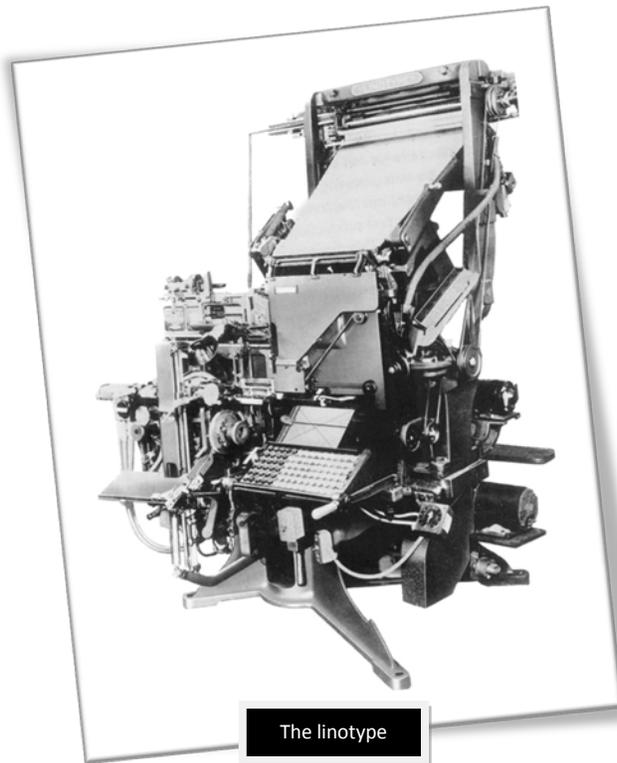
What Gutenberg did for the technique of printing, another German did for the change in society. Martin Luther founded Protestantism, leaning up against the catholic reign. In 1517 he nailed 95 theses on the door of the church in Wittenberg, which led to his excommunication from the catholic community and the schism between catholic and protestant church. Besides

the dictionary by the brothers Grimm, the Luther bible is the most important achievement for the written German language. Countries which turned to Protestantism improved their literacy rate disproportionate, e.g. England's literacy rate rose throughout the 16th century from less than one percent to almost 50.

The modern era of news printing began in the early 17th century. The first periodical newspapers were issued in continental Europe. The invention of movable letters made it possible to print "news" on regular bases. It started 1605 in Strasbourg, which is now a part of France, back then was a part of the Holy Roman Empire. The newspapers spread quickly over Europe. Bavaria, Netherlands, England, France and Sweden were the next countries to issue their own newspapers, by the end of the century newspapers reached North America.

The industrial revolution had its impact on the newspapers. Faster printing machines, which could print paper on both sides the same time, were invented in the early 19th century and made the newspapers more affordable.

The rotary printing press was invented in 1843 by Richard March Hoe. Paper didn't have to be printed sheet per sheet it could be taken from an almost infinite roll paper roll and revolved around a cylinder which held the negative. Printing machines had to just revolve, instead of doing several mechanical movements for one copy. The rotary printing press is still used for mass printing.



The linotype

The linotype machine was invented in 1884 by Ottmar Mergenthaler. This invention is considered the most important invention in print since Gutenberg's printing press. Before the linotype machine hit the market, newspapers didn't have more than 8 pages, because every letter on a page had to be set by hand. This machine had a keyboard and every key was connected to a letter, every letter had a code. Instead of setting a text by hand, it just had to be typed and the machine was setting the text.

Throughout the 2nd millennium print got more diverse. Newspapers, Magazines and other forms of print products entered the market. The literacy rate in

the developed world reached almost 100 percent. Capacities and distribution improved. Costs and retail prices sank. Print got colourful. Ink was replaced by digital print. Newspaper penetration reached its peak in the developed countries. In some countries almost every household read at least one newspaper.

Print came to Europe in the medieval and was the invention to end this Dark Age. Print brought the Renaissance which changed Europe in the late 15 and the early 16 centuries. The invention of the printing machine, Johannes Gutenberg, is considered the most important invention of the second millennium. Throughout the second half of the second millennium, print was improved in many ways but even though the paper and the ink had improved and changed, and gained colour and was printed faster, better and more cheaply, the original idea remained the same.

But in the 1990 the traditional print got an online competitor, the internet. Almost every offline newspaper got its online version or a website with additional content. Also free newspapers entered the market at the end of the 20th century in a big style.

The E-Paper

The most serious threat for ink and paper has a very short commercial history. In 2006 the first e-readers were issued. Those devices work with e-paper and e-ink. Their displays are much more similar to real paper and ink, than to computer or cell phone displays. Working without backlight and a steady imagine. E-paper is still monochrome. Full-colour-displays or displays with a reaction time, fast enough for internet application are still in development. The biggest advantage of e-paper, compared with normal screen, is that image is steady once a page is generated. So it needs almost no energy, because the e-ink stays in the place it was set. It got the advantage of real paper that it just the reflecting light on the surface, so it's better to read.

The battery for the Amazon kindle, the momentary market leader, lasts for two weeks.

Next year apple will probably release the iTablet. Not just a larger version of the iPod touch. It will be a Mac, PDA, eReader, MediaPlayer and Phone in one device.

Print's selling proposition is that the media is the message in a literal way. Other than the media which unique occurred in the 19th century: phone, storable music, film; where content and medium are two separate things. In print the content is bound to the medium.

The e-book market is dominated by Amazon, but apple will probably hit this market too. Apple could sell books the way they sell

mp3s, an iTunes for books. Insiders think the plan could pay out, because the publishers don't like Amazon, because they keep 50 percent of the profit, apple think of sharing 30/70.



Amazon's latest version of the kindle with a 9,7 inch display.

Films and the future: Print

Minority Report (2002)

In the movie *Minority Report* is an example for an e-newspaper. The appearance is like a normal newspaper, but with moving, colour images and self updating. When the police was looking for Tom Cruise, you see the page changing and breaking news appear, with a picture of the suspect.

2001: A Space Odyssey (1968)

In the movie *2001: A Space Odyssey*, newspapers are transmitted to the crew in outer space. Two wake astronauts and one artificial intelligence separated from earth by hundreds of millions of kilometres. To keep up to date with developments on earth, they're reading earthly newspapers from computer screens aboard. Those e-newspapers are just a scan of the normal issues. So also this Film failed to predict an invention as the internet, where newspaper's content is not longer bound to paper, but on the other hand many newspapers sell now the printed issues as PDFs. So this film was maybe ahead of its future prediction of the past.

In Conclusion

In the movie *Back to the Future II* is an example of a flat screen TV, which looks like those we have now, there is an example for holographs and a newspaper. While everything is ahead of it's time, the newspaper is still completely the same. That illustrates pretty good how print is perceived in Science Fiction. Print was analogue and unplugged, that is maybe the reason why it didn't appeal to science fictionous minds, writers, directors in the history of the future. But on the other hand, traditional print is still very popular and there will be still printed issues of newspapers in the year 2015. So maybe science fiction managed to make the right prediction or science fiction failed to influence the future of print.



An analytical look at the future of Print

George Orwell said, “Early in life I had noticed that no event is ever correctly reported in a newspaper.” (Famous Quotes) His comments may hold substantial truth as newspapers have been criticized for inaccurate and biased reporting since their inception, however, now as the world further engulfs itself in the new digital age where anyone with a computer can form an



opinion and make it accessible on the web, is the newspaper industry, more than ever before, our most reliable source of news? The answer is a resounding ‘yes’ thus making it one of the fundamental questions the world faces as the future of the newspaper industry plunges into further doubt as a result of the unrelenting success of the internet.

The ‘Newspaper-Web’ war is rather reminiscent of the 1930s conflict between newspapers and radio in America. Like now with the web, the newspaper industry considered radio to be a threat to the morality and ethicality of journalism. Gwyneth L. Jackaway, author of *Media at War: Radio's Challenge to the Newspapers, 1924-1939* wrote, “Radio journalists, they warned, posed a threat to the journalistic ideals of objectivity, the social ideals of public service, the capitalist ideals of property rights, and the political ideals of democracy.” (Shafer, J) Newspapers withstood the oppositions of new media in radio and later television but the internet offers a much stiffer challenge to its established media. The internet offers news instantaneously. It can devote unlimited space to an article and provide additional links to related stories while also providing what is now considered invaluable user interaction to comment on stories. Thus many advertisers are switching their attentions to the internet causing newspapers to lose their primary source of income. The newspaper industry needs to adopt a new strategy to fund its very own survival.

Government funding to bail out newspapers, in democratic nations, is not feasible as it would be subsidizing organizations that act as regulators to itself. This in turn could provoke subservience and dependency in reporting which defeats the whole purpose of the journalistic profession. Communications and Public Affairs Professor Paul Starr of Princeton University said, “Many Americans would be more comfortable seeing support for journalism come from a great variety of private philanthropic sources than from the government.” (Curl, J) This proposal would ensure that freedom of speech is more inclined to be maintained.

‘Micropayments’ is a concept that has been discussed with regards to saving newspapers. In a speech entitled, *A Bold, Old Idea for Saving Journalism*, at the University of California Riverside, Walter Isaacson said, “The key for attracting online revenue, I think, is coming up with an iTunes-easy, quick micropayment method. We need something like digital coins or an E-Z Pass

digital wallet – a one-click system that will permit impulse purchases of a newspaper, magazine, article, blog, application, or video for a penny, nickel, dime, or whatever the creator chooses to charge.” (Etheridge, E)

The idea is to create a system where a user pays a low sum of money that can be considered so insignificant it does not inconvenience the user while the company benefits financially through mass public usage. Isaacson continues, “Under a micropayment system, a newspaper might decide to charge 2¢ for an article, or a dime for that day’s full edition and website access, or \$2 for a month’s worth of editions and web access. Some surfers would balk, but I suspect most would merrily click through if it were cheap and easy enough. Subscribers to the physical version of the paper could get the online version for free.” (Etheridge, E)

However, there are various who do not believe this concept can work. Clay Shirkey, author of *Here Comes Everybody* and writer of the essay *Fame vs Fortune*:

Micropayments and Free Content, deems micropayments “a pointless response” to “an epochal change” of freely accessible content. He cites what Nick Szabo calls, ‘mental transaction costs’, which is the

energy required to choose whether or not something represents value for money, regardless of its cost, as one of the main reasons why this concept would fail. He states that by simply lowering the price of the product the ‘mental transaction cost’ does not diminish and furthermore adds that ‘mental transaction costs’, beneath a certain threshold, rise in actuality as, “It’s easy to think a newspaper is worth a dollar, but is each article worth half a penny? Is each word worth a thousandth of a penny? A newspaper, exposed to the logic of micropayments, becomes impossible to value.” (Shirkey, C)



Another issue raised with micropayments is that regardless of how little is charged for content because similar content is freely available and easily accessible elsewhere potential readers will be deflected. The internet has provided a digital platform for people without a publisher to be published at no cost. Despite not earning money for their contributions they are gaining publicity which is what many creative people desire and this is having a direct damaging effect on newspapers.

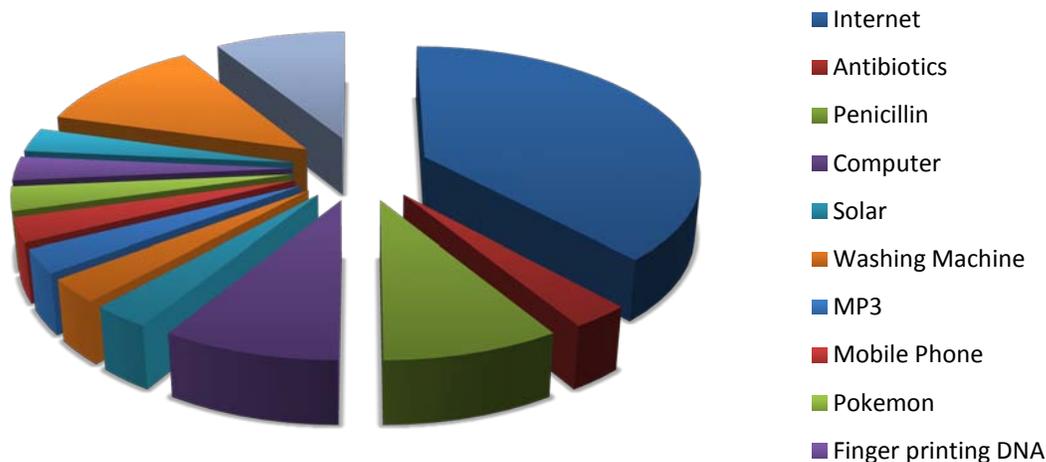
At the moment, nobody knows for certain where the future lies for newspapers. Maybe the paper newspapers are written on will one day cease to exist but in order to survive major news organizations are going to envisage new practical strategies to cope and compete with the seemingly implacable internet. As important as the internet is to serve as a platform for the

people to freely express their ideas and opinions the newspaper industry is a vital cog in society's evolutionary wheel to serve as a watchdog over the elite. It was President Obama who last year said to Pittsburgh Post-Gazette, "I am concerned that if the direction of the news is all blogosphere, all opinions, with no serious fact checking, no serious attempts to put stories in context, that what you will end up getting is people shouting at each other across the void but not a lot of mutual understanding." (Curl, J)

The Internet

"THE INTERNET? BAH!" (NEWSWEEK headline in February 1995)

What do you think was the greatest invention of the 20th century?

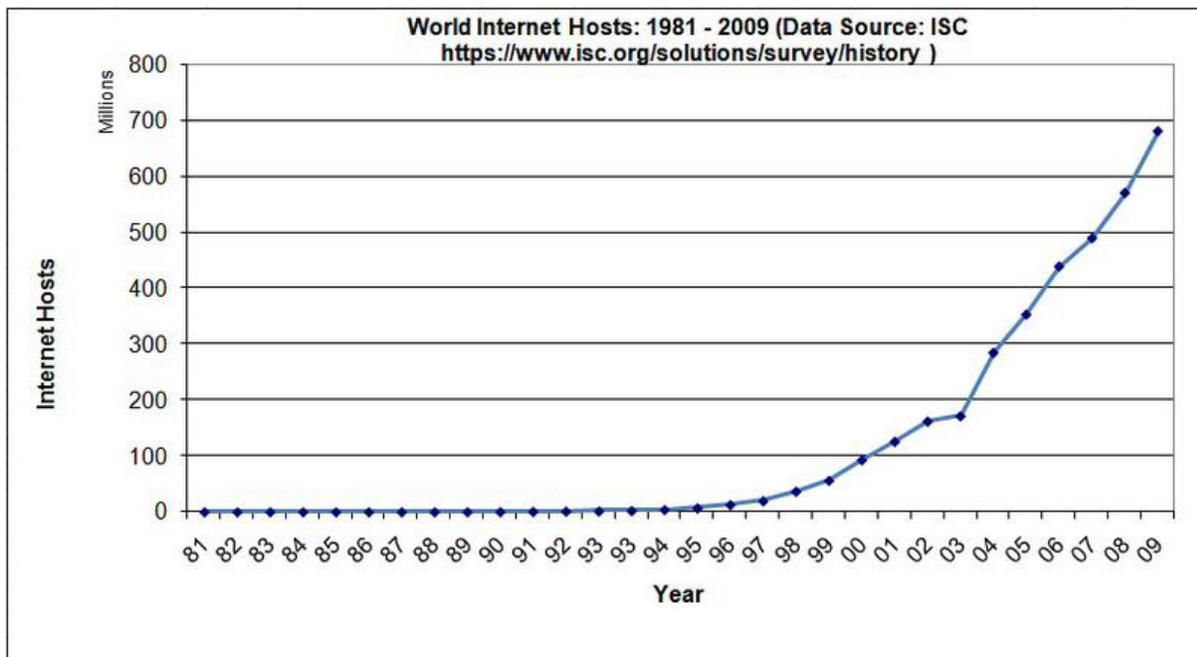


One of the research group's questions was 'What do you think was the greatest invention of the 20th century?' and as demonstrated in the diagram a large portion of the pie opted to answer 'Internet'. In fact 37% of the participants, aged 20-25, chose the internet above other inventions like penicillin and nuclear power. Their answers may be testament to their age and background but all the same this demonstrates what a powerful tool the internet has truly become.

1995 - The year the Net was won

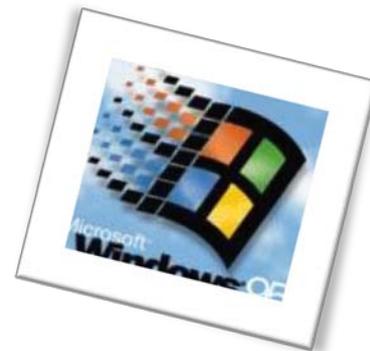
Kevin Kelly said, "Before the Netscape browser illuminated the Web, the Internet did not exist for most people."- And how true. In August 1995, *Windows 95* was released and along with it also *Internet Explorer 1.0*, but *Netscape* and *Mosaic* dominated the browser market. The *Netscape Communicator* was the number one browser in the world (wide web) until 1999. One year later, *Internet Explorer* already had a market share of over 90 percent. In 2004, the

Netscape Communicator stopped more or less to exist and *Netscape* stopped updating it. But it was succeeded by *Mozilla Firefox*, which is also developed by *Netscape* (*Mozilla* is open source software and was first used in *Netscape 6*). Over the next years *Microsoft* lost the monopoly of the browser market. They lost 30 percent over the next five years and *Mozilla*, as *Netscape's* successor won back 25 percent of the market. Considering the development of the internet, percentage figures lose their importance as 92 percent in the year 2000 meant about 330 million people while 62 percent now means more than one billion people. *Internet Explorer* has tripled the number of its users over the last ten years. The number of internet users rose from 100 million in 1997 to 360 million in the year 2000 and cracked the 1.5 billion mark in 2008, while in September 2009 there were about 1.73 billion people online.



As the internet reached new heights so did *Microsoft*. *Windows 95* sold 45 million copies (OEM-versions not included) in its first 3 months of sales. By the end of 1995 at least every fifth computer ran on *Windows 95*. Nowadays, 92 percent of the PCs worldwide use *Windows* as their operating systems. When the share price of *Microsoft* peaked in the year 2000, there were 500 million PCs in the world and now more than one billion PCs use *Windows*.

Steve Jobs, co-founder of *Apple* and *Pixar*, said, "Bill [Gates] built the first software company [...] before anybody knew that it was really the software."



A new economy

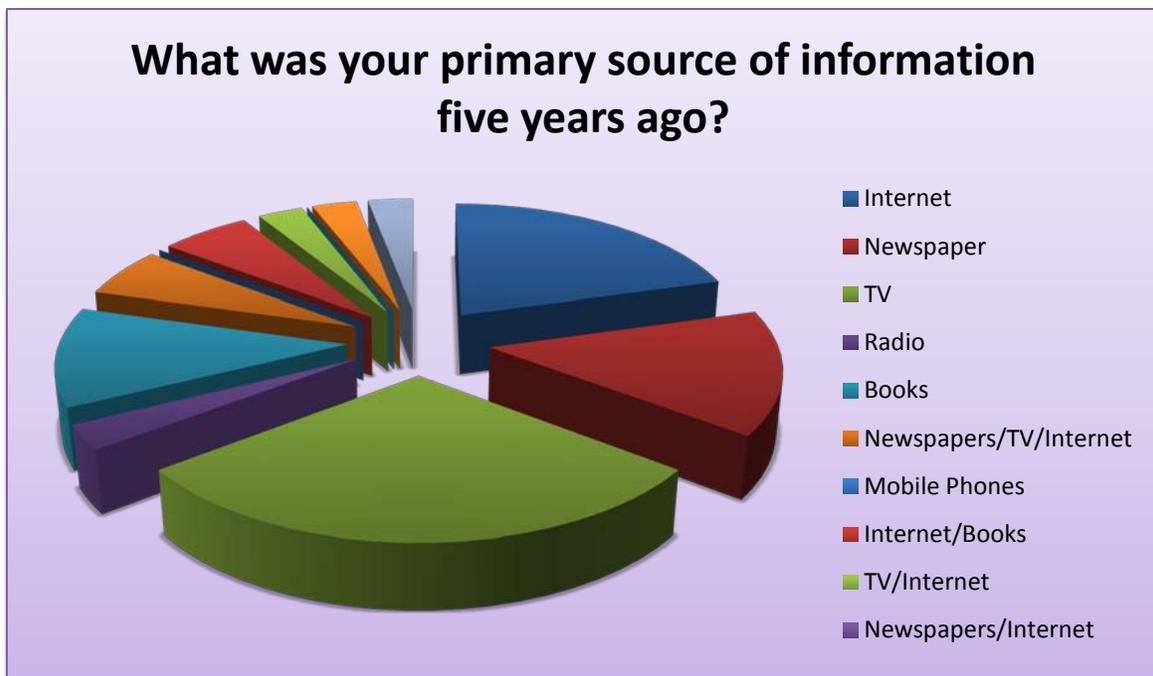
After the first Internet bubble burst, a new star flashed up on the internet sky and one star managed to get bright again - *Google* and *Apple*. *Google* managed, by just providing software to consumers, to have revenues of over 20 billion USD last year while *Apple* sold more than 6 billion songs and 1 billion applications online.

Some research analysis

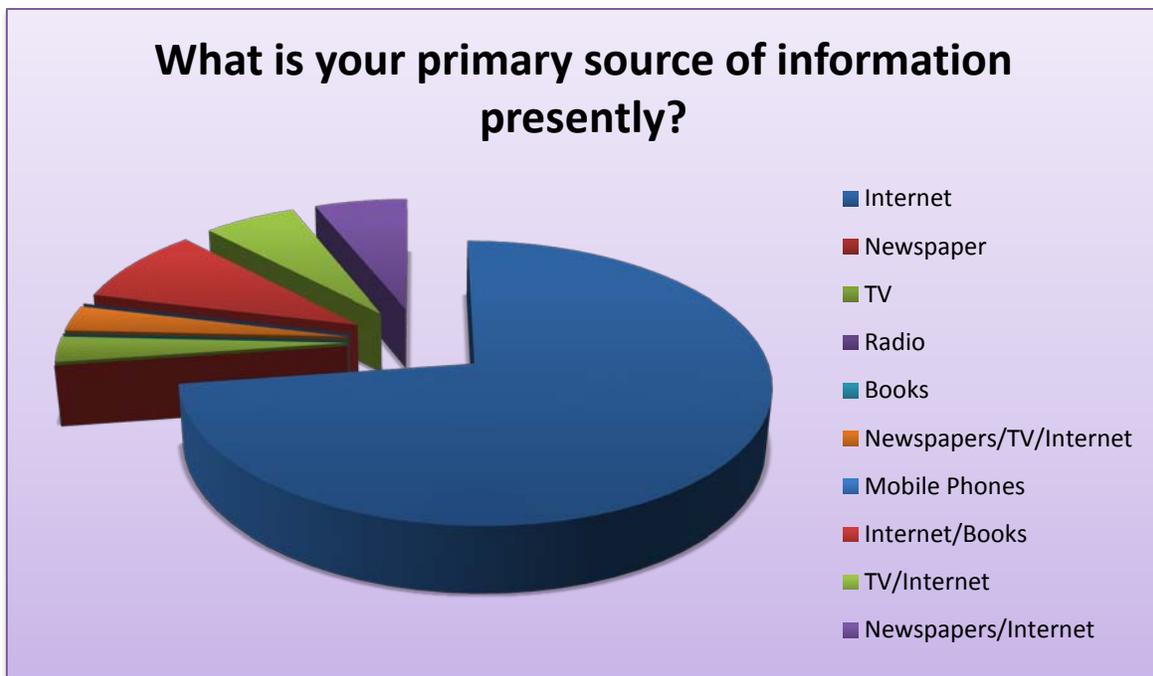
In this section the research group asked a group of 34 participants a series of questions regarding use of communication media. The questions refer to past usage, current usage and also possible future usage. Some of the results found are interesting and can be an indication of possible future trends.

The data was examined through *Microsoft Excel* and a copy is available with this research paper. The following is a set of charts illustrating the data collected with the research group's analysis underneath each diagram.

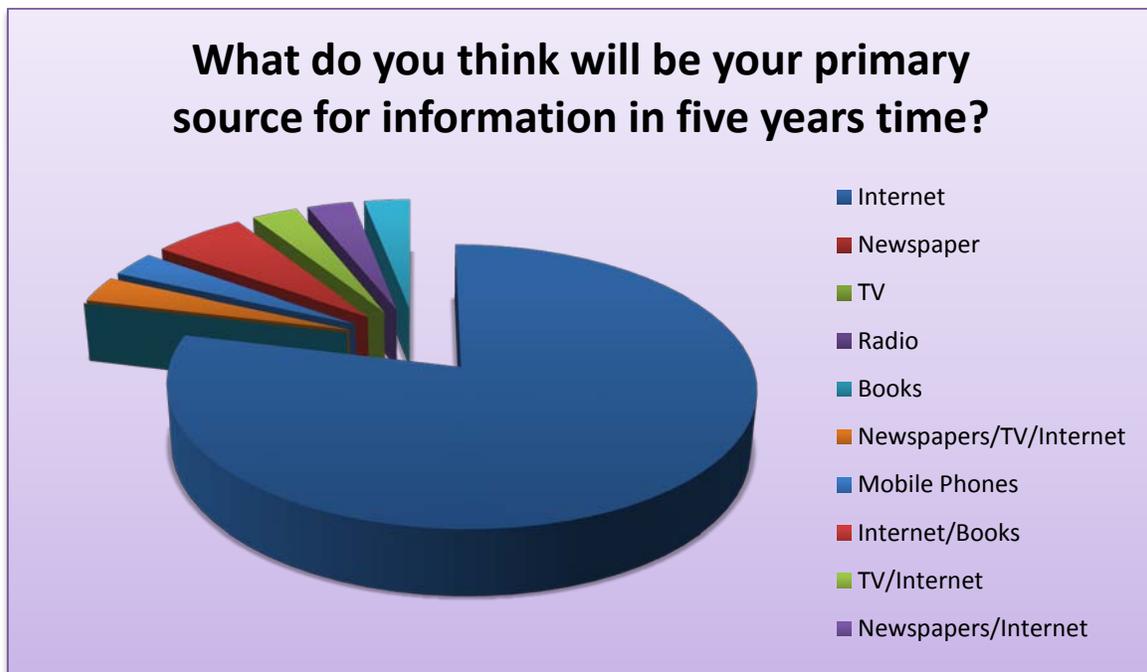
Participant	Sex	Age	Nationality	Have mobile phones made your life easier?	How much did you roughly spend, in the last five years, on mobile phones (including bills)?	How much did you roughly spend, in the last five years, on computers (including bills)?	How much did you spend on newspapers in the last two years?	How much time a day would you say you spend watching TV?	How much time a day would you say you spend on the internet?	How much time a day would you say you spend reading newspapers?	How much time a day would you say you spend on your mobile phone?	How many mobile phones have you owned up to now?
1	Female	21	French	Yes	€800	€900	€10	1 hour	10 hours	0 hours	1 hour	6
2	Female	24	Maltese	Yes	€250	€2,300	€4	4 hours	8 hours	0 hours	5 minutes	3
3	Female	23	English	Yes	€1,100	N/A	€110	5 hours	2 hours	1 hour	30 minutes	5
4	Female	23	Polish	Yes	€1,100	€650	€25	1 hour	7 hours	0 hours	30 minutes	5
5	Female	22	English	Yes	€800	€500	€2	1 hour	3 hours	10 minutes	45 minutes	6
6	Female	23	German	No	€700	€2,000	€210	0 hours	2 hours	1 hour	10 minutes	5
7	Female	20	Maltese	Yes	€2,000	€1,500	€1	30 minutes	4 hours	0 hours	1 hour	3
8	Female	23	Dutch	Yes	€1,300	€5,000	€0	1 hour	4 hours	30 minutes	15 minutes	6
9	Female	22	Belgian	Yes	€1,000	€800	€5	30 minutes	2 hours	0 minutes	45 minutes	3
10	Female	25	English	Yes and No	€2,200	€100	€1	15 minutes	3 hours	2 minutes	45 minutes	5
11	Male	24	English	Yes	€2,200	€2,200	€50	2 hours	2 hours	30 minutes	30 minutes	10
12	Female	23	Spanish	Yes	€1,200	€2,000	€0	5 hours	5 hours	10 minutes	3 hours	8
13	Female	22	Welsh	Yes	€5,500	€2,200	€200	2 hours	6 hours	1 hour	1 hour	30
14	Female	24	Maltese	Yes and No	€1,350	€1,200	€0	4 hours	4 hours	15 minutes	5 minutes	4
15	Male	20	Scottish	Yes	€450	€1,500	€1.00	2 hours	2 hours	0 hours	2 minutes	8
16	Female	23	Croatian	Yes	€500	€400	€5	2 hours	4 hours	0 hours	45 minutes	5
17	Female	23	Irish	Yes	€1,200	€250	€10	4 hours	2 hours	0 hours	20 minutes	6
18	Male	25	Maltese	Yes	€0	€2,000	€10	4 hours	5 hours	30 minutes	30 minutes	13
19	Male	24	French	No	€1,800	€2,000	€200	30 minutes	3 hours	15 minutes	2 hours	4
20	Female	24	Finnish	Yes	€1,500	€1,000	€80	0 hours	4 hours	30 minutes	5 minutes	4
21	Female	25	Estonian	Yes	€400	€900	€50	0 hours	3 hours	30 minutes	1 hour	4
22	Male	21	Austrian	Yes and No	€0	€0	€100	30 minutes	8 hours	30 minutes	15 minutes	1
23	Male	20	Austrian	Yes	€2,000	€3,000	€100	4 hours	5 hours	30 minutes	2 hours	3
24	Female	23	Austrian	Yes	€1,500	€800	€10	0 hours	6 hours	0 minutes	0 minutes	4
25	Female	25	Austrian	Yes and No	€1,000	€500	€0	0 hours	0 hours	0 minutes	0 minutes	5
26	Female	20	Austrian	Yes	€1,000	€1,000	€5	0 hours	0 hours	0 minutes	0 minutes	5



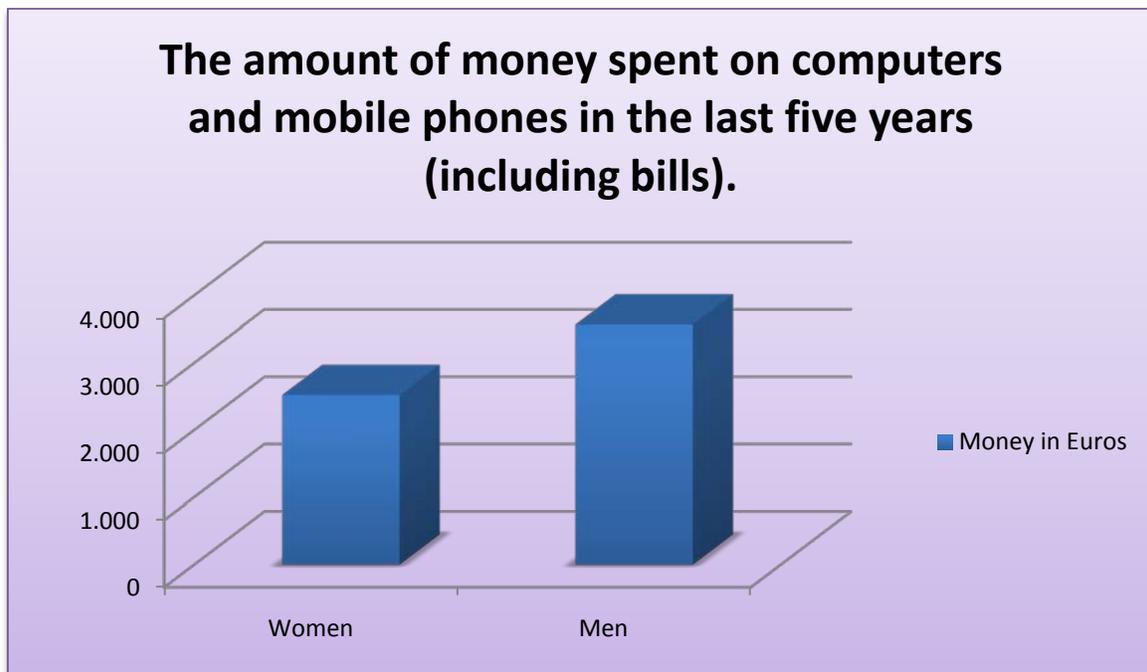
TV came in at first for people using it as their primary source of information five years ago with 14 people claiming it to be theirs. Internet came in a close second with 13. Newspapers ranked in at third with with eight and rather surprisingly Books were only the primary source of information for six people. Our participants were aged 20-25 so it is perhaps understandable that TV was their primary source of information, however, we did expect books to be higher in the list.



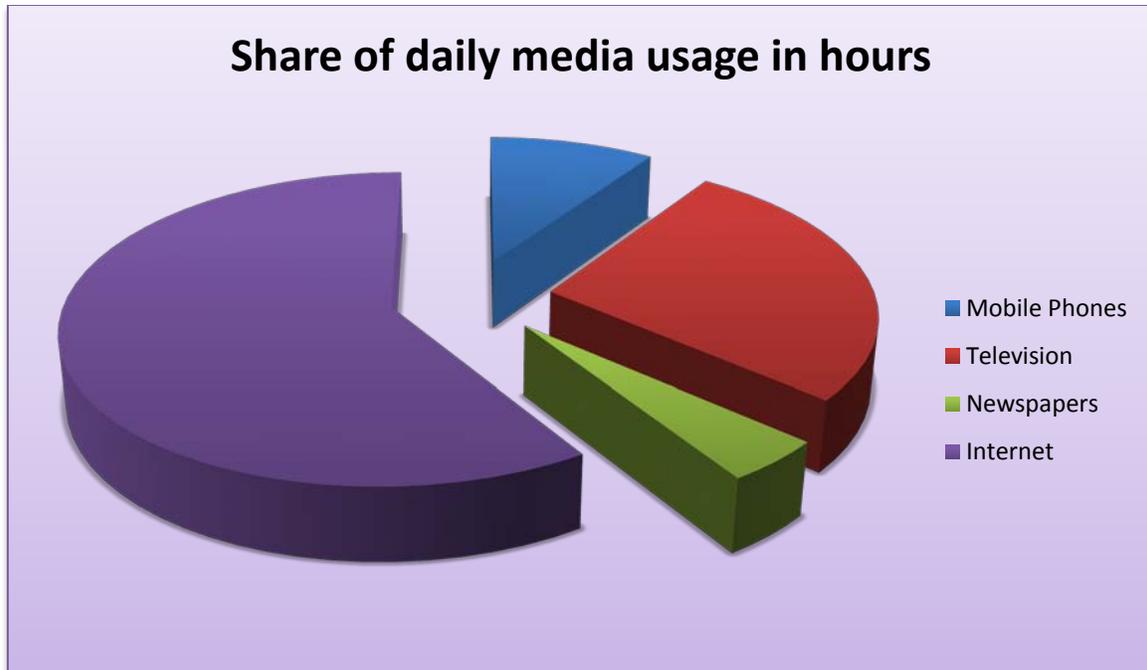
The fast development of the internet is most evident in our participants answers. The internet from being the primary source for only 13 people five years ago is now the primary source for 32. According to our participants answers the TV is no longer seen as a valuable medium for information as only four people still uses it as their primary source. The use of books even dropped down to three people. This perhaps demonstrates that people who have grown up with the internet boom much prefer its technology where the user is involved both visually and interactively as opposed to what TV and books can offer.



By 2015 all our participants feel that their primary source of information will be the internet with some also suggesting the TV and newspapers as additional primary sources. One participant talked of a touchscreen technology that is quite possible considering the technology is already fast developing into today's society. Radio does not appear to be valid primary source of information for any of our participants. This is perhaps because you can't listen to what you can want when you want with traditional radio as opposed to the internet's offerings and the fast developing TV.



The male participants spent 40 percent, the equivalent of 1000Euros, more than the female participants on PCs and mobile phones over the last five years. According to the data, a man spends 2Euros a day on PCs and phones while a woman spends 1.40Euro. On average, this totals to people spending around 600Euros a year.



This graph shows the estimated time europeans between 20 and 26 spend, using Internet, TV, Phone, Newspapers every day.

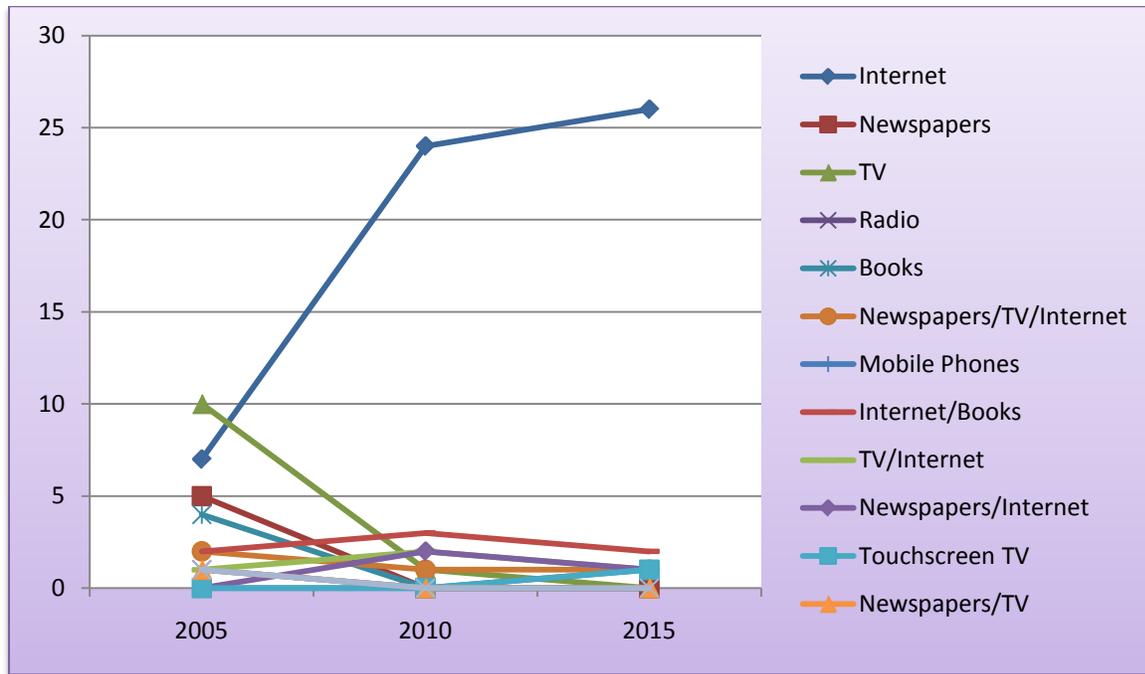
The major part is spent online, more than 4 hours in average and it varies from 2 to 10 hours a day from person to person. The internet is the only medium, which consumes a major amount of time in everybody's daily life.

About 40 minutes a day is spent on the phone, which means more than 1000 minutes a month. The usage varies from 1 minute, to 2 hours, but everybody is using it.

Newspapers have the smallest share, People spend from no time at all to 1 hour a day reading newspapers.

Almost 2 hours a day are spent watching TV in average. TV shows the most variations, some people don't watch TV at all, others spend 5 hours a day watching TV.

This shows not just the differences of the time spent using media, also ways of using them and the kind of costs are different. Most of the people we asked are students, so they are required to have a computer and internet connection. Phones are more or less required as well, but phone calls and also text messages are direct ways of communication between 2 persons. TV is probably the most passive, with no influence of content or time and little joice of channels. Newspapers on the other hand, need no additional electronic device to be read and also independend from the time of use.

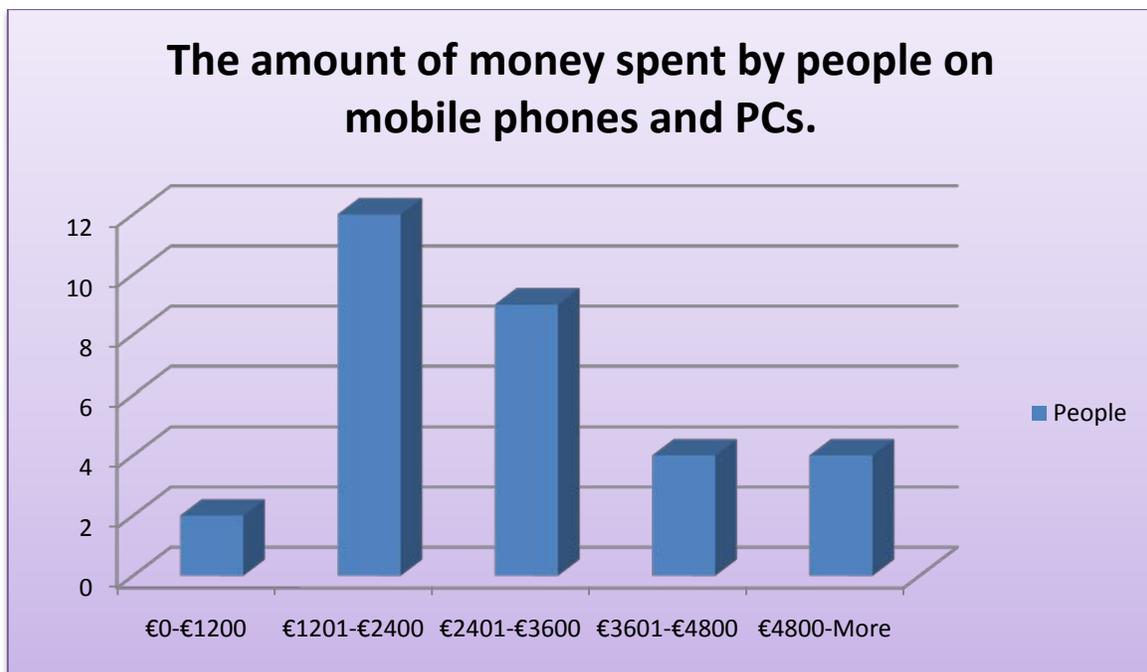


For this chart we used the information we collected from 33 european people between 20 and 26. The question we asked was: What is your primary source of information 2005, 2010, 2015?

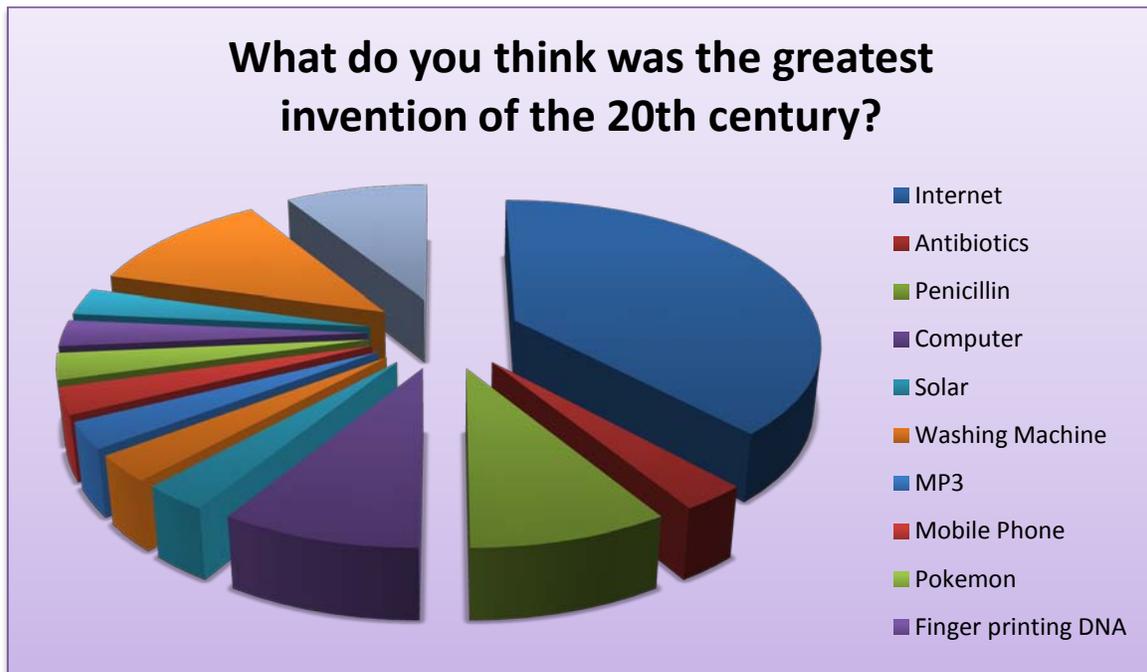
In 2005 the sources of information were quite diverse and TV was number 1 with a share of more than 25 percent. Internet was number 2 and closely followed by newspapers and books.

Over the last 5 years, Internet took off and paved all the competitors. In 2010, more than 70 percent consider the Internet their single most important source of information at the moment. TV as single most important source holds by 3 percent and 24 percent consider Internet combined with other medias as their most important source.

In 2015 the Internet will be even more important, than it is at the moment, almost 80 percent will rely primarily on the internet. Oldschool TV will lose importance and new sources will appear, Touchscreen TVs will be the first new source of information of the 21th century. In 5 years time, Touchscreen TVs, together with mobile phones, will be more important than Newspapers, Radio and Books.



This graph demonstrates how much money the participants spend on their mobile phones and PCs. Between 1200 and 2400 Euros is the average a person will spend. The data was taken over a wide range of different nationalities and so different economies are probably a major reason for the differences here.



Though one could argue that the research group led its participants on with previous question regarding communication media it is fair to suggest that a large fraction of people aged 20-25 believe that the internet is the greatest invention of the 21st century. It is a medium that has brought people together and made information much more easily accessible thus creating a more intelligent population. Inventions such as Penicillin are not romanticised in the same manner that technological inventions are. Most people do not even know who discovered Penicillin. In case you were wondering, it was Alexander Fleming.

Personal visions of the future

Telecommunication in the future will be even more part of our daily life. We won't or can't tell anymore between telecommunication and normal communication. It won't make no difference if the person we're talking to is standing right in front of us or 10.000 kilometre away. We will interact naturally with the devices and spend a major part of our waking life using them.

It doesn't matter if you use one device or several, they will work together as one with unlimited connectivity. You'll be online and available and in reach and in touch at the same time, all the time. With nanotechnology, the processor speed and memory will increase enormously and at the same time the size will decrease even more. This portable and non visible device (in your belt buckle, as pen, in the sole of shoe) will be connective to big screens and servers everywhere you could use them: at home, at school, at university...

Screens at home won't be restricted in the today's ways of ratio or size, entire walls will be screens and you can make them as big as you want to. Either you want to put some pictures on the wall or use it as a huge cinema screen, or paint on it, because it's touch sensitive too.

Portable screens will be bendable and unite the advantages of all the screens now available. If you read something, they'll work like colour-E-ink, so they're to read like normal paper and won't use hardly any energy. If you're watching videos, they're going to work like LED screens, with a great quality and little power consumption. They're also touchscreen.

The Mighty Conclusion

So the big question, 'Does science-fiction predict the future?' It is the question the research group set out to answer and through its meticulous research believes it has found one. The question is not a simple one to answer and there are strong arguments for both a 'yes' and 'no' answer and so that is why the research group had to extend its research beyond the realm of science-fiction and into that of social science in order to find its desired answer.

Filmmakers and authors of science-fiction films and novels have made many a claim of future predictions. Robert Sawyer, an acclaimed science-fiction writer, when asked what predictions he felt he got write through his writings in an interview with *CIO's* Daniel Dern said, "The one I'm proudest of is predicting the YouTube user-generated video revolution. That was in 1998's *Factoring Humanity* (in which I called it 'desktop TV,' as a parallel to 'desktop publishing')" and duly added "*Factoring Humanity* was a Hugo Award-finalist." Nancy Kress, also an author of various science-fiction books including *Stinger* and *Nothing Human* said, when asked the same question, "My novel *Beggars in Spain* postulated sleeplessness, and although we're not yet there, the drug Modafinil brings us much closer. My short story "Evolution" is based on the resistance of disease to every antibiotic we can throw at it—a prediction just starting to come

true and likely to become far, far worse.” Earlier in this research report it was also noted how George Orwell made reference to CCTV in his novel *1984*, Jules Verne described scuba diving and so on and so forth. These can all indeed be interpreted as original predictions but are they really?

Is anyone really capable of thinking of something completely original? Is anyone really capable of inventing something completely new? Is any single person really deserving of a Nobel Prize? The answer to all these questions is a resounding ‘No’. There are no completely original ideas. There are no inventions. And there is no single person who has not achieved his success without the help of others. Jacques Fresco, founder of *The Zeitgeist Movement*, claims that all people are linked and build on each other’s ideas. In a lecture given at the *University of London*, Fresco talked on how in school children are taught that plants grow and how this is simply not true as they need sun, soil, gravity, air and water and without them the plant would not grow. What he means is that there is not a single thing in this world that is not acted upon by resident forces. The way one thinks is influenced by one’s surroundings and choices. Fresco also talks of inventions and explains how inventions do not truly exist but instead discoveries. People discover things and do not invent them as one is incapable of thinking of something completely new. Before Thomas Edison ‘invented’ the light bulb he mixed thousands of different minerals before discovering a combination that worked and before man could fly man went through a series of failures that led to the eventual success of the Wright Brothers. No man has ever solved a problem without the help of others. If one man researches cancer and writes a thesis on what does not work and then another man later reads that book and through more research discovers a cure is he anymore worthy of a Nobel Prize than the other? Of course he is not. Mankind builds on one another.

It is because of this that this research group has come to the conclusion that science-fiction does not predict the future. It simply portrays ideas or materials that are already in existence in a futuristic sense. Many of these ideas of course, do come to fruition and that is not because someone was correct in their prediction but because other people built further on that idea. Science-fiction contributes to the future but does not predict it.

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