ICT in Art in Sweden 1993–2011: Tool, Medium and Theme

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Abstract. The aim of this paper is to describe and analyze the presence of ICT in art in Sweden between 1993 and 2011. The paper is based on a survey of exhibition catalogues, periodicals, newspapers, and academic writing, supplemented with interviews with the artists. By using the categories tool, medium and theme I investigate in what way ICT is present in the artworks, as well as the subjects treated within the works of art.

Keywords: art and technology, art and science, computer art, digital art, Internet art, ICT, Sweden, 20th century, 21st century

1 Introduction

The 1990s have been described as a new era in computing, referring to the development of the Internet and the increased use of computers in our everyday lives [1]. In comparison to other areas, this has also affected the development in art. In the late 1990s digital art was increasingly incorporated in exhibitions at museums and galleries, and a number of exhibitions were dedicated entirely to digital art [2]. Sweden is put to the fore as one of the countries where artists are early adopters of information and communication technologies, ICT, and it is also described as having a tradition of fruitful collaborations between ICT and art [3]. The mid 1990s witnessed the birth of various digital media labs and organizations initiated by artists, acting as fora for discussions, production and collaborations between ICT and art. And the years around the turn of the century brought with them a number of exhibitions paying attention to ICT in art, e.g. *Avatar* 1998–1999, *Bäst före* 1999, and the biennial *Electrohype* inaugurated in 2000 [4].

When it comes to the presence of ICT in art in Sweden since the mid 1990s, earlier research has contributed by paying attention to digital photography [5, 6], the introduction of ICT in art education [7, 8, 9], the conditions of production of artists using ICT [9], ICT in public art installations [10], ICT and art criticism [4], [11], and collaborations between artists and engineers using ICT [12, 13]. These studies are important as they contribute to identify art works, shed light upon a number of questions related to ICT in art in general and to interpret particular art works in particular, and last but not least, they provide a picture of the presence of ICT within different areas of contemporary art. Although a survey of these studies indicates that there is a basis for a broader approach, there is, however, no study aiming at mapping ICT in Swedish art since the mid 1990s.

The aim of this paper is to describe and analyze the presence of ICT in art in Sweden between 1993 and 2011. The paper is based on a survey of Swedish art from the mid 1990s until the present days, and I will describe and analyze a number of artworks by focusing on the following two questions: In what way is ICT present in the artwork? What subjects are treated within the artwork?

But why should one study the presence of ICT in art? And how does it relate to the transformation of the Nordic societies through ICT innovations, which is the overall theme of this volume? Artists have always been early adopters and explorers of the technologies of their time, among other things by dealing with fears and hopes related to the technological development. Moreover, it means that art always has critically examined the technologies of its time [2]. And since one could claim that art provides us with knowledge concerning societal changes, I argue that analyzing the presence of ICT in art is one way of analyzing the impact of ICT in the society. Thus, this paper does not investigate any of the innovative milestones that transformed the Nordic societies, but the discourse of impact of these innovations on the society as it is expressed in art.

But how does one map and categorize ICT in art? Which are the structuring unities suitable for the purpose? In this paper, I use the categorization suggested by Christiane Paul, as it is presented in her book *Digital Art* [2] where Paul argues for two aspects of the presence of ICT in art: ICT as a tool, and ICT as a medium. The first one refers to traditional art objects such as photography, painting and sculpture created by the help of ICT, while the latter one refers to art using ICT in order to investigate the technology in itself. As shown in this paper, there are examples of art works that turn out to be close to the borderline between these two definitions, which illustrates the difficulties of making classifications. On the other hand, categorizations are helpful and necessary tools in the mapping of a field. This might also be the reason for Paul to refer to the categorization as a "preliminary diagram" rather than a definitive classification.

However, with technology as its common denominator, Paul's classification omits art that does not use or contain ICT as a technology, but utilizes other artistic means and investigates ICT as a theme. In this paper, I argue that to be able to understand the impact of ICT in the society, one has to pay attention not only to the technology in itself, but also to how it is treated as a theme in cultural expressions in general and art in particular. Hence, by complementing Paul's categorization by investigating ICT as a tool, medium and theme, this paper contributes with a wider approach on the presence of ICT in art. This is also why the title of the paper is ICT in art, with emphasis on the word *in*, to be compared to Paul's Digital art.

The sources used in this paper are exhibition catalogues, periodicals, newspapers, and academic writings. When needed, the written sources have been supplemented with oral interviews and e-mail correspondence with the artists. Given the limited number of examples presented in this paper, something has to be said about the principles of selection. This paper does not provide a comprehensive quantitative survey of ICT in art in Sweden. However, it contains a variety of artworks representing various kinds of examples of how ICT is used as a tool, medium and theme. All in all, the selection is supposed to shed light upon how various ICT innovations are used, questioned or depicted within different artistic techniques.

This paper contains three categories of ICT in art, followed by a concluding discussion.

2 Three Categories of ICT in Art

2.1 Category 1: ICT as a Tool

This paragraph contains examples of how ICT is used as a tool by artists working with different artistic expressions such as photography, painting, sculpture and installations. Furthermore, it sheds light upon the questions raised by the artworks. What are the major issues being addressed? And what role does ICT play in the articulation of the subjects?

På Kafé from 1993 by Olof Glemme (b. 1952) is an early example of ICT used as a tool in the making of photography (fig. 1). The photograph depicts a man using a gun shooting at a radio in a café, and it is considered to be the first photograph Glemme has created by using digital image processing technology [5].

Fig. 1. Olof Glemme, *På Kafé*, 1993. Courtesy of Olof Glemme.

Glemme works within an art historical context referred to as staged photography, and his photographs have been compared to historical paintings. The working process is characterized by extensive preparations as well as after-treatment. By way of

introduction Glemme stages an idea by using people, environments and details, which he photographs. *På Kafé* was photographed with an analogue camera. He then scanned the photograph, whereupon he arranged the final picture by using the image-processing program Photoshop. Nowadays, he uses a digital camera from the start, [4]. Paul's investigation puts to the fore a number of ways by which manipulation is made possible by using digital technology in photography. Whereas some could be almost invisible in the final picture, others leave more visible traces. We find examples of the former in *På Kafé* with the coat at the hook, which has been coloured brown instead of its original green colour, a radio has been erased from the shelf in the corner, the Swedish flag outside the window was originally the flag of Skåne (a landscape in the south of Sweden), but has been changed digitally. Furthermore the picture has been reversed with the result that all the texts have been reversed back to a readable position. More visible traces of the use of Photoshop are the fire from the gun, the chair, and the radio at the table as well as its shadow. By raising questions about representation, mental conditions and the social environment referred to as Folkhemmet (literally people´s home, mainly used as a political term during the building of the Swedish welfare state) it might be argued that *På Kafé* addresses questions about reality [5], [8, 9].

Fig. 2. Kristoffer Zetterstrand, *Wanderer*, 2008. Courtesy of Kristoffer Zetterstrand.

Reality is also a recurrent theme in the paintings of Kristoffer Zetterstrand (b. 1973). His paintings are figurative and contain a mixture of motives from art history, computer games and private photographs. *Wanderer* (2008) depicts the lonely man

seen from behind while he looks out over the mountains from Caspar David Friedrich's well-known painting from 1818, although in Zetterstrand's painting the landscape partly consists of pixelated mountains from the computer game *King's Quest* (fig. 2). The scenery is composed by using the 3d-programme Maya and painted in oil on canvas. A common denominator in Zetterstrand's paintings is that each motive is depicted in the same way as it was in its original medium, i.e. the motives from computer games are pixelated, whereas the art historical objects are painted in their original art historical style. Hence, Zetterstrand does not only blend different motives, but also different styles. It has been argued that the paintings represent alternative realities, a statement which is reinforced by the use of Maya. As Zetterstrand brings together motives from different two-dimensional sources and makes them three-dimensional, he literally creates an alternative reality [15, 16, 17].

The visible use of ICT in Zetterstrand's paintings could be conceived as a comment to the language of digital technology, and it shows similarities to the public artwork *Holding Hands* from 2009 by Thomas Broomé (b. 1971). *Holding Hands* is placed outside Blekinge Institute of Technology, BTH, in Karlshamn and consists of two persons holding hands – a grown up man and a young girl. However, a significant difference could be noticed between them. Whereas the girl, made of painted bronze, looks as realistic as the child she represents with crumpled jeans and her cheeks slightly blushing, the man, made of aluminum, is all pixelated and looks as if he recently literally stepped out of the computer. The difference is a result of how the objects were made. A 3d-scanner has been used in the making of the girl as well as the man. However, whereas the girl is made in high resolution, the man is made in low resolution. In the case of the girl the use of ICT is almost invisible, whereas the use of ICT in the making of the man is far more present and could be described as a comment to the aesthetic of ICT. The overall subject of *Holding hands* deals with meetings. One meeting concerns the one between a technological interface and an individual, and others between different generations (a child and a grown up), different materials (heavy bronze and light aluminum), and different realities (the real world and a virtual one) [18].

The notion of reality seems to be a distinguished feature in art made by using ICT as a tool. But what happens when somebody is given the possibility to alter the representation of his or her own reality? And what happens to the attitude towards technology when one is constantly intertwined with a technological artifact? During 506 days in 2002 and 2003, the artist Mikael Lundberg (b. 1952) carried a small GPS on his shoulder. The GPS logged his geographical position every tenth second and gave him the information of longitude, latitude, scale, time, date and speed. At the time Lundberg was an artist in residence at Innovative Design at Chalmers University of Technology in Gothenburg, where he among others collaborated with the physician Joakim Linde (b. 1975) who made the GPS data processing and programming for *Lifeline*. The large data set collected by the GPS was visualized in two ways, as a book and as a movie.
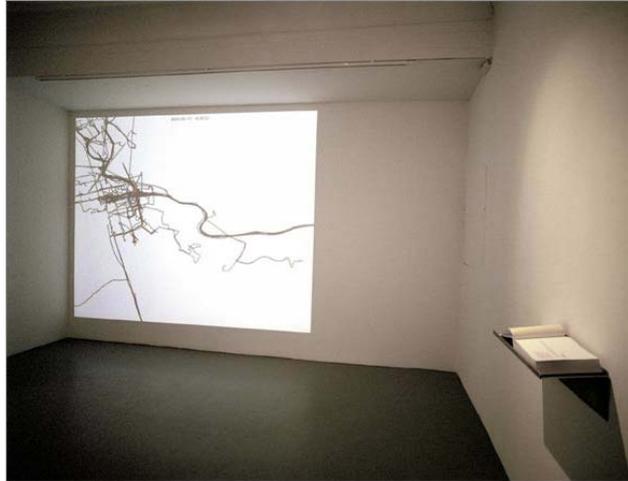
Fig. 3. Mikael Lundberg, *Lifeline*, 2003-2004. Courtesy of Mikael Lundberg.

The book, to the right in figure 3, contains tracks from Lundberg's movements with each page depicting one day, whereas the movie projected on the wall shows Lundberg's movement at an accelerated rate. The darker lines indicate a distance frequently covered by Lundberg, whereas the abruptly stopped lines represent places where Lundberg has been out of satellite reach. *Lifeline* can be interpreted as a self-portrait for which Lundberg has used ICT as a tool. However, it also raises questions about surveillance and the relationship between man and technology. The latter is illustrated by Lundberg's description of, how the GPS became an integrated part of his life and left him with a feeling of sadness the day he stopped using it. The question of surveillance is brought to the fore by Lundberg's description of, how he sometimes started to walk different paths than he usually did as a result of being aware that all his movements would be registered and represented visually. Claiming this means that *Lifeline* could also be described as dealing with ICT as a medium. However, Lundberg himself argues that his intention has not been to investigate the technology, but to use it as a tool [3], [9], [19, 20].

2.2 Category 2: ICT as a Medium

Using ICT as a medium implies that employing ICT from production to presentation has created the work of art. Furthermore, that the inherent qualities of the technology used are utilized. This paragraph contains examples of work of arts containing and using the Internet, various kinds of computer programs, and virtual worlds.

"Welcome to the Archive of Deleted Files: Access and contribute" reads the first message that met the Internet user, who in 1996 and some years to come entered the no longer existing web page devoted to the *Archive of Deleted Files* (ADF). In 1996 the artist Måns Wrange (b. 1961) and Konrad Tollmar (b. 1963), researcher at KTH, the Royal Institute of Technology in Stockholm, founded the ADF. The ADF is an

archive on the Internet that contains deleted files from various computers connected to the Internet. The ADF expands by being used by its visitors, since the only way to get access to the archive is to agree to submit deleted files from your own computer. As you agree to do this, the program Trojan Horse 1.01 is automatically downloaded to your computer, and the program starts to scan the hard disk for deleted files, recovers them and finally sends them back to the archive. When this is done, the visitor gets access to the archive. In the project Wrange and Tollmar used the Internet to investigate questions raised around the Internet such as surveillance and democracy. ADF is an early example of what has been referred to as Internet art [21]. The ADF was part of an exhibition on the Internet organized by the organization [a:t] Association for Temporary Art, founded by Karin Hansson (b. 1967) and Åsa Andersson Broms (b. 1967). The exhibition was the first event organized by [a:t] and involved artists as well as companies and institutions working with ICT [8, 9], [22].

Fig. 4. Ola Pehrson, *Yucca Invest Trading Plant*, 1999. Photo: Tobias Sjödin. Courtesy of Moderna Museet, Stockholm.

Association for Temporary Art also organized the group exhibition *Bäst före* at Tensta konsthall in Stockholm in 1999, investigating different aspects of the media society [4]. *Yucca Invest Trading Plant* by Ola Pehrson (1964–2006) was one of the art works that attracted most attention and consisted of a yucca palm and a computer placed on a table (fig. 4). The yucca palm is connected to a computer by sensors. The impulses from the yucca palm give the computer instructions to buy or sell shares on the stock market. If the yucca palm succeeds with its investments it receives more water, whereas if it fails, less or no water is added. However, being too successful leads to too much water, which creates too much activity and too many reactions interpreted by the sensors. Just like an overheated stock market. The result of the investments made by the yucca palm is shown in a graph that, despite the element of random, turns out to be quite similar to the one from a real stockbroker. The

installation soon became famous around the world and has been related to as the "ultimate annihilation of the dot-com bubble" [23]. In *Yucca Invest Trading Plant* ICT is used to shed light upon the viewers' expectations on the role of ICT in the society [24].

Random is also present in Peter Hagdahl's (b. 1956) installation *Simulated social model no2 (sensoric transformation)* that was exhibited at Moderna Museet, the museum of modern art in Stockholm, and on the Internet in 2002. Visitors to the Moderna Museet viewed the artwork on a screen depicting an ever-changing computer graphic in constant motion. But what did the computer graphic represent? And how was it constructed? A camera, placed at Skeppsholmen registered the traffic at Slussen, a heavily overloaded traffic junction in the center of Stockholm. The movements in the traffic were transferred to computers and shown afterwards as moving computer graphic images on the screen at the museum. A computer program controlled the appearances of the moving images. *Simulated social model no2 (sensoric transformation)* has been described as an investigation of the relationship between a virtual and a real world. The virtual world is illustrated by the moving images representing the regulated and controlled, while the real world is represented by the non-controllable, randomly moving traffic. The programmer is in charge of the parameters deciding the appearance of the computer graphic, whereas the traffic, however, is out of the programmer's control [25].

Objects of Virtual Desire (2005) by G+S (Simon Goldin, b. 1981 and Jakob Senneby, b. 1971) illustrates another way of investigating the relationship between a virtual and a real world as well as merging the two of them. For the project the artists collected immaterial objects, created and owned by inhabitants in the online world *Second Life*. The selection of the objects was related to the sentimental value the owner, i.e. the avatar, had to the object. Some of the objects have been reproduced in physical form and exhibited in real life. One example is the Penguin Ball, a transparent ball with a penguin inside of it. In *Second Life* an avatar named Cubey Terra created the virtual object. The physical object was exhibited together with an interview with the avatar (fig. 5). The project illustrates the interconnection between the real world and the virtual world and examines how value is transferred from the material to the immaterial and vice versa. It raises questions about value, economically and emotionally, as well as about reality [2].

Fig. 5. Goldin+Senneby, *Objects of Virtual Desire: Cubey Terra's Penguin Balls*. Installation view: Bergen Kunsthall, Bergen, Norway 2005. Courtesy of Goldin+Senneby.

2.3   Category 3: ICT as a Theme

The use of the image processing program Photoshop to arrange a final photograph; the 3d-program Maya used as a tool for a composition to be realized in a painting; the use of a 3d-scanner to create a sculpture; the use of GPS to collect information to be visualized in a film; the use and investigation of Internet, the virtual world *Second Life* and various computer programs are all examples of the employment of various kinds of ICT as a tool and a medium presented in the previous paragraphs. Although the examples cover a broad range of artistic techniques, the common denominator is the actual presence or use of ICT as a technology.

In this paragraph I intend to introduce an additional category designated as a supplement to the categorization made by Paul: ICT as a theme. How is the category ICT as a theme defined? In which way is it distinguished from Paul's tool and medium? What is its contribution? And which questions does it allow one to ask that cannot be answered by Paul's categorizations solely?

ICT as a theme refers to works of art that neither use nor contain ICT as technology, but still relate to ICT in one way or another. Thus, the works of art do not necessarily have to deal with questions concerning ICT explicitly, but may just contain a trace of it. The absence of the actual technology is the pivotal difference to Paul's categorizations. Supplementing ICT as a tool and medium with ICT as a theme thereby allows you to embrace a broader selection of works of art in the investigation and thus contributes to a more comprehensive understanding of the impact of ICT in the society. The examples presented in this paragraph contain sculpture, photography and painting.

Winfile.exe (1997) by above introduced Ola Pehrson is a sculptural interpretation of the desktop "win file" icon from windows (fig. 6). It is made of painted wood and has the size of 25x30x35 cm, i.e. approximately the size of a hard disk at the time.

The sculpture, a piece of office furniture containing physical storage space, is a three-dimensional artifact of a graphical user interface [26]. The starting point for the sculpture has been the desktop icon that Pehrson has given the shape of a physical object. However, there is yet another dimension of importance to the interpretation of the sculpture, since the archetype for the original desktop icon was a piece of physical office furniture. By reshaping the desktop icon as a three dimensional object means that Pehrson has returned the desktop icon back to the material world [27]. The transfer of the object between the virtual and real world illustrated by *Winfile.exe* has similarities with the subject discussed in the case of *Objects of Virtual Desire*.

Fig. 6. Ola Pehrson, *Winfile.exe*, 1997. Courtesy of Ola Pehrson Foundation, Stockholm.

Previously mentioned *Bäst före* dealt with issues related to what has been referred to as the media society. One of the participating works of art that did not use ICT, but depicts its presence in society, is *Sites: Nybrogatan 55* (1999) by Johan Fowelin (b. 1955), Karin Hansson and Åsa Andersson-Broms (fig. 7). The photograph depicts an open plan office in which ICT plays a significant part. The depicted office belongs to the Swedish Internet company Spray, founded in 1995, and the title refers to the company address. This particular photograph is part of a series called *Sites,* depicting places in the society claimed by the artist to be characterized as important places in society since they are the places of real power. Significant for all the places depicted in *Sites* is that they represent media production [4]. *Sites: Nybrogatan 55* is photographed by using an analogue large format camera, and the photographic film

has been developed in a darkroom. ICT has thus neither been used in the making, nor in the development of the photograph [28].

Fig. 7. Johan Fowelin, Karin Hansson, Åsa Andersson Broms, *Sites: Nybrogatan 55*, 1999. Courtesy of Johan Fowelin.

Den röda soffan 2 (2011) painted in acrylic on canvas by Karin Broos depicts a woman covering herself with a blanket whilst lying on a red sofa. Her attention is directed towards a laptop. A printer and a mobile phone are also present in the painting. I do not consider this painting to expressly deal with questions related to ICT. It is rather a snapshot from the everyday life of a woman. A large bookshelf, colourful pillows, carpets and further blankets contribute to depict a rather cozy environment. Neither the computer, nor the printer or the mobile phone are essential parts in the painting, but they are rather to be considered as what has been referred to as markers of its time [29]. *Den röda soffan 2* illustrates ICT as ubiquitous in our everyday lives.

3 Conclusions

In this paper, I have described and analyzed the presence of ICT in art in Sweden between the mid 1990s and the present days. I show that the presence of ICT in art could be divided in three categories: ICT as a tool, medium and theme. Furthermore, I show that sometimes these categories overlap each other; hence they are to be considered as structuring unities.

By way of conclusion, I would like to shed light upon surveillance and the notion of reality as recurrent subjects addressed by the artworks. A prominent question concerns in what way surveillance technologies affect and alter our behavior, hence our reality. Furthermore the inherent qualities of the Internet as a surveillance technology as well as a tool for democracy are put to the fore, and the relationship

between different worlds is investigated in various ways, e.g., the merging of the material and the immaterial, of man and technology, of the virtual and the real world. On an overall level the questions concern our expectations on ICT and the role of ICT in the representation of reality by asking: In what way does ICT alter the notion of reality? But the discourse also, finally, points at ICT as ubiquitous in our everyday lives.

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