What Do Grafted Surveillance Technologies Do To Architecture?

Survey of Public Attitudes to Digital Surveillance Technologies

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The installation of a security and surveillance system at the main entrance of an institutional building serves as the basis for a survey directed at measuring changes in users' practices, acceptance and interaction with the new access control system, in addition to gauging public attitudes towards digital surveillance technologies. Here is analysed the problem of integrating technology into old building designs, and whether it is the case that this leads to technology being merely grafted onto buildings: technology that works well, but instead of becoming an invisible, integrated part of the building, it becomes isolated and conspicuous.

Introduction

This paper presents the findings of a survey conducted among the users of two buildings of the University of Edinburgh. It focuses on the functionality of the two main access points and the interaction of the users with a new security and surveillance system installed in one the buildings in the spring of 2005. The survey served to measure the changes in users' practices as gathering, avoidance, and performance at the entrance hall of the building. While gauging public attitudes towards digital surveillance technologies, the survey also measured the impact of these technologies on work and study environments. The semi-structured interviews were applied to a mixed group of staff and postgrad students, over a period of two weeks.

There are two concepts that will form part of the argument: *integrative design* and *grafted technology*. I will use integrative design to denote a kind of design that considers and includes all the needs of users, technology and the building itself; this design produces a complete integration of newer technology in an older structure (the building), while covering all the needs of those who will use this technology and structure. Grafted technology will be considered as the technology that maintains itself independent of the building, which does not merge with the building, keeping for itself a separate identity, not becoming invisible.

The system and the building

Two departments of the School of Arts, Culture and Environment of The University of Edinburgh share the occupation of two interconnected buildings. The first building (Building A) is on a main street of the city centre[1], the second (Building B) is behind another building on the main street. To access the buildings there are two entrances from the street: the main entrance is in Building A, and a secondary entrance is located in the connection between these buildings[2]. The distance between both doors is approximately 25 meters (see fig. 1).

To access the building through the main entrance, the

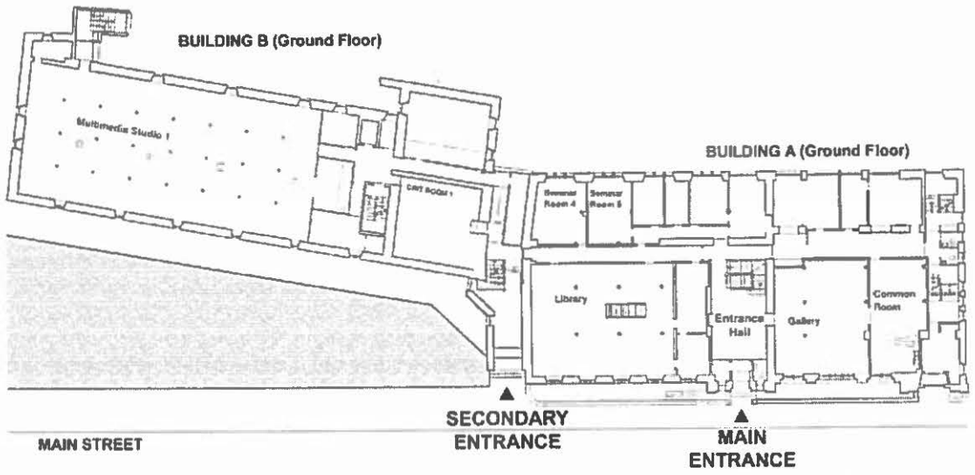

Fig. 1: Plan of Building A and Building B ground floor, showing the main and secondary entrances.

Fig. 2: Main door, view from inside

Fig. 3: Secondary door, view from inside

users need to swipe their access card; for leaving the building, the users must push a button, which is on the left side of the door to be unlocked, over a metre away (see fig. 2). To gain access via the secondary door the users need, after swiping their access card, to introduce their personal code; once their code is accepted, they can access the building; in order to go out, there is a button to push, at arm-reach distance, on the right side wall.

The survey mainly focuses on the use of the main entrance. However, the secondary entrance is constantly referred to, since their functions complement each other.

The secondary entrance used to be known as the security entrance, because until recently it was the only one with controlled access and an alarm. The main entrance security system (card control, button, entry-phone and camera) started working four months before the survey was done.

Any member[3] of the institution can access the building by swiping their access card at the main entrance. On the other hand, the secondary entrance only grants access to members of two of the institution departments (Dept. 1 and Dept. 2). During the vacation period the main entrance is open only from 8.00 am to 5.00 pm; after that time the secondary entrance is the only way to access the building with the use of the card and a personal code. In term time, the main entrance is available for use from 8:00 am to 8:00 pm.

These buildings are considered an "easy target", since they are on a main street of the city centre. The Petty Crimes Court is 100m away from the building; across the street are two mayor public access institutions (museums); all these institutions cause a large flow of people around the buildings. In the past months, several robberies have occurred in the building[4], which increased the pressure to have a form of constant security in the main entrance; the secondary entrance was not of concern because this access was only available through the use of a swipe card and personal code.

Previously, the main entrance used to have a porter in post, to help with security in the building, information and other activities. But for economic reasons the porter was removed from the post, and the main entrance although un-staffed was open during the same hours as before. This period without security

	Main Entrance	*Secondary Entrance*
Access System	Swipe access card	Swipe access card
Code Required for access	No	Yes
Egress System	Button *not* at arm reach distance	Button at arm reach distance
Operative Time	12 hr. / 7 days at week (term time) 9 hr. / 5 days at week (holydays period)	24 hours - 365 days
Users	All institution members	*Only* members of Dept. 1 and Dept. 2
Alternative Access System	Entry phone + Camera	NA

Figs. 4, 5 & 6 (top to bottom):
Swipe box; control button for door; alternative system: entry phone

lasted a couple of months, until the installation of the security system.

For the staff and students, the security system includes a swiping card box and a button in order to open the door (figs. 4 & 5) from outside and inside. For everybody else, there is an alternative system in which people push a button in a panel (fig. 6) and ask to be let in. This telephone connects with members of the administrative staff and technical personnel who have near their desks a control to open the door.

The alternative system originally was planned as an audio system only; however the staff decided to include a camera to complement it (fig. 7), in order to add an image of the entrance porch and see the person asking to be allowed to enter. This way, when the voice was not enough to identify the person, the image on the computer should save the staff having to go to the entrance in case of doubts.

The image captured by the camera is streamed in a restricted website[5], only available to the computers in Buildings A and B (fig. 8).

The camera is not intended for constant monitoring but for an instant recognition; thus there is no person responsible for looking at it constantly, neither are the images of the persons in the entrance recorded. The image of the person in the entrance is captured, streamed, and lost – with or without it being consulted by the staff in charge.

Is this a CCTV system? A very basic one, as the Oxford English Dictionary defines CCTV, closed-circuit television, a "surveillance and security system which provides remote observation of a limited (public) area by means of one or more cameras transmitting video signals to a monitor screen or screens."[6] In most systems a recording device is an integral function.

According to the First Data Protection Principle of the Data Protection Act 1998 (DPA), is established in the Code of Practice that "signs should be placed so that the public are aware that they are entering a zone which is covered by surveillance equipment,"[7]

In the entrance porch, a bright yellow legend reads "Be Aware! Security surveillance System in operation" (fig. 9); however, this legend was set up more as a psychological threat, not because of a constant monitoring of the main entrance. Pauleit points out that the deterrent effect of preventative signage belongs only to the present:

> *Signs saying: "This location is under video surveillance"... [are] often taken over by various types of fake cameras. Their power remains limited, and only comes into play when actual images of offenders are stored in the cultural memory. For this reason the second function is needed: that of the technical recording that leads to the detection and conviction of criminals. This function only takes effect in the future. The gaze of the surveillance camera does not belong to the present; it builds on a future in which it already belongs to the past.*[8]

Fig. 7: Camera in main door

Fig. 8: Streaming of the camera in closed website

Fig. 9: Legend at the left window, just below the camera.

Members of staff reported knowing about this "lack" in the system. However the actual lack of the second function (recording) depends on the purpose of the system: if the system is used as an entry device and not as a surveillance device, it is being used appropriately. The Code of Practice[9] for the DPA requires defining the purpose of the equipment first, before anything else. In the case of an entry system, in accordance with the Fifth Data Protection Principle, images are not retained for longer than necessary, that is, they are not recorded, and should not be.

Impact of Grafted Technology in Users' Practices

In the process of the actualization and adaptation of old buildings to new uses, the problem arises of integrating technology into old building designs. We can conjecture that this process is successful when it is done through an integrative and inclusive design process, producing an integrated model where technology becomes invisible, because the users do not notice it, but enjoy the benefits of it. A grafted scenario would be produced when there is a fault in the design process or a lack of procedure altogether: the technology to be added is then not integrated into the building. Technology is merely grafted on; it is there, and it works, but it is not a real integrated part of the building with a smooth functionality. The grafted technology becomes something that is not used at its full capacity, because the users clash with it, and it stops the smooth flow of their daily activities.

A grafted technology can be any kind of technologic system that did not originate within the building design, and has been installed on the building and is not integrated with it. It could be a telephone system, a multimedia system, or a security system such as the one discussed here.

As a way of measuring the acceptance and interaction with the new access control system in Buildings A and B, in addition to gauging public attitudes towards digital surveillances technologies, it was decided to conduct a survey among the users of both buildings. The data was collected by semi-structured interviews, as defined by Bryman[10], starting with a series of general questions[11], many of which were open; further questions were added in response to significant replies; in addition some questions were adapted in order

to fit the characteristics and role of the interviewee. The interview was designed with this semi-structured format to allow the users of the building to express their opinions and ideas, and not to restrict the survey only to the recitation of their practices.

The survey was directed at a group of users[12] of Buildings A and B, which belong to two different academic areas. All users work in different areas throughout both buildings, and all of them are frequent users,[13] myself (the interviewer) being another user of the buildings.

The interview was designed in two parts; the first as a means to measure the interaction of the users with the security system at the main entrance, and the changes that the introduction of this system produced in their habits and practices; the second part was intended to gauge attitudes to digital surveillance and the interaction with the camera, as well the impact of the camera in their habits at the entrance hall. The interviews were carried out over a period of two weeks, three and a half months after the installation of the system. Each interview had twenty-nine questions and lasted between fifteen and forty minutes.

Not all the users realised how their habits had changed because of the security controls: 71% were conscious that they had changed their habits, though the rest also showed signs of change, but in lesser degrees. The conscious change most commonly cited was in economy of movement during the process of accessing or leaving the building: there was no longer any extra benefit in using either of the entrances (for example, avoiding the introduction of a code, or avoiding the noise of a siren from the secondary entrance). Some existing habits were reinforced, for example the tendency to use the entrance closest to their direction of approach to the building; this was also affected by the position of the users' work area, and the stairwell that connects to it. Another change in practice was in users trying to catch the door when unlocked for someone else, in order to avoid pushing the button or swiping the card (this last action creates a conflict for the person who unlocked the door, which will be discussed later). There was a question introduced here in order to see if someone would wait for the door to close in order to operate the control him or herself. The expected answer was confirmed: no person would do this; it was considered illogical, time wasting, and detrimental to economy of movement.

Although a smaller group considered their habits at the entrance had not changed, all of them pointed out that they were expending extra time in crossing the entry threshold.

Having to introduce a PIN in the entrance was a clear deterrent for the users. Before the introduction of the swipe card system on the main entrance, many people indicated they would rather use the main entrance because, unlike the secondary entrance, there was no card swiping and no code necessary to enter there. Now, for some both entrances are considered the same in that respect, though others still prefer the main entrance since it requires only a swipe of an access card with no code necessary, and so it is easier and faster.

The majority of the interviewees said they would spend more time in trying to leave the building, but even more while trying to enter. One of the common reasons was that they would forget that a new system was in place, and would try to open the door without having pushed the button or swiped the card. The process of adaptation to the new security technology has been rough and slow for most users, and it was somehow perceived as something imposed on them.

The general opinion of the users of the security system was inconclusive: while 29% approved of the system, another 29% disapproved of it. The remaining 42%, while they understood the reason for it to be there, and accepted it in terms of security, did not really like it for different reasons (some considered it as inconvenient, not effective, isolating, and so on). The people who had a better opinion of the system were members of staff, who were involved to different degrees in the process of decision-making, or in the installation of the system. Perhaps they felt more attached to it and committed to its appropriate functionality, though by no means all members of staff had a positive opinion about the system. Those who openly rejected the system were mostly students in different stages of their studies, which had not been consulted or involved at all in the installation of the system.

Does the use of technology transform space?

The new policy of security for the buildings has the face of technology for the users, because what they see (a camera in the main entrance) is in itself a control mechanism. The entrance hall is perceived differently now, not only because this technology at the entrance stops the natural flow of users and visitors; but also because the users have new responsibilities as well, they have to complement the function of the security system, by not allowing the access to strangers into the building.

The commitment to keeping the buildings secure was measured in a question regarding the newly imposed recommendation not to allow strangers access to the building. This recommendation was circulated to all the students and staff some weeks after the lock in the main entrance was installed. There was a clear line dividing the attitude of newer students and the staff and older students. The recommendation had impact not only on the reinforcement of security and functioning of the system as intended, but also on the tendency of users to gather around the entrance hall and porch:

> *Before it was my responsibility to police the [entrance hall and porch] area, I would be more happy to hang around the area. But not now, in order to avoid having to make the decision about letting people in or not letting people in, [it] is not as comfortable to hang around, because you might face [delete: with] that situation and you do not want to face that situation... it is sort of unreasonable [or] difficult to say: 'No, I am not letting you in,' or 'have you got a card?' it seems [delete: to be] impolite, I do not know why.*[14]

The responsibility for security now rests with the person who unlocks the door, because the installed technology is not capable of making the decision. This creates a difficulty over how to distinguish those who have the ability to access the building from those who do not. The recommendation about not allowing strangers into the building was not very successful, as of the 53% of interviewees[15] who had allowed strangers in the building, almost half of them (24%) did not ask the stranger to identify him or herself, nor the reason for his or her visit, trusting in their academic appearance.

The gathering in the hall and porch has been clearly affected, not only by persons trying to keep outside of the camera's eye, but by those who used to hang around the hall or the porch who have been displaced:

> *There was always a group that used to hang around the entrance; I think it certainly affects them. They still do it, especially the smokers, still go out there, but it affects them a bit, because the door is shut, there is far more a sense of being outside the building to them. And you can certainly*

Fig. 10: Entrance wall with fire and security controls. Next to the entry phone buttons there is another graphic with instructions.

Fig. 11: Entrance Hall, showing door with posted instructions and button for openingl at the left.

see it in their behaviour... the atmosphere around the front door has changed, because the door is 90% of the time shut, and you have people outside the building, or inside the building, while before it didn't have the same ambience that the students were outside the building. They were in a way taking the building sense out on to the street. [Whereas] now is drawn a very obvious line, and all [just to do with] the fact that people have to swipe to get in, and press a button to get out.[16]

The threshold for entering the building, which before was soft, friendly and almost invisible, became an obvious line and keeps reminding people about the new rules of security. Although, it could also promise another kind of interaction, albeit more ephemeral:

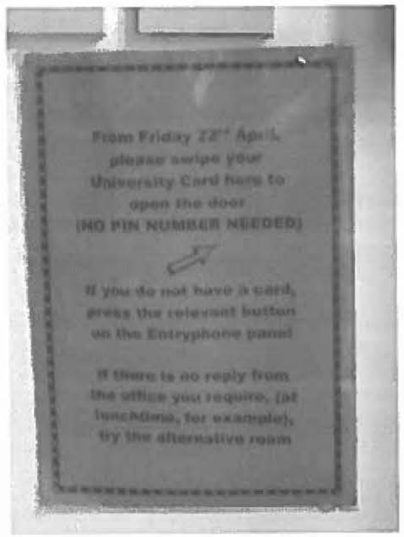

Fig. 12: Instructions to operate the accesss swiping card control

Fig. 13: Instructions to operate the egress button control

When you are entering the building and you are trying to find your card, there is a gap, there is a moment when the threshold becomes much wider, time-wise, maybe then you can meet more people whose also entering or going out. This is just a side effect, is not a straight forward thing that the camera is helping socialising, is a very side thing, you just stand for 15 sec outside of the door, so you have more chance to meet someone and maybe say hello.[17]

The fact that this security system has been grafted onto Building A has produced a kind of entry that confuses most of the new and old visitors to the building:

The other thing that makes it awkward is deliveries. Before, a deliveryman could come straight in... You can actually see them now, come to the door, do not understand how the entry system works, and go away. It has just backfired. Most of the regular people have actually got a hang of this place, if they use to often come here... With all that stuff in the hallway, all the fire stuff and everything else; there should be maybe there a red board around the path indicating this is were you are going to speak and press the button.[18]

In figures 10 to 13 , it is visible how controls have been added in the entrance one after the other, resulting in a wall so confusing that staff have to keep posting instructions on how to use the controls. Even so, people still get confused, and often do not find their way into the building.

There is a lack of integrative design, which would cover not only the needs of the smooth functioning of the installed technology, but also allow for the easy use of this technology, by giving the user an "easy to use", and "easy to understand" interface. In this case the integration between user and technology has not been reached.

If we look at the building and compare it to a human body, we can think of this installation as a kind of prostheses for the building. In *Amputation and Prostheses*, Vitali et al. comment:

To restore function at most levels of amputation requires the use of an appliance or prosthesis which is attached to the body... Through amputation, the patient has lost not only part of his body but also part of his body image, so that to restore function involves psychological as well as physical replacement. He seeks a prosthesis which replaces the lost member in appearance, feel and movement.[19]

Through this analogy, the porter, in a way, was "amputated" from the building, and to restore his function, the security and control technology should respond not only in the function of surveillance and selection, letting or not letting in people in the building, but also it should facilitate the access.

Attitudes towards digital video surveillance

In this space, technology has replaced a person: the porter at the door. Most interviewees would rather interact with a human than with a machine. 71% of the interviewees would feel more secure with a porter at the door; though a fourth of them made the remark that their answer presumed an attentive porter, who knew the users of the building well. Before explaining to the interviewees the function of the camera for granting access, the camera at the main entrance was considered a CCTV surveillance mechanism only: the users were aware that no person was looking constantly at a camera, and that this camera would not prevent crime, it just would help only in its correction; thus the idea arose that having a person in the entrance somehow would really prevent crime. In addition, the social interaction with the friend at the door was appreciated for some:

I feel weird that the school is totally isolated from the world, I would prefer another way. I think if someone were there [a porter], it would be a more polite and secure interface, and a more democratic way, more friendly for sure, socially more acceptable to me.[20]

To me security is not about someone not being able to get in, is more about being able to look for someone to consult when I have a problem in terms of security. So if someone gets in, here into the building, I would call the porter, usually I would call security; but whom am I supposed to call now? The door is closed, so what? This is one issue for me.[21]

Not all the systems that replaced the porter were noticed. The camera at the main entrance in particular was not noticed: not only because it is high up, but because cameras have became so common in the United Kingdom that they are becoming invisible; out of eleven of the interviewees who were not involved in the process of installation of the camera at all, only three noticed the new camera. For the rest, cameras in general are something that does not draw their attention any more:

(...) they have become a norm, and people actually really just forget that they are there. Sometimes, and you look and you know you hadn't been aware they were there... I think people [are] just become a bit blasé about them. But I think if you were a troublemaker, and if people become blasé and they forget they are there, in a way they are more effective, because they actually forget they are actually being recorded.[22]

People who noticed the camera mostly noticed it because of something else, such as new paint, or they had heard a conversation about it; even the interview made them curious about where the new camera we were discussing was. Only one of the interviewees did not see CCTV systems as normal part of the every day life; however he commented:

There are a lot of shades of grey in that. I do not suppose I do see them as part of normal life; I do see them as part of the acceptable way the normal life is going.[23]

Several of the interviewees, international students mostly, made the remark that this was normal life in the United Kingdom, but not in their home countries. Another of the interviewees, a British citizen, commented the following:

Britain is now such a CCTV society, you have and you cross CCTV Cameras everywhere, is just like nonsense, you just ignore them, because they are everywhere. Is not like something you go "oh what is that?" – you just got another CCTV.[24]

According to McCahill and Norris in a study of CCTV in Britain the ideology about cameras is polarised:

Cameras that monitor Them (e.g. thieves robbers, muggers, etc) are good, while cameras that monitor Us (e.g. motorists, workers etc.) are bad.[25]

This attitude was reflected in the survey too. The use of the entry camera, as that of the CCTV systems in general, was accepted in terms of security, but not for any other activity not related to security: 65% considered that it was a good strategy to have a camera in the entrance, but they did not consider it

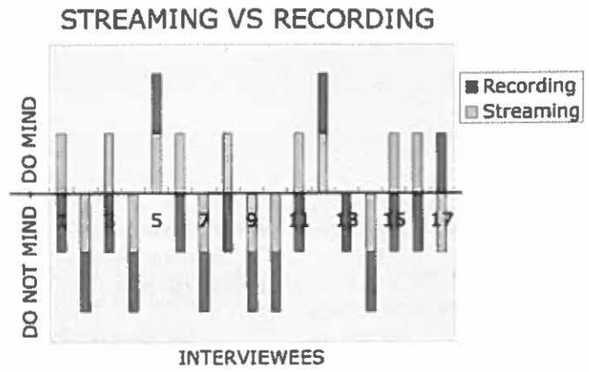

Fig. 14: Graphic comparing the attitude towards recording against streaming of their own image.

infallible. 76% of the interviewees felt secure in the building, but less than half of them had had this feeling strengthened by having a CCTV camera in the main entrance.

Most people would avoid a candid camera (referring to TV programs), but only 18% of the interviewees would avoid a security camera if they could. However, the group of persons who are conscious about behaving differently because of the camera was a little bigger: 35%. This difference was mostly oriented to the way they would behave in a place where more persons were present, a kind of "public mode" compared with a place in which they were completely alone.

The interaction with the camera depended mostly in knowing who was at the other end. Persons who interacted with or performed for the camera knew who was watching, and tended to interact more, especially with the "in-house camera". While they are not entitled to look at it as part of their duties, the workshop officers in charge of health and safety of the building often check the streaming of the entrance camera, and most of the staff members have waved to the camera thinking they would be looking at them.

35% of the interviewees openly mind being watched at any time or in any place, while more than half do not care any more, not even considering specific situations. When the observation is done in a social context (in terms of security for public spaces), where individuals lose identity, its acceptance is no major problem. However when privacy or intimacy is affected in their work area or private life, when the individual is the focus and object of observation, that is when surveillance is strongly rejected, and considered an aggression. This privacy is what the DPA intends to protect and regulate.

The possibility of streaming of the camera to the internet (which is prohibited by the Data Protection Act 1998), more than being accepted or rejected, raised the question of what could be the reason for doing something like that. Many interviewees requested a valid reason in order to approve it.

The majority of the group would not mind being recorded on the entry camera. Comparing this to the opinion about the streaming of their image the graphic in figure 8 was produced. It appears that recording is not considered as something that would affect personal privacy, because it would be kept confidential; by contrast streaming, which would make publicly known the time they entered or left the building, provoked more disapproval (see fig. 14).

However, disapproval was not very strong when people were offered the possibility of being at the other end of this camera. To measure the attraction of voyeuristic observation with this camera, the interviewees were asked if they would like to have access to the streaming. Already 6 of them (staff) had access, but only one watched it often, the rest only looked at it when they had to do it, otherwise they considered meaningless to look at the camera streaming. From eleven interviewees that did not have access to the stream, seven would like to have it for curiosity and to see their friends or visitors, though most of them thought they wouldn't look at it for much time, feeling that they would get bored.

Conclusion

The security system installed in Building A is a grafted technology: a technology that has been imposed on the building and not properly integrated into it. In this way, the control slows down the flows of the building: the difficulty of its use, confusing signs and an excess of controls in the same area caused visitors and normal users not to fully accept the system, thus the process of adaptation to it became longer and harder than it should be.

Kurzman[26] remarks on the important roll of the dialogue between amputees and their prosthetists in the process of fitting a new prosthesis. Amputees and their prosthetists run a process of trial and adjustment in which dialogue is needed for the correct alignment and fitting of the new element. This process lasts until the prosthesis felts comfortable, and stops being noticed: it has become a part of the body. In the same way, in the process of adapting new technologies to old buildings this dialogue is mediated by the design process, which should be integrative, including all the needs: those of the users, and those of the requirements of the technology to be installed, and those of the building itself.

The dialogue between the building, the technology and its users lies in this interface: which must provide clear controls at hand, facilitating the use of all elements. In order to clarify the interface in Minto House, the separation of all the other elements that cross functions in the same area, but are not directed to the users, becomes necessary.

The system that replaced the porter in the entrance is a prosthesis, which lacked a fitting dialogue (integrative design), and as a result does not restore the lost function. The process of adaptation is still not finished: users and visitors still need instructions to use the system, after almost four months of the system being in use, less than a third of the people interviewed accepted or approved of the system. Nearly half of users understood the reason for the system being installed, but still they were not sympathetic with it.

In this case the digital video surveillance part of the system is not the thing that produced bigger disapproval; rather it is the way in which the locks for the door were installed. Most users see video surveillance as a normal part of everyday life in the United Kingdom, and as cameras become invisible, people do not notice them any more. While physical barriers, such as the locks on the door, slow down access and egress, the difficulty in using the system causes a disruptive effect on the use of the building.

A grafted technology will corrupt a building in the sense that it does not integrate into the building, but it is imposed on it; thus the users suffer from this dysfunctional design, causing its poor reception. Integrative design, which considers all the elements in play, is the answer for transforming a grafted technology into an integral and embodied technology.

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NOTES TO THE TEXT

[1] Chambers Street

[2] A stairwell connects both buildings

[3] All type of staff, and students

[4] One of the interviewees was the victim of one robbery, and due to her job function was involved in the reporting of another.

[5] The address of the website is kept confidential among the staff.

[6] *Oxford English Dictionary* on-line (Oxford University Press, 2005). ,http://dictionary.oed.com> (25 Sept. 2005)

[7] *CCTV Code of Practice* (Information Commissioner, 2000) <http://www.informationcommissioner.gov.uk/cms.DocumentUploads/cctvcop1.pdf> (10 August 2005), 7.

[8] Winfried Pauleit, "Video Surveillance and Postmodern Subjects: The Effects of Photographesomenon - An Image-form in the "Futur Anterier"," in *Ctrl (Space): Rhetorics of Surveillance from Bentham to Big Brother* (Cambridge, Mass.: MIT Press, 2002), 467

[9] *CCTV Code of Practice*, 11

[10] Alan Bryman, *Social Research Methods* (2nd ed. Oxford: Oxford University Press, 2004), 133.

[11] Twenty-nine questions

[12] The seventeen people interviewed group included 6 members of staff and 11 postgraduate students (MSc students from two different programs, and PhD students).

[13] With the minimum use period of ten months

[14] Student 6: MSc

[15] Eight out of nine were students.

[16] Staff 6: Computer Officer

[17] Student 1: PhD

[18] Staff 6: Computers Officer

[19] Miroslaw Vitali et al. *Amputation and Prostheses* (2nd ed. London: Bailliere Tindall, 1986), 1

[20] Student 8: PhD

[21] Student 9: PhD

[22] Staff 3: Secretary

[23] Staff 5: Workshop officer

[24] Student 6: MSc

[25] M. McCahill, and C. Norris, *CCTV in Britain. Working Paper No. 3*, (2002), <http://urbaneye.net/results/results.htm> (10 August 2005), 48

[26] S. Kurzman "'There's No Language for This" Communication and Alignment in Contrmporary Prosthetics" in *Artificial Parts, Practical Lives; Modern Histories of Prosthetics*. (New York: New York University Press, 2002), 227.