

# Between Heaven and Earth: On the Impact of Technology on Culture and the Arts

Caroline Nevejan

<http://www.being-here.net>  
<http://www.nevejan.org>

Caroline Nevejan is a researcher and designer with a focus on the implications of technology on society. She is a member of the Dutch National Council for Culture and the Arts. Currently Nevejan pursues this research with the Intelligent Interactive Distributed Systems group of the Free University in Amsterdam. She is also research fellow with PrimaVera, which is part of the Amsterdam Business School. Nevejan was the producer of numerous international conferences, member of staff of the musical venue Paradiso, co-founder of the Waag Society, director of research and development of the Hogeschool van Amsterdam, research associate of Performing Arts Labs (UK). And was deeply involved with the Doors of Perception network.

Quiet Now, Just Wait,  
All Will Be New  
(Stil maar, wacht maar, alles wordt nieuw)

Heaven and Earth  
Quiet Now, Just Wait,  
All Will Be New  
Heaven and Earth  
(De hemel en de aarde, stil maar, wacht maar,  
alles wordt nieuw de hemel en de aarde)

## Huub Oosterhuis

We sang this song in church in the 1960s. It was a song that always made me feel happy, gave me confidence and a sense of space. This song told me I should wait patiently, that renewal would come of its own accord. Renewal sung to that tune sounded like spring approaching, not yet visible in the cold of winter.

When Virtueel Platform asked me to describe the current situation in the wider cultural sector from the perspective of e-culture, I was reminded of this song and its message of faith in the future. And I realised that developments in digital culture, global capitalism and the climate of crisis have made such lyrics almost impossible. Do children still sing this song? And how can we make it possible for children to sing such songs of faith in the future?

The 'heaven and earth' in which culture exists and develops has changed dramatically over the last decade. Music, dance, theatre, art, libraries, the media, archives, literature, film and architecture come about and exist in an environment that is rapidly altered by digitisation. These changes influence every discipline and sector in its own way. Children come into contact with and are affected by the culture around them in ways that have radically changed.

Here I will discuss a number of trends that are consequences of these developments: shifts in views of identity, changes to the roles of the amateur and the professional, shifts from management and control to guidance and inspiration, and changes to cultural participation. I will then briefly sketch out current trends in a number of arts disciplines and parts of the cultural sector.

## New views of identity

The world's population has doubled in the years since my birth and more than half of these people live in cities. Information from around the globe can be collected on a vast scale and used by people all over the world. Millions of people travel by air, sea and land at great speed. We can see and talk to people 'live' in other parts of the world. We can even see our planet 'live' from outer space. Microscopes, scans and other medical technologies have given us an internal view of our bodies, we can see babies before they are born. Above all, the technologies that make this knowledge and these images of the world possible are accessible to millions of people. Old tales and new stories merge together disseminating a new imagination around the world. And this has changed us.

If you have ever been in the mountains and looked down into the valley where you are staying, you will never forget that new perspective. Equally, humankind has created new views of its existence which have changed ideas of identity. How much and which history do people need? How many streams of information can a person cope with at any one time? How much time can a person mentally spend somewhere else while still continuing to function normally in his or her own environment? How much interaction is healthy? Where and how do people want to act and when should we let a machine take over? What dramatic developments are recognised by new people and what speed and rhythm are necessary for this to happen? Will a new aesthetic accompany each new phase of technological progress and what will it look like? If everyone has access to everything, will everyone become the same? How do we recognise difference and how do we deal with difference? Or am I exaggerating? Are people today the same as people used to be? They're born, grow up, fall in love, work, accumulate all kinds of material and immaterial stuff, have children, die.

Digital technology changes very quickly and at the same time has a profound effect on our daily lives. Whether in terms of maintaining an archive, designing a game, or developing new journalistic formulas there is confusion about the current state of affairs because even the near future presents enormous uncertainty. What would happen, for instance, if the music industry were to be more influenced by intuitive emotions than rational arguments? And the same voices were always heard through this intuitive feeling. An almost unbridled interest in new possibilities is at odds with the profound understanding that that which exists now should be protected. We can put everything on the Internet and learn all we want to there. But, says another voice, although you can find a lot on the Internet, you cannot find wisdom.

In many scientific forums the question is being asked as to whether the cognitive development of people growing up in this new media landscape is different from before. Some stress that children growing up in an urban media environment today are able to handle rapid and complex situations. But, says another voice, new children also need a context in which they can blossom through love and trust, where they can develop the resilience to experience 'processes' and learn to read and concentrate.

New views of identity generate great opportunities and new tensions: between generations, between different communities living in the same place. The relationship with people who live elsewhere has also changed. The confusion between how people experience each other in the 'real' world, how this resonates with images from the media, and how this is understood when viewed from different religious and historical contexts, is in many situations both tangible and a major source of conflict. At the same time, millions of people are in everyday contact with people who are very different from them and/or who live far away. This has never before been possible.

In the 'heaven and earth' of today a new human identity is emerging. How we experience time and place has changed, the way in which people interact has changed, and their relationships with people they know and people they don't know has changed.

#### The professional and the amateur

Another great change is underway that relates to how we view our identity. A tension has arisen between the amateur and the professional because (the role of intermediaries in) the professional environment, in particular, has changed. Record companies occupy a different position, now that professional musicians and amateurs are able to sell their own work world-wide and find each other on the many Internet platforms. The museum, which was where knowledge was exhibited, can now

become a centre for knowledge production by facilitating a network of amateurs and professionals. The museum in Gouda (known as museumgoudA) for instance, has an exceptional collection of Gouds Plateel (painted earthenware that looks like porcelain). Because the people of Gouda worked in the factories that produced this earthenware at the beginning of the last century, many pieces have remained in local families. The museum has started documenting a network around this collection, which has deepened the knowledge about the earthenware and has actually increased the size of the collection. Through this project the museum has become the director of a structural collaboration between a number of social institutions in Gouda, including the library.



Decorative vase with thistles. Gouda pottery ('plateel') factory Zuid-Holland plc, circa 1903-1904, model no. 5013 (Model from Gouda pottery factory Rozenburg plc, model 136) inv.no. 18760.

The word *amateur* is derived directly from the Latin *amator* 'lover', from the Latin *amare* 'to love'. Professional comes from the Latin for profession *professio(n-)*, which comes from the Latin *profiteri* ('declare publicly'). The difference between amateur and professional therefore appears historically to lie in the different domains in which people act: the amateur in the private domain and the professional in the public. With the arrival of large Internet platforms and the many Web 2.0 applications it would seem that the realms of action for both professionals and the amateurs are shifting. While amateurs now publish in public *en masse*, professional life is increasingly being played out within protected intranet environments. People's keenness to share information and knowledge in the public domain means the distinction between the amateur and

professional contribution can no longer be made on the basis of public claims to knowledge or information. With the help of the Internet, amateurs have entered the realm of the professional in huge numbers and the distinction between the one and the other appears, in public, to be primarily determined by context. An important side-effect of this new field of tension is that the question of how something came about and how one may identify quality has become imperative.

'Samples' of work by other people are used in digital montages of images and sound. In these montages the originals and the context in which they appear are changed. Here, too, different voices can be heard. Some argue that the montage is a new work, while others argue that the quality is in fact derived from the work of the makers of the original material. However, it appears that millions of people, including many artists, consider it normal to want to use someone else's material without feeling they are stealing from them. It feels just like learning to sing a song. Someone sings a song and if I also learn to sing it we can sing together and have a lot of fun. People grow up in an environment in which culture plays a major role and, as in nature, people have a natural sense of being allowed to use elements from this environment. The 'sharing economy', as Lawrence Lessig has described this phenomenon, seems to be much larger and more powerful than expected. However, the sharing economy is at odds with the current economy where property, including intellectual property, is the driving force behind economic and judicial dynamics. Yet it would also seem that copyright does not get in the way of people downloading music.

It also seems that millions of authors now publish in the public domain without claiming copyright. An important aspect of this is that certain conditions of trust are met, even though such trust usually arises because a platform is used by many rather than because a legally documented copyright protects it. However, this does not detract from the fact that an author, whether amateur or professional, feels the need to provide his or her work with a signature, while at the same time freely using the work of others. After all, culture has become a major part of urban nature for more than half the world's population. People like to be able to touch and use their own environments.

However, the enormous scale and scope of the Internet means the visibility and usability of the products changes at such a fast rate that we are looking for a new feeling, view and conclusion of what the rights of the author are and what right someone else has who want to use the same material, because it is in their environment.<sup>1</sup> The question of quality in the work of the professional and the work of the amateur is also up for discussion. This social dynamic leads to complex situations that need to be resolved on a daily basis.

<sup>1</sup> Fair use, copyright, copyleft and creative commons aim to protect the intellectual copyright of the author and to organise transactions between authors. The question remains as to whether this is possible and/or desirable. European research is currently being carried out at the London School of Economics into transferring the burden of proof: everyone may use everything, except another person's name. So, I may quote Michael Jackson but, without his explicit permission, I may not state that it is he I am quoting. Author's rights in this example are minimised up to the point of being able to defend one's reputation.

### Managing and guidance

Whenever the question is asked about how a person's identity develops, the question also arises about the environment the person needs. A complex question, especially when one takes into account that developments in our time have no clear intention. There is no 'masterplan', rather, a dynamic has arisen that is fed by what many people do and for which no one is ultimately responsible. Moreover, major commercial interests play a part in this dynamic. These interests, which focus on short-term financial profit, are far from always visible, but they do profoundly alter the social structure of global society in the long term. Consequently, the question of the essence of the quality of society becomes more imperative. How should the market for the commercial production of culture be organised to enable global diversity to survive? How can we ensure that when people share their information and knowledge it isn't abused? What culture will the people of tomorrow need in order to live together? What knowledge and creativity can people share and when is it necessary to earn money? How much culture can we effortlessly bear? How large and expensive may an artwork be? And how can the Dutch government stimulate and protect Dutch culture and its local cultures within this dynamic?

Traces of our history do not necessarily need to be preserved at great cost, but if the monuments and archives cannot be visited, people cannot develop a sense of history. Libraries that are prevented from making sources and resources accessible, because they are increasingly being confronted with copyright obstacles or costly thresholds, see the ground beneath them being eroded. And then, the view that what is no longer used no longer has value conflicts with the view that an exceptional archive should be preserved because one day someone will take pleasure from it. The Dutch film sector needs to be protected because it has value for Dutch culture, but if that sector does not make it commercially, where does the limit lie for how much public money s/he may receive? From this perspective, art and culture as an instrument is diametrically opposed to art and culture as a value in itself, even though both perspectives of art and culture are perfectly able to supplement each other and while respecting both the artist and art-lover.

It should be clear by now that these questions are complex and that there are no straightforward answers. In addition to this, the technologies, which are only understood by a few, are constantly changing, dominated by frequently invisible financial interests, and even large projects frequently go belly-up. Nonetheless, the question of quality arises at all levels, including in daily management situations and policy-making environments where there is seldom time to go into things in more depth. Every sector and every industry has to con-

stantly make decisions about what is necessary, where investment should be made, what should be legally protected, how much space amateurs and professionals get to make their own contribution, and how desirable pre-agreed compliance and action is.

In our rapidly mediatising society it is difficult in some sectors to predict where developments are leading, and the relationship between policy and decision is comparable to that of a farmer sowing seeds and hoping for good weather.

Daring to take responsibility in complex situations that one has no control over is difficult, but also unavoidable. The question of how personal responsibility relates to the dynamic of the collective is in many situations unclear. That the issues of the day hold sway is born out by the many news reports which put the responsibility of administrators up for discussion. True leadership, a major theme in management circles, requires a personal integrity and responsibility which is formed and develops independently of the issues of the day.

This rapidly changing landscape requires new forms of governance and organisation models to guide both the market, the public domain and the arts in and towards good a relationship. Management and control create reliability and responsibility, but can also lead to fossilisation and a lack of insight into what is actually going on. Good guidance and a healthy dose of inspiration nurture healthy, enterprising cultures, but they become vulnerable and short-lived when they lack a solid judicial and financial infrastructure. In terms of management style, a huge difference has begun to arise between the 'old' and the 'new' styles of management. The new style balances between the dynamic sketched out above – moving from control to guidance – making mistakes, but also booking successes. The old style consolidates and tries primarily to rescue whatever can be rescued, is amazed by what is going on in the world, and shuts itself off. More and more people are realising that information and communication technologies not only increase profit and efficiency, but can also make a very real contribution to the quality of the daily lives of many users and non-users. It is amazing that we can be in contact with people on the other side of the world, that we can hear music from all corners of the globe without ever going there, that we can share images and compose together, that archives are available online and that we can order library books from home, that artists can publish their own work, that the public can find it with three clicks of the mouse, that we can look up information and check facts as we have never been able to before.

Fundamental processes in the different value chains are now shifting from 'product' to 'service' design. The museum directs a network in order to be able to exhibit things. The musician publishes online in order to be able to play live. The filters of

the news are dependent on the potential viewers. In this shift from product to service design, people have become the products. This is why people are counted, followed and made quantifiable.

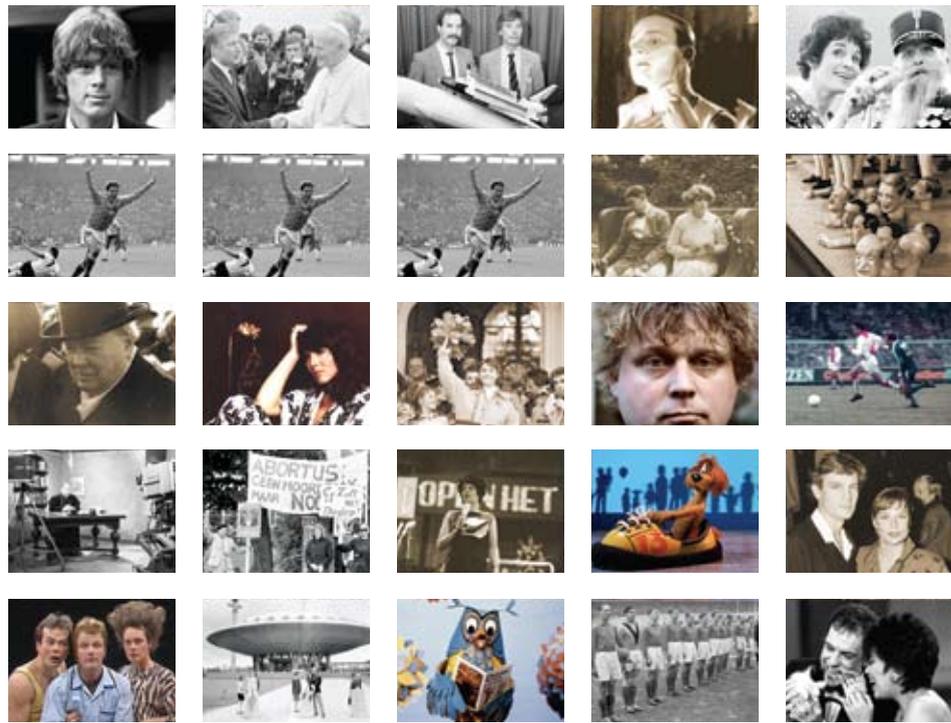
Bold direction is needed; there are major opportunities, but hard-won freedoms are at stake. Major commercial and political interests with a structural lack of transparency are currently at liberty to do almost whatever they want to. Yet few people understand the implications of current technological developments. Bold direction needs the support of a strong organisational structure supported by an adequate judicial and financial infrastructure to which technological platforms also commit themselves. Now and in the coming years, great alertness and vigour is needed because a reliable global environment could be built in the next few decades. It has become apparent over the last ten years what is possible, and perhaps impossible, with current technologies. The so-called 'innovation space' has filled itself up. It is now time to dare to find out what is happening, with all the rationality and intuition available to us. Only then will it be possible for children in 2058 to sing together

Heaven and Earth  
Quiet Now, Just Wait, All Will Be New  
Heaven and Earth

(Stil maar, wacht maar, alles wordt nieuw de hemel en de aarde, stil maar, wacht maar, alles wordt nieuw de hemel en de aarde)

without first having to pay royalties to Huub Oosterhuis, or perhaps being banned from visiting Indonesia because it can be digitally proven that they once sung a Christian song.

(In fact I would like to finish this first section with a Peanuts cartoon that I saw in the *International Herald Tribune* on Monday 20 October, 2008. But, because this is going to be published, I can't for reasons of copyright. In this cartoon Charlie Brown lies in bed with Snoopy lying on his tummy. He mumbles a bit before falling asleep 'Sometimes I lie awake at night and ask, "Can my generation look to the future with hope?"' In the next image he turns over, while Snoopy looks at him and says: 'Then, out of the dark, a voice comes to me that says: "Why sure...well, I mean...that is...it sort of depends...I mean ...if...when...who...we...and..."')



Flyer Images for the Future,  
<http://www.imagesforthefuture.org>

## Brief Impression of E-culture Trends in Art and Culture

### MUSIC:

Technological changes have had a major impact on the music industry. Recording and editing equipment have become much cheaper and better quality. The entire value chain in the pop-music industry has been turned on its head: consumers download music and artists have become their own producers with the help of the Internet and, interestingly, it has been proven that more people go to live concerts in this digital age. Apparently the experience of attending a live concert is of a completely different order. On the Internet, amateurs and professional seem to mix effortlessly; both have access to the public domain. However, the record companies had their heads in the sand for a long time. Consequently they have lost a lot of ground which they are now trying to regain through initiatives like iTunes. Classical and modern music would seem to be becoming increasingly vulnerable due to the ubiquitous presence of pop music. In fact, the number of visitors has stabilised over the last ten years. That this is primarily an older public may be just as much an advantage as a disadvantage. The decline in interest for music education – both in regular schools and music schools – is a major problem. Learning an instrument takes time. Developing talent, therefore, starts at a young age. Talent that is not spotted at a young age cannot catch up later. A good music education is vital for introducing young people to all kinds of music so that they also know what a symphony orchestra sounds like, as well as pop. Luckily there are more and more initiatives aimed at bringing young people into contact with less well-known music, such as the New Year's Concert by the Netherlands Wind Ensemble (Netherlands Blazers Ensemble), which is broadcast every year on Dutch television.

### FILM:

In film, digital technology has greatly affected the production process and distribution, as well as the filming process. In terms of filming and editing equipment, and in the areas of animation and special effects animation, digital technology has vastly expanded the possibilities available. Equipment has become extremely accessible to amateurs and films shot by amateurs at the site of major disasters often hit the world's TV news programmes. Despite the millions of home

videos (on YouTube, for instance), there are still film producers who make 'big' films possible. This is not easy for the Dutch film industry: the Netherlands is a wealthy, but small country with a limited language base. In Europe alone, where the most obvious co-productions may be found, more than 40 languages are spoken. Dutch film- and documentary-makers repeatedly run into the same production limitations. Within the dynamism of inspiration and control, the issue here is the safeguarding of a space for expression. Through investment regulations, tax agreements and subsidies, the Dutch government tries to continue to stimulate the Dutch film industry and to make a range of productions possible. Without such efforts the Dutch film climate would look very different.

#### ART AND DESIGN:

Because equipment has become so simple and sampling material so easy, one might have expected the distinction between amateur and professional artists to have changed. But just as a child's drawing is very different from a drawing by Joan Miro, the efforts of a professional artist are of a very different order to those of an amateur. Whether an artwork is produced in two dimensions (graphically), three dimensions (sculpturally), four dimensions (time-based) or five dimensions (influencing relations between people), the artwork places itself within the tradition of art and aims to contribute to it.<sup>1</sup> On the other hand, interactions between popular culture and professional artists have profoundly influenced each other: from branding to fashion, from blog to interior architecture.

However, the fact that artists and designers have begun to use digital technology in their work also has implications. The tradition of art and technology has established itself as its own domain, with its own museums, production houses, conferences, magazines and scientific publications. A number of things have radically changed in this tradition: the way the process of making an artwork is executed, modes of presentation, the ways in which art is bought and sold, and conservation and preservation methods. Because the possibilities and implications of technology are highlighted by artists in this tradition, the relationship between art and

science is closer.

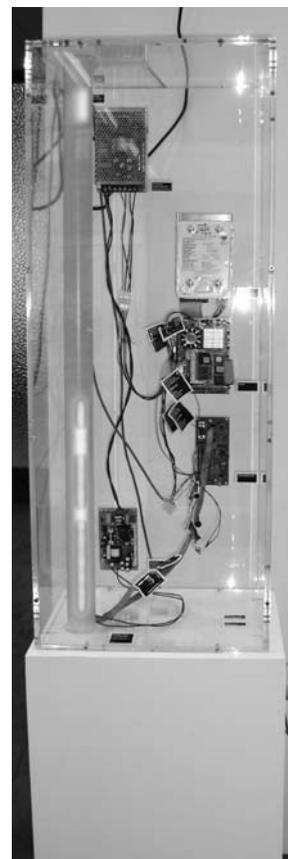
The nature of the technologies have also made other kinds of interaction with the public possible. Just as stone is different from paint, so technology as a medium presents specific possibilities. Interaction and public participation in the making of an artwork especially are completely different from in the past as consequence of new technologies.<sup>2</sup>

#### THEATRE AND DANCE:

Although digital technology obviously plays an important part in the technical side of theatre, theatre itself has hardly been touched by new technologies. Even though performances are produced which integrate new media and which experiment with holding the performance at different locations simultaneously, for example, or interacting with the audience, or employing ingenious *mise-en-scène*, in which the image plays a more important part than the actor, the nature of theatre has remained fundamentally untouched. No radical changes have taken place for either the actors, audiences or intermediaries. In dance, digital notation systems have been developed; technology is used to analyse and optimise dancers' movements. But the fundamental nature of dance for the dancer and the audience has remained unaltered by these developments. However, what has emerged, is that work by Dutch choreographers cannot be danced at dance schools because of the copyright on these ballets. Although this is not a direct consequence of technological developments, in terms of current thinking on the accessibility of cultural heritage in the public domain, which has resulted from technological developments, it is significant.

As far as the world of theatrical arts is concerned, one could argue that the omnipresence of audio-visual technologies means many more people are playing and dancing: at home, at friends', at parties, on the Internet, at a concert, or in nightclubs. On the other hand, the amount of attention and concentration people are able to commit to playing an instrument, performing a poem, singing a Dutch song, has declined.

The Internet has so far played a marginal role in theatre production and marketing. Audiences are



Barbara Visser, TL/Tijdlamp

not, to my knowledge, monitored electronically. In this sense the theatre is 'luckily' still a digital-free zone. The Internet is primarily used as an information and sales channel.

Yet it is unavoidable that the changing media environment will have a dramatic effect on stage arts, even if only because the audiences have become accustomed to other dramatic forms. After so many years of television and daily computer use, a new value is now attached to being 'live' at an event, making a visit to the theatre attractive to many people once more.

Games and environments such as Second Life, in which people make 'digital theatre' en masse, mean it is not improbable that new relations between stage artists and their audiences might also take on an Internet form before long. In the same way film and television have done, these new forms will influence how an audience understands dramatic narrative.

#### LITERATURE:

Never before in history have so many people written in the public domain. In thousands of blogs, wikis, websites and communities people describe their opinions, experiences and share their information and knowledge. Amateurs and professionals express themselves in all kinds of ways in difference environments and together, as if it were quite natural. More is being read than ever before and at the same time the market for literature published in book form is shrinking. Small publishers find it hard to keep their heads above water, the range offered by major publishers is narrowing. Knowledge about classical literature and its techniques is becoming more scant. However, the productive collaboration between players in the market and the government means this sector is thriving nonetheless. The works of many new authors lie in the bookshops, Dutch authors are translated into many languages, and the work of foreign authors is accessible in the Netherlands. The literature funding bodies, working closely with publishers, seem to be able to bring the professional sphere of literature to a high level through a deliberate and varied policy. Digitisation in the book branch is moving fast. The sector is bending its brains over the issue of copyright for digital products and publishers are developing new business models.

Yet many are very concerned about literary education and there is an concern that if children do not learn to enjoy reading, literature will die. At the same time it can be proven that as new forms and styles develop in popular culture, such as music and the Internet, that young people learn to be literate in many terrains in a way that older people do not understand and/or cannot experience. In other words: the last word has not been spoken on this matter.

The collaboration between market and government, the alternation between inspiration and control, between freedom and responsibility, works well in this sector.

#### ARCHIVES AND LIBRARIES:

If libraries still exist in 20 years' time, what will they look like? A beautiful, silent book museum, a lively public reading room-cum-cafe-cum-debating centre, or will libraries be in our homes in our computers?

Developments in the area of new media and ICT and the mediatisation of society are moving so fast that it's almost impossible to predict what not only libraries, but also archives, will look like and what purposes they will fulfil. What is certain is that the developments named above will put the intermediary role of institutions like libraries and archives under pressure. Knowledge is seen to be an increasingly important economic factor and the complexity and scale of the information stream is growing. Information and communications technologies have brought about the entry of numerous new parties into the information domain: publishing concerns, telecom companies and (Internet) providers unlock information on a major scale and not infrequently occupy a position of power in doing so. Internet is now considered a 'main library' by many people, somewhere where you can get information 24/7.

Yet, digitisation also makes us vulnerable. Our immediate past slips out of our grasp as we watch: information in the digital era is fleeting and intangible, presenting archives with a new problem. The memory of the digital government is revealing gaps and what has not already disappeared is difficult or impossible render productive due to poor technical and/or intellectual management.

At the same time, digitisation also presents the possibility of enormously widening the range and expansion of use and participation. Digitisation makes a much broader, national collection possible through audiovisual documents, which can be distributed through the Internet. Libraries increasingly provide access to information that is located elsewhere: in other libraries, in archives, broadcasting companies or museums, but also with users. This increases libraries' potential to reach a wider audience.

All this, of course, has major consequences for established institutions like libraries and archives. They are being forced to think about their own organisations (buildings, staff, composition of collections, accessibility). The public will increasingly come to occupy a central position, a public that will (want to) participate more actively in determining how information is given meaning and who will want to be served faster and better. Citizens are increasingly organising their own activities and do not want to be told what to do, but to be given support. This demands a different approach from libraries and archives, one less geared towards distribution and supply, and more towards actively facilitating expression, exchange and the laying of connections between people, ideas and sources.

Within the library sector the developments I have described have led to a fundamental discussion about the function and even the position of the public library. In the archive sector a similar discussion is underway about the existing order and how long it can last. Libraries and archives are becoming more and more involved in global developments that stretch far beyond their grasp, and sometimes even beyond the grasp of national governments. At the same time they have to deal with a public that is changing, that takes ever less notice of established reputations or institutional borders. In order to respond they will have to push their own institutional interests to one side and work and think more in network structures and cooperative partnerships.

#### Endnotes:

1

I formulated the difference between 2, 3, 4 and 5 dimensions for the first time in an interview with Geert Lovink about the 'Politics of Presence Design'. See [www.nevejan.org](http://www.nevejan.org).

2

An example of a five-dimensional artwork from the art and technology tradition: Because the concept of time – both objective (the time on the clock) and subjective (subjective) – is so strongly present at school, Barbara Visser developed an artwork that says something about the way we measure and represent time and how that can provide the impetus for the development ideas or activities around the concept of time. The 'TL/Tijdlamp' (TL/Timelight), which she developed with inventor/programmer Stijn Buis and artist Koert van Mensvoort is shaped like a fluorescent tube light (TL) which gradually fills up with coloured light. The light represents time. The longer the light hangs or stands in a certain place, the more it adjusts itself to the division of time in that space. It does this using sensors ('eyes' and 'ears') which measure sounds and movements. The 'TL/Tijdlamp' arrives at the school colourless, but learns to recognise a pattern of activities, for instance, the rhythm of the lesson timetable in a certain classroom. At the end of every lesson it will show a registration of how busy the class was in the form of a pattern of coloured stripes: increases in noise levels change the colour of the light.