**Losing Information is Like Losing an Arm: Employee Reactions to Data Loss**

# Abstract

A range of theories dealing with the relationship between people and technology focus on the ways people use available tools and technology for the purpose of extending their physical body. One way of creating a mentally-extended self is through the digital possessions a person accumulates and organizes.

Digital possessions are comprised of digital items such as documents that a person identifies as belonging to him and representing his identity. The loss of a document thus translates to the loss of identity. Research literature on the loss of information in organizations deals primarily with the harm caused to companies. This Study examined employee attitudes towards the loss of information. The study was carried out using semi-structured interviews with 15 employees at an Israeli organization, where a malfunction of the Outlook program led to a loss of information.

The employees experienced feelings of helplessness and loss of control upon discovering that their information was missing and compared the loss of their information to losing an organ.

These feelings indicate that loss of information severely harms employees. In light of these findings, Organizations may want to consider implementing employee training on personal information management practices, in addition to their security and privacy policies.

**Keywords**: Information loss; Digital possessions; Self extension; human–machine interaction; Employee attitudes; Personal information management

# Introduction

Theories dealing with the extension of the self are part of the discussion of the human-technology relationship. Such theories suggest that technology enables humans to expand their capabilities, and thus becomes an extension of one’s physical body.

The information a person accumulates and organizes as his digital possessions is one way of creating self-identity. The purpose of this study was to examine employee perceptions regarding loss of information: What is the significance of information for them, what it symbolizes and how they felt upon discovering that their information was missing. The employees' experiences and reactions can be explained by theories that view digital possessions as a mentally-extended self.

# Theoretical Background

The argument that mechanical tools are an extension of human organs was made as early as in 1877 by Ernest Kapp, who argued that many of these tools enhance the strength of one’s arms and hands (Kapp, 1877, in Brey, 2000). Nearly a century later, McLuhan consistently emphasized the notion that all technologies are extensions that expand the human physical and neural systems, with the aim of increasing human strength and speed. Such acceleration means greater control over greater distances. These extensions of our physical bodies first manifested in automotive wheels, roads, and paper, and later, in electronic technologies like radio, telephone, and television, which transcend time and space (McLuhan, 1964). In the industrialized world, people are dependent on technology for their survival and sustenance. Without a car, for example, they could not get to work (Mazis, 2008). More contemporary theories of human-technology interactions speak of the blurring of boundaries between man and machine. Humans and machines have co-evolved, merging to the point that we are indistinguishable from machines both physically and in terms of identity (Hayles, 2006).

The cyborg, for example, is a boundary-blurring being that combines human and inhuman elements – a human-machine. If we were to stretch our definition of the cyborg to include any linking of a human being with the various technological means of transforming or expanding human physical, sensory, mental, or conscious capabilities, then people wearing glasses, using walking sticks, or those taking medications or drugs, are cyborgs as well. Indeed, some scholars argue that in the modern era all people are cyborgs (Case, 2010; Haraway, 2006). Beyond the extension of the physical self, there is today also an extension of the mental self. Cognitive tools that are able to represent, store, restore and handle information can serve to expand cognitive functions such as abstract thinking, memory, problem solving and use of language (Brey, 2000). The ubiquitous use of digital communication technologies leads to ambiguity and contradictions in the ways we define our identities, our sense of self in relation to others and our material existence. Computer-mediated interactions create a dispersed identity comprised of the body and various abilities and capabilities (Guga, 2015). The tools we use structure our human identity, or in other words, mankind is by nature technological, as posited by McLuhan. Every invention or technology serves to extend the physical body, and every such extension necessitates new relationships or a new balance with other organs and extensions of the body (Kiran & Verbeek, 2010). Information technologies (IT) are technologies people employ as end users to create, store and transmit information. Many of today’s information technologies enable the expansion of the self by releasing people from the limits of time and space (Carter, 2015). IT enable constant updating of one’s schedule. This ability, called micro-coordination, allows flexibility and reduces the accuracy and preparation time necessary to set schedules. When IT that provide these abilities are lacking, one’s access to others is curtailed and the amount of time needed to respond and manage social relations increases. As a result, people experience this lack as a contraction of the self. IT identity, according to Carter, is defined as the extent to which a person perceives the use of IT as an integral part of her own sense of self.

In addition to technology, the amount of information that people accumulate on their computers and digital devices continues to grow over time and serves as external memory to the human brain. Thus, people may feel about lost information as if they were missing something from their brain (Case, 2010). One prominent example of the merging between people and digital devices is the smartphone. Because people cannot keep up with the flow of information, they constantly check their phones. Many already feel that their smartphone is a part of themselves. They touch it every few minutes and experience phantom pains when they forget it at home (Case, 2010; Clayton, Leshner, & Almond, 2015; Emanuel, et al., 2015; Kruger & Djerf, 2016).

A person’s possessions are another important component of self-expansion. The more mental energy one invests in an object, the more meaning is attached to it. The object becomes important and the attachment to it stronger (Levy, 2007). According to Sartre, our only reason for wanting to possess something is to intensify our sense of self and the only way to know who we are is by examining what we possess (Sartre, in Belk, 1988). People become attached to and identify with their possessions and expand their definition of identity by perceiving possessions as a continuation of themselves (Belk, 1988; Kleine & Baker, 2004). Beyond monetary value, possessions have value that stems from their ability to symbolize important aspects of self-identity, such as successes, key relationships, and things that a person perceives as meaningful. When possessions serve this symbolic purpose, it becomes part of the expanded self and transforms from something that is considered “mine” into something that is considered “me.” Therefore, loss of possessions causes not only grief but also a sense of harm to one’s self-identity. When an identity symbol is lost or destroyed, part of the self is destroyed, and this might even be seen as a symbolic form of death, leading to strong negative reactions. The more the possession is symbolically representative of the self, the stronger the emotional response when it is lost (Belk, 1988; Ferraro, Escalas, & Bettman, 2011).

The same holds true for a digital item. A personal record, for example, is a means of proving a person’s identity, remembering his or her life, actions, experiences and interactions with others (Belk, 2013; Cushing, 2013). Interactions between people and their digital items of information are diverse. People keep the items for reuse, as reminders, for reinforcing self-esteem, for filling emotional needs, and as evidence of past work and creations (Cushing, 2013).

The collection of personal information, as well as group/organizational information is a key component of human-technology relationships in the digital world. Collection is a basic human instinct. People have an urge to create personal records that serve as traces of their existence. Checks, receipts, birth certificates, diaries and other documents help us ensure our place in the world. Losing a document thus translates into losing one’s memory and identity. Without the facts that exist in the documents we lose our anchor, self-confidence and connection to other people in society (Cox, 2008). Failure to find pictures of significant family events, for example, might causes despair and distress (Whittaker, Bergman & Clough, 2010). Since the development of a collection requires intention, investment, time and energy, it is natural for the collection to be viewed as part of the self, more so than individual items within it (Belk, 1988; Sas & Whittaker, 2013). The personal information collected, in fact, constitutes digital possessions comprised of digital items or objects the individual identifies as one’s own. Such items include email messages, Facebook posts, text messages, digital photos, scanned documents and more. These digital items are intangible and can be accessed using technological devices such as computers, smart phones, media players, and the like. Various types of items represent the identity of different people. People keep items to create their heritage, share knowledge and form their identity and relationships with others. They distinguish digital possessions from other digital items through certain qualities they ascribe to their items, such as providing **evidence** of their identity, representing their identity through their **areas of interest or mood**, identification of items as having **value** for them, and the **sense of control** expressed in the ability of the digital possessions’ owners to access it whenever they wish to (Cushing, 2013). Additional evidence of this connection between digital possession and identity is the obsession companies and organizations have with tracking people's personal collections, in order to find out about their habits and preferences for economic and political purposes (Park, Chung, & Shin, 2018).

One of the key places where people are required to collect, organize, and maintain their information for repeated use, is at work (Jones, 2007). The employee has to manage and organize his information so as to have access to it when needed, and as a reminder of tasks that must be carried out (Barreau, 2006; Whittaker, Bellotti & Gwizdka, 2006).

Employees make extensive use of email in their work. They use it for planning, organizing and disseminating their work, and describe it as a vital tool they could not function without. Email has evolved over time in the organizational context. It is a simple, familiar and efficient tool that provides a supporting environment for nearly all services that users need for managing their digital collection. It has a task manager, a system for managing documents, lists of contacts, an alert system and a calendar (Bellotti, Ducheneaut, Howard & Smith, 2003; Bergman & Whittaker, 2016; Ducheneaut & Bellotti, 2001; Massey et al., 2014). Computer users spend most of their working day engaged by email. Large numbers of messages and attached files arrive through it and it draws the majority of one’s attention. One’s email inbox serves as a space for items for handling, reading, ongoing correspondence, and it serves to remind one of outstanding tasks (Whittaker & Sinder, 1996). Although the fundamental purpose of email is organizational communications, over time one’s email box also becomes a personal archive. Decisions about which information to keep and how to organize it depend on that information’s value to the employee (Alberts, 2013).

The main reason people manage their personal digital information collection is to ensure they have access to it later when they want or need it. Employees execute countless steps to save, sort, and organize their information. They build a folder tree, mark important messages with stars or flags, create reminders for themselves, compile lists of contacts, and trust that when necessary, the information will be available, and the labor invested in its organization will facilitate their access to it (Grevet, Choi, Kumar & Gilbert, 2014; McMurtry, 2014). Furthermore, to avoid loss, people usually do not like to delete files and find it hard to ‘clean up’ digital possessions, even if these are poorly organized, making it difficult to find valuable information (Sas & Whittaker, 2013). So, what happens when information does get lost? How might employees feel if it is inaccessible?

Loss is defined as an experience that takes away something of personal value (Whiting, 1986, in D’Andrea, 1992). It might be the loss of someone close or the loss of a favorite object, but what about our information? In the digital age, the probability that a document will be lost forever with no copies is small, but anyone who once used 5.25-inch diskettes, saved their documents in software that no longer exists, or visited a website only to receive a message that the site was no longer available, are aware of the fact that even documents and other digital items can disappear. They might, therefore, want to create their own copies and organize them in the digital collection they have created (Cox, 2008).

The literature on loss of information in organizations deals mainly with preventing the loss of information through actions aimed at creating information security (e.g., Whitman, 2003; Dervin, Kruger & Steyn, 2007) and backup systems (e.g., Chervenak, Vellanki & Kurmas, 1998; Morris & Truskowski, 2003), the preservation of digital information (Addis, Wright & Miller, 2009; Brunsmann, Wilkes, Schlageter & Hemmje, 2012), or organizational information policy (e.g., Bello Armarego & Murray, 2015; Raymond, 2013). Another major concern of companies and organizations is information privacy (e.g., Chen et al., 2018). However, the literature lacks reference to the perceptions of employees regarding the loss of their information.

The purpose of this study was to examine employee perceptions regarding loss of information: What was the meaning of the information they kept and organized and how they felt about its possible loss.

# Methodology

In a mid-sized research organization in Israel, a rare malfunction that occurred in 2018 erased the information that was saved in the Outlook software. The attempt to recover the information from backups took several days. This mishap provided an excellent case study and opportunity to examine the employees’ attitudes towards the loss of information. The research was a qualitative study, using a phenomenological approach, which focus on the phenomenon as perceived by the person who experienced it (Van Manen, 2017). In the days following the malfunction, semi-structured interviews were conducted with 15 employees at various ranks and in various positions in the organization. Twelve of the 15 employees were women and three were men. Two of the interviewees were IT support staff. The employees were asked to describe their feelings when they discovered the problem and how they feel about the possibility of losing the information saved in Outlook. Additional questions addressed their job performance during the days when their information was inaccessible and the way they dealt with the problems created by the loss of information and the lack of resources necessary for their work.

One of the problems that can arise in research based on interviews is a bias stemming from seeking social approval or the need to explain feelings in words. Using metaphors is an effective means of reaching beyond the limits of employees’ explicit knowledge in order to understand their authentic, personal perceptions. Metaphors express people’s unconscious reaction to certain issues. They enrich the interpretation of the finding and enable a better understanding of perceptions and approaches that are difficult to discern in straightforward narrative statements (Bullough 1999; Sillman & Dana, 2001; Neuman & and Gutterman, 2018). Therefore, in addition to the above-mentioned questions, the employees were also asked to describe their sense of loss of information metaphorically: “Losing information is like...” The incident was fresh in their minds and traumatic, so employees recalled the experience and their feelings about it well. The interviews lasted between half an hour and three quarters of an hour. The interviews were recorded and transcribed, and then analyzed using a thematic analysis method. Thematic analysis is widely used to identify, analyze and report patterns or themes within qualitative data, in order to detect repeated patterns of action and meaning (Keshet, Popper-Giveon, & Liberman, 2015).

# Findings

The analysis of the interviews revealed several themes, which are presented in this section. The information stored on Outlook served as an extension of the employees' memory. they used it as a reminder of their scheduled meetings, contacts details and the tasks they need to perform. When the malfunction in Outlook occurred, the lack of resources caused an inability to carry out tasks and provoked frustration with inefficient ways of working. This in turn, damaged the professional identity of the employees and led to a strong emotional reaction. Interviewees expressed their feeling about their information loss metaphorically, equating it with losing a bodily organ.

## 4.1 Outlook as extension and substitute for memory

In the digital age, people rely less and less on their memories and use technology for easy access to the details and information they need. Outlook is used by employees as a diary, calendar, contacts book and archive. They organize the information and trust that they can access it easily and quickly when needed. When the malfunction occurred, the workers suddenly felt how dependent they were on the technology: “The feeling that you have such a dependence on the email, it runs your life and you rely on your memory less” (Rachel, the purchasing manager). Rachel, was preoccupied with the subject of passwords:

I went home, and I kept checking the phone for what was going on and if I could log in, and each time I saw that I couldn’t, and I started to feel stressed... The first thing that was very stressful was the issue of all my passwords being there. That’s what worried me the most.

The Outlook calendar is used to record and remind one of work meetings and tasks. The employees were confused. They did not know what tasks awaited them and what meetings to attend. For example, Tamar, the training supervisor, said, “at the beginning of the week or the week before, I log in to see whether or not there is training scheduled - and I did not have it, which is very significant.” Gila, the project coordinator, referred to email as serving as a reminder in addition to the calendar:

Helpless. The calendar is gone and I don’t know who I’m supposed to meet and when, and then I saw that the mail was gone too, and I cannot remember what I wrote to who, and no one in the office has mail and we do not know what has gone out and who received it, and can’t remember anything that was there. It’s at the level of embarrassing, embarrassing.

Galit, a marketing department secretary, spoke of being afraid of forgetting the tasks that had to be done: “When I got in and did not have email, I said, ‘Wow, I have no work.’ There was fear of missing work, of forgetting what I had to do.”

## 4.2 Practical implications: an inability to perform the work

The interviewees expressed feelings of frustration at the difficulty in carrying out their work. They spoke of discomfort, Sisyphean labor, and inefficiency. Hannah, a secretary, and Tamar, the training coordinator, used the phrase “it sucks": “It sucks, really.” Tamar spoke of the frustration she felt because of the missing folders:

I had folders that were related to my professional field, and all the correspondence and questions I asked and the answers I received just disappeared, and then when I wanted to continue working, it kind of held me up, because I didn’t want to ask the same question twice. It was very frustrating at work.

Dina, an organizational consultant referred to the need to reconstruct all sorts of personal appointments that disappeared from her calendar: “I had to call the clinic and ask them to send me the appointments again. It’s very frustrating.”

Other employees spoke of feeling frustration because they could not do what they had to due to a lack of resources. Their contacts address book, for example, was empty. The internal addresses of employees are structured into the organizational Outlook, but access was not convenient. Normally, when one begins typing in the name of someone with whom one has already corresponded in the past, the address pops up and auto-completes. After the malfunction, the address book had to be searched again. External addresses that were saved in the contact list were gone and could not be retrieved. Orit, the human resources coordinator, spoke about the impact on email communication: “I said, oh dear. How will I work like this? I couldn’t send emails, I couldn’t even check the phone book.” The loss of one’s contacts made group messaging difficult as well. Nir, the organization’s spokesman, discussed the difficulty of carrying out his work under such conditions:

Outlook is a central tool in the sense that today intra-organizational and extra-organizational communications is managed by email. I hardly answer people over the phone. Once you manage all your communication via email, including the contacts and the calendar where you make appointments, then when it’s down, everything is lost. You’re naked.

Another frustration stemmed from the inefficiency in doing work. Noa, a diagnostician, recounted how employees in her department were forced to work as a result of the mishap: “We went back to work like we used to many years ago. Going through all the forms and handling them manually ... It was a very intensive week of Sisyphean labor.” Nir, the organization’s spokesman, used a simile to describe the difficulty:

There used to be tools in the toolbox and now you are missing the hammer, missing the screwdriver, and you cannot complete the work properly and with the required efficiency. I can bang with the pliers instead of the hammer, but it comes out crooked. It requires more time and effort.

## 4.3 Information as part of professional identity and status

Employees felt that the lack of resources and the loss of information could negatively impact their professional identity. Employees usually would like to be perceived as responsible and professional and to enjoy their colleagues’, clients’ and supervisors’ esteem. The digital collection employees amass in the course of their work constitutes a part of their personal identity, and the tasks they perform contribute to their professional standing. As a result of the malfunction that caused the information to vanish from Outlook, employees lacked the resources necessary to carry out their work and the documentation testifying to the completion of tasks, and they experienced difficulties communicating with colleagues and customers within the organization and outside of it. All of this made employees experience the feeling that their professional status and identity were threatened. Rachel, the purchasing supervisor, treated work-related information as particularly important to her identity: “Wow, it seems to me the most disturbing thing, especially in the area having to do with work. It’s critical. Worrisome. Destructive. It seems unreasonable to have to deal with it… It’s like personal identity,” she said. Esti, the office manager, also referred to the difference between responsibilities at home and work responsibilities: “I’m not sure I would have been afraid for my private matters as much as for the work here. I have a responsibility here, why didn’t I file those documents?” Sarah, who works as a secretary in the training department, commented on the importance of the documents she saved: “It was hard. I said, ‘Wow, I have important documents that I can use to prove anything. This is something I need to have accessible.’”

In addition to missing contacts lists, other problems communicating within and outside the organization made the employees uncomfortable. Shula, a collections coordinator, spoke of the desire to provide efficient service to callers: “There’s nothing critical, it’s not life and death, but we like to respond to customers, if not today, then the next morning ... Some people said to me, ‘I sent you an email and you didn’t answer.’”

Esti, the office manager, spoke of being unable to meet the expectations of colleagues outside the organization: “It was traumatic for me, because we receive very sensitive and urgent materials that need to be responded to... It drove me crazy that there might be something I needed to respond to.” She also referred to meetings that had been scheduled: “When a person has to be at an outside meeting and he doesn’t know about it, it’s a real problem, and they (IT support staff) could not solve it,” she said. Gila, the projects coordinator, raised the problem of meetings that were supposed to take place within the organization, but employees did not know about them:

The calendar is gone and I didn’t know who I was supposed to meet ... It’s not that I felt wrong personally, because it was not my fault, but I was facing people I had invited. I had a responsibility towards the managers, and other people too, who didn’t come to the meeting.

And Dina, an organizational consultant, spoke of the relief she felt because everyone had lost their calendars, meaning they would understand why other people didn’t make the meeting. “it was some comfort that everyone was in the same boat. if I didn’t make it to a meeting, he didn’t have the meeting written down, so he didn’t show up either. And everyone understood that there was a problem.”

## 4.4 Emotional reaction

The moment they learned of the malfunction that erased their information is described by the employees in terms such as shock, anxiety, panic, loss of control and stress. They described dealing with the aftermath in terms such as frustration and uncertainty.

Dina, an organizational consultant, recounted: “At first there was a kind of panic, where did all my things disappear to?” Sarah, secretary of the training department, spoke about feeling stress when she understood that it was not certain that the IT support staff would be able to solve the problem: “We know that there is a backup and we thought it [the information] would come back. They solved it at first, and then the malfunction recurred and they said they were working on it, but it wasn’t certain any more. It was stressful.” Galit, a secretary at the marketing department, thought about the tasks she had to do and that she couldn’t know what they were: “It stressed me out a little because all of my tasks are in Outlook.” Esti, an office manager in the organization, was more troubled by the meetings whose times had disappeared: “All the meetings disappeared, and I was hysterical because it was the director’s meetings ... I don’t think anyone was more hysterical than I was when I discovered it.” The emotional responses, such as embarrassment, stress and shock, reflect the employees’ dependence on technology, as can be understood from the words of Tamar, the training coordinator: “Helplessness, in a certain sense, at least in the beginning. Real helplessness. I felt how dependent I was on technology and how this could really hold me up at work.” Gila, the project coordinator, also used the term “helpless” to describe her emotions: “When I got to work on Sunday, I saw there was nothing, and then it was unpleasant. Helplessness.” Tamar, the training coordinator, spoke of the moment of discovery: “At that moment, for the first second, everything became black and it took me time to get myself together.” Orit, the human resources coordinator, described the trouble caused by the loss of the information in her calendar, which also served to remind her of personal matters: “Listen, my whole life is in the diary and emails. It also contains all kinds of passwords for bank applications, etc. And once it is lost, I am left without that information.” Avi, an IT support technician, expressed the fear that arose as a result of the malfunction: “It’s this feeling that in an instant everything can be erased.”

One of the problems the employees discussed was their sense of uncertainty: Uncertainty about the source of the problem, its extent and how it was being handled. Rachel, the purchasing supervisor, spoke of her uncertainty about the extent of the problem: “... and then I realized that it was becoming something more serious, and then you start to think, OK, what have I got there? What are the things that are important to keep?” Avi, from IT support, tried to explain his feelings of uncertainty by means of an image:

It’s like you’re standing on the edge of an abyss and you don’t know what to do. Trying to fathom the depth of the abyss and to what extent your material is lost. If it’s two meters then you’ll deal with it, but if it’s much more, then it’s a much more complicated story. You don’t know. It takes time to digest what you really were keeping there.

The members of the IT support staff that were interviewed described the employees’ reactions as shock:

“There were severe reactions. some people were stunned ... there were people who couldn’t fathom that such a thing had happened… People were initially at a loss: “Well, I’m not working, I don’t know what I should do.” One person was really in a panic and some really whined ... “What happened? Where is all my stuff? I’m getting my things and going home.” There were those who whined: “Why did this happen to me and why do I deserve this?” (Doron)

Avi tried to explain the reason for the employees’ emotions: “some people were shocked. They had put everything there [on Outlook], simply everything; personal folders and other folders. A person just dumps his whole life there. Personal stuff, work, all together.”

## 4.5 Information as part of the body

Interviewees were asked to think metaphorically about their information loss. When completing the sentence: “Losing information is like...” many of them used powerful images related to bodily organs or limbs and life itself. “It’s like losing myself. Losing me,” said Rachel, the organization’s purchasing manager. “It’s like losing an arm. You can’t do anything. If you have no arms, you can’t do anything,” described Orit, a human resources coordinator. The same imagery was repeated by Tamar, a training coordinator: “It’s like losing yourself. It’s part of you. Maybe it’s an exaggeration, but at that moment I felt like I was losing my arm ... Once I thought I lost my phone, and then I also felt like part of my life has disappeared.” “Losing information is like… losing your life. Yes. Because we live on information, we rely on it and develop and examine and learn everything through the information,” explained Hannah, a secretary in the human resources department.

These images reflect the strong feelings and powerful emotions of employees about the loss of their information. They described their information as part of themselves; of their lives, of their identity, of their bodies.

These finding demonstrate how information technology is used as self-extension. The interviewees had developed a dependence on Outlook tools as a substitute for their memories. The lack of resources to carry out their work and the disruption of communications with other employees and with customers inside and outside the organization damaged their professional identity and status. They used metaphors that equated the loss of information to the loss of an organ or life itself.

# Discussion

Studies on expansion of the self are concerned with the way in which technology and possessions can become a continuation of the body, increasing its strength and speed (Brey, 2000; McLuhan, 1964), improving its abilities, endowing it with greater control (Downey, Dumit, & Williams, 1995; Verbeek, 2008), freeing it from the bonds of time and space (Guga, 2015; Mazis, 2008), establishing one’s self-worth (Belk, 1988; Kleine & Baker, 2004) and becoming a symbolic expression of a person’s identity (Ferraro et al., 2011). A person’s possessions consciously or unconsciously, intentionally or unintentionally, can become an extension of oneself (Clayton et al., 2015). Digital possessions, like other possessions, consist of digital items or objects that the individual recognizes his or her own. Deciding what to keep and include in one’s collection of possessions requires intent, investment, time and energy, and thus, it is natural that the collection is perceived as part of the self, more so than its individual items, and the development of the collection is part of the construction its owner’s self-definition (Belk, 1988).

Outlook software is a technological tool used to manage the employee’s personal information in the organization. The information collected in Outlook by employees during their years of work can be viewed as their digital possessions. Employees use Outlook to organize their information, including files, messages, appointments and contacts. From the interviews with employees in the organization where a malfunction caused the information saved in the Outlook software to disappear, it was possible to learn about a powerful emotional connection of employees to their information. Employees perceived their information as an inseparable part of themselves. The metaphors that equate loss of information to loss of organ, identity, and life point to the perception of loss as a form of death, as described by Ferraro et al. (2011).

Their reliance on Outlook as a substitute for their memory is an example of the theoretical arguments about technology as an extension of the body (Brey, 2000; McLuhan, 1964; Verbeek, 2008) – in this case, the brain. The employees lost the correspondence that enabled them to keep track of the tasks to be carried out, they did not know what appointments to expect, and had no contact information. Many of the interviewees used the term “helpless” to describe the feelings caused by the malfunction. They experienced their dependence on technology powerfully.

The main reason people manage their personal collection of digital information is to have access to it later, when they want or need it. Developing a collection requires time and energy. Employees invest cognitive effort in creating folders, and categorizing information items into them (Bergman, Whittaker & Falk, 2014). Over the course of time, email folders become personal archives, and many employees, especially veteran ones, accumulate documents over the years. They create in their Outlook software a hierarchy of folders, where they keep documents that attest to work accomplished and various correspondence that can be used when needed. All the same, the issue of losing one’s personal folders archive was only mentioned by a minority of the interviewees. Most were more troubled by other issues, such as the loss of their calendar, reminders and contacts. In a recent article from 2018, Belk has somewhat altered his position on digital possession, finding evidence that digital collections such as music and pictures do not engender the same level of satisfaction in their owners as physical collections. People have the sense that these collections are temporary and can be lost in the event of a hardware or software crash. Therefore, despite the similarities in the ownership patterns, “you are what you own” is transformed when it comes to digital possessions into “you are what you have access to” (Belk, 2018.) This approach may explain the lower priority assigned by interviewees to their folders collection in comparison to Outlook’s communications and calendar applications. Another possible explanation is their belief that the information could be recovered and that the loss was temporary, in which case the information in the folders is important but not urgent and not necessarily vital to day-to-day work. The things that really disturbed the employees were their inability to complete their tasks properly, the fear of missed appointments and the loss of their contacts. These problems are related to their professional identity and status. Carter (2015) discusses the fact that today’s information technologies liberate people from time and space constraints by allowing schedules to be revised up until the last minute and reducing the specificity required when trying to set appointments long in advance. This flexibility in social relations expands the self, while lack of these resources leads immediately to a contraction of the self. The disruption of access to the Outlook calendar and contacts caused these problems precisely. Moreover, the employees attributed particular importance to their work-related information as opposed to their personal information, whose loss may cause grief, but does not include organizational responsibility.

In addition to the metaphors through which information was compared to bodily limbs or organs and to life itself, the employees recounted experiencing powerful feelings of panic and shock during the discovery of the malfunction. A critical event is defined as a sudden, unexpected event that has an emotional effect that challenges the usual, effective coping skills of a person or group (Caine & Ter-Bagdasarian, 2003). Such an event causes significant psychological distress in normally healthy people. It is thus possible to understand the employees’ emotions during the discovery of the malfunction. The event was unexpected and affected employees’ work routines and communication both inside and outside the organization. Another reason for panic and confusion was the blurring of boundaries between home and work. Personal meetings, contacts and correspondence were mixed with those of the organization. The seepage of the malfunction into one’s personal life intensified the fear of loss of information.

Control is a person’s belief in his or her ability to influence the environment or change it according to one’s will. A person experiences a sense of control when he believes that he can achieve his desired result through deliberate action on his part (Greenberger & Strasser, 1986). One of the problems with a technological malfunction that occurs at work is that employees have almost no control over it. Not only did employees have to depend on support staff to back up their information when it was lost; it was not clear what caused the malfunction, how long it would take to fix it and what the extent of the damage was. All this led to strong feelings of uncertainty and loss of control and trust in the system

Following their initial reaction, the employees recovered and found ways of dealing with the situation. They were frustrated by the difficulty they experienced, but managed to accomplish their tasks. According to the employees and the IT support staff reports, the organization and its employees did not suffer any financial or other major damages, and of course, no lives were lost. As one employee noted: “And then at some point I thought that, OK, it sucks, but it’s not like I’m in intensive care; no one is going to die from this” (Gila). Within a few days, data recovery was executed and the information lost was almost completely restored. Furthermore, the information that was temporarily lost was mostly workplace-related and the malfunction was not the fault of the employees. The intensity of the emotions expressed and the metaphors used may be attributed to the fact that, beyond the perception of technological devices and aids as an extensions of the body, the employees view the information itself as part of their bodies and their identities, and thus, they experience the loss of information as an injury to the integrity of their bodies and identities. The information that people collect is stored in external devices and applications as a supplement to human memory. When information is lost, people can feel as if something in their brain is missing, as argued by the cyborg anthropologist Amber Case (2010).

## 5.1 The significance of the research

Theories of self-expansion treat possessions, tools, and technologies as a continuation of the physical and mental body (Belk, 1988, 2018; Brey, 2000; Clayton et al., 2015; Downey et al., 1995; Ferraro et al., 2011; McLuhan, 1964; Sheth & Solomon, 2014; Verbeek, 2008). Studies from the last decade have discussed the role of the smartphone in people’s lives and the way it is perceived as part of their bodies (Case, 2010; Clayton et al., 2015; Emanuel, et al., 2015; Kruger & Djerf, 2016). This study continues the theoretical discussion of technology as self-extension and digital possessions as a central part of self-identity. The research was carried out among employees and may have practical implications for organizations. While it seems that the participants were very attached to their information and experienced mental anguish when they found out that it was lost, one should remember that most of these information items are actually not theirs, but rather the possessions of the organization they work for. It is thus important that information be properly organized and accessible to other employees if necessary. Better maintenance of the employees’ information will benefit the organization as well as the employees. Therefore, organizational training in personal information management practices is recommended.

Another recommendation for organization is to check and reexamine their back-up policy and practices. According to the IT support staff in this case, such a malfunction in Outlook is very rare, but rare malfunctions nonetheless occur and might have severe implications.

## 5.2 Limitations of the study

The malfunction at the organization was a rare opportunity to examine the perceptions of employees regarding the loss of their information. This is a medium size organization, where some of the employees used a different version of Outlook that was not affected by the malfunction. That is why only 15 interviews were conducted. In order to interview the employees while the experience was still fresh in their minds, an attempt was made to conduct the study quickly, close to the event. Therefore, the study was based on interviews only. A mixed study may have provided a broader view of the subject.

Many of the interviewees believed that their information was backed up and that a return to normal was only a matter of time. This fact could have biased their perceptions of the severity of the data loss. Despite these limitation, the strong feelings articulated by employees about losing their information even after the information was recovered may be further proof of the intensity of the emotions and the perception of information as part of themselves.

## 5.3 Recommendations for future study

This study indicates that employees perceive the information they have accumulated and maintained as a very important component of their professional identity and status. This perception may reflect the fact that they had just experienced their loss of information, while in their day-to-day lives people are not usually overly concern with their information items (Odom, Sellen, Harper, & Thereska, 2012). Mixed methods may contribute to a broader understanding of what influences employee perceptions. A survey, for example, can be used to examine variables that affect perceptions such as employee attitudes toward information policies, or previous cases of privacy violation.

# Conclusion

Employee training in personal information management practices can improve their information organization practices, raise their awareness of the vulnerability of their information, increase their sense of control and decrease the damage caused in the event that such malfunctions occur.

If employees perceive their digital possessions as extension of their body and identity and feel that losing them is like losing an organ or even life itself, as they presented it, then organizations should consider implementing information policies and PIM practice training not just for their own benefit, but for their employees' welfare as well.

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