

Reframing the Notion of Context in Information Systems Research

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Abstract

This article is about the notion of context that has received so much attention from the research field of information systems lately. At the core of the debate, according to Kuutti (1991), lies the question of how to handle contextuality in information systems design and research. Kuutti state that it now seems to be universally accepted that designing the technical core alone is insufficient, and that in order to design and implement successful systems some kind of context has to be taken into account – a context, which contains people and their relations. The question in this paper is therefore what is considered to belong to context, and what is the object of study for information systems researchers?

A review of some of the contextual approaches in information systems research is conducted. Based on this review it is argued that the contextual approaches reveal the importance of understanding more about the character of social influences on technology beyond the context of use and design. By reformulating the relationship between humans and technology as different forms of being-with-technology rather than using technology an expansion concerning the notion of context becomes possible. Such an expansion is suggested by an experientialist approach to information technology. With an experientialist understanding of information technology the context is understood as the shapes, forms, roles and wholes that people experience in their relationships with technology. This approach stresses the importance understanding more about peoples' relationship with technology beyond the context of use and design.

Keyword: Context, Information Technology, Experience

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1. Introduction

In this paper the notion of context is analyzed, as it is presented in some of the approaches within the field of information systems research, for instance participatory design, activity theory, distributed cognition and situated action. The assumption behind this article is that the recent focus on the context of information technology is a result of the emerging awareness of the social construction of technology. If technology is socially constructed then information systems researchers and practitioners must consider contextual aspects of IT-use.

The argument in this paper is as follows: In order to fully understand the implications and consequences of the social construction of information technology, researchers need to widen their focus beyond system developers' practice to a societal and cultural understanding. Such an expansion is suggested by an experientialist approach to information technology. By reformulating the relationship between humans and technology as different forms of being-with-technology rather than using technology, this approach stresses the importance of human experiences. With an experientialist understanding of information technology the context is understood as the shapes, forms, roles and wholes that people experience in their relationships with technology.

The paper begins with a review of some of the contextual approaches. Nardi (1996) is used as the point of departure but is complemented with some more pragmatic approaches that also have considered the notion of context in the design, use and research of information systems. Section three discusses the implications of the social construction of technology, and the dilemma that the content of technology seems to vanish in most of approaches that consider contextual aspects of information technology. It is suggested that this dilemma is a result of the pragmatic notion of research, whose objective is to improve practice. Furthermore, this objective for research prevents other forms of relationship between human and technology from being examined.

Based on an experientialist understanding of information technology, and also how such an understanding is related to information technology, an alternative to the discussion concerning context is suggested. This alternative is framed being-with information technology rather than using information technology. Understood this way human experiences of technology becomes important. The paper is concluded by a call for more elaborate studies of peoples' relationships with technology, that is studies that goes beyond the context of use and design. It is claimed that investigations of peoples' experiences of information technology are becoming increasingly important as well as new ways of capturing how these experiences are transformed in various relations with information technology.

2. Information Technology in Context

"Taking context seriously means finding oneself in the thick of the complexities of particular situations at particular times with particular individuals. Finding commonalities across situations is difficult because studies may go off in so many different directions, making it problematic to provide the comparative understanding across domains." (Nardi, 1996, p. 70)

The notion of context is currently a central concern for many researchers and system developers. This is mostly due to the fact that information technology often does not fit into the real-life context in which they are to be used by humans. As a result a number of ideas and approaches have been proposed to understand the nature of context of information technology. In this section I will try to summarize the main ideas and approaches, including, among others activity theory, situated action, distributed cognition, ethnomethodology. The outline of the presentation will, however, be according to some main ideas that are shared within most of the analyzed approaches.

2.1 Contextual approaches in information systems research

Nardi (1996) hold it to be especially difficult to isolate and emphasizes critical properties of artifacts and situations in studies that consider a complete context. What unites most of the approaches in the field, with regard to the study of context of information technology, is that they all share an understanding of context as something closely related to work practice and activities situated at work. Although this focus on activity is something that is shared among many of the approaches, it is in activity theory (Kuutti, 1991 and Engeström, 1990) that this is most seriously developed and expressed. They claim that what takes place in an activity system is the context.

According to the activity theory approach, context is constituted through the enactment of an activity involving people and artifacts. Since people consciously and deliberately generate context (activities) through their objects (goal/motive), context is not an outer container or shell inside of which people behave in certain ways. One key idea in activity theory, according to Kuutti (1991), is that the artifacts that are created by people to control their own behavior, also mediate activities. The artifacts are, in this sense, broadly defined to include instruments, signs, language, machines and information systems. Kuutti also claim that artifacts carry a particular culture and history and are persistent structures that stretch across activities through time and space.

Another approach that has similar ideas on the notion of context is the Distributed Cognition Approach (Hutchins 1995). The notion of context within this approach is captured by the cognitive system, composed of individuals and the artifacts they use. A cognitive system is, as Nardi (1996) recognizes, very similar to what activity theorist would call an activity.

"The cognitive system is something like what activity theorist would call an activity... While a distributed cognition analyst would probably, if pushed, locate system goals in the minds of the people who are part of the system, the intent is to redirect analysis to the systems level to reveal the functioning of the system itself rather than the individuals who are part of the system." (Nardi, 1996)

Although Nardi (1996) believes that a distributed cognition analyst would place the systems goal in the minds of people, Hutchins (1995) is striving against this traditional cognitive approach. He stresses the importance of getting the right functional specification for the human cognitive system by trying to at least partially dissolve the inside/outside boundary between people and the artifacts used. By moving the boundaries out beyond the skin of the individual and providing functional descriptions of processes that could account for learning and thinking Hutchins, holds that cognition in the wild is achieved.

".... seeing human cognitive activity as an integral part of such a larger system may bring us a different sense of the nature of individual cognition. Any attempt to explain the cognitive properties of such a larger system without reference to the properties of its most active integral parts would be deficient. Similar though, any attempt to explain the cognitive properties of the integral parts without reference to the properties of the larger system would also be incomplete." (Hutchins 1995, p. 287)

For both activity theory and distributed cognition, persistent structures are a central focus. Distributed cognition has however taken most seriously the study of persistent structures, especially artifacts. The properties of the artifacts are seen as persisting across situation of use, and it is believed that artifacts can be designed or redesigned with respect to their intrinsic structures, as well as with respect to specific situations of use. Practitioners of distributed cognition have, however, so far mostly been concerned with structures inside and outside the individual cognition, and the transformation these structures undergo. This is, according to Nardi (1995), very much in line with traditional cognitive science, with the difference that co-operation between people and artifacts are the focus of interest, not just individual cognition. Nardi (1995) further claim that distributed cognition tends to provide detailed analyses of particular artifacts, and to be concerned with finding stable design principles that are widely applicable across design problems. Another major emphasis of distributed cognition is on understanding the co-ordination among individuals and artifacts, that is, to understand how individual agents align and cooperate in a distributed process.

In the situated action approach (Suchman 1987), the focus of study is situated activity or practice. Although the central idea is still that context is related to activity, what is stressed in the situated action approach is that the structuring of activities is not something that is planned, but rather grows directly out of the immediacy of the situation. Therefore, the situated action approach asserts that the focus of inquiry should be the everyday activity of persons acting in a setting. Thus the basic unit of analysis of context is not the individual, nor the environment but a relation between two, i.e. the activity of persons acting in a setting. The setting is correspondingly defined as a relation between acting persons and

the arenas in relation with which they act. The situated action approach emphasizes responsiveness to the environment and the improvisatory nature of human activity.

Mantovani (1996), shares many of the ideas of situated action in claiming that action cannot be isolated from the situation in which it occurs. But Mantovani (1996) also shares the same emphasis on particular persistent structures that determine and contain valuable information and meaning for people using them. This also aligns him with both activity theorists and distributed cognition analysts. However, what his approach adds is a focus on interpretation and meaning.

"Life is not primarily a choice; it is interpretation. Outcomes are generally less significant—both behaviorally and ethically—than processes. It is the process that gives meaning to life, and meaning is the core of life." (Mantovani, 1996, p. 50)

This focus on interpretation and meaning, according to Button and Dourish (1996), is in most cases being used to inform design through either fieldwork investigations that develop an understanding of work and organizations from the inside, or through developing an understanding of the temporal organization of activities and interactions.

Many of the approaches also stress the importance of user involvement and participatory design. In that sense the various approaches also reflect what is traditionally called the Scandinavian approach, in which the user (client, customer) perspective is emphasized. The Scandinavian approach, however, holds the involvement of users to be a thoroughly political strategy: creating alternative technology centered round the worker's skills and interests. For instance Bødker et al. (1993) claim contextuality in IS design to be the political nature of the gap between designers and users, and users and technology. This emphasis on the political nature of contextuality is however often missing in approaches relating to the Scandinavian approach. Instead, the Scandinavian approach today is connected to approaches that stress the user/client perspective in design, collaborative design and/or design of groupware, rather than enhancing users skills at work. As Berg (1997) puts it:

"If there is a single thread through these accounts, it is the joint discovery of the user." (Berg 1997, p. 2)

This pragmatic notion of user involvement implies that it is necessary to discard irrelevant details, while isolating and emphasizing those properties of artifact and situations that are most significant for design. As presented above, this is often done by focusing on the activities in work practice that are performed by users and mediated by artifacts. Another pragmatic approach is Contextual Design developed by Holtzblatt and Beyer (1993). This approach also stresses the importance of user's experiences at the moment of use in developing information systems. The most significant part of this methodology is Contextual Inquiry, influenced by ethnomethodology and a technique to get data from users. Another is Button and Dourish (1996), who focus the particulars of everyday action and suggest a technological support for socially organized activities; Technomethodology. In this methodology, an integration of ethnomethodology and technological design is suggested.

2.2 The notion of Context in IS research

In this section various approaches to contextual design have been presented. Although the approaches to some extent are diverse and scattered and have different theoretical origins I hold some specific notions of context to be more or less shared. In examining the underlying assumption of what it is that belongs to context and what is considered to be the object of study in the presented approaches, I have found some similarities.

The first similarity is the assumption that context is something that grows out of activities. Although this is most heavily stressed within activity theory and distributed cognition, I hold many of the other approaches to share this assumption regarding context. In most cases the basic unit of analysis is, the activity that takes research beyond the traditional boundaries between computers and humans, towards a merger of technology and humans revealed by activities in practice. Different approaches differ, however, regarding if the activity is a system with predefined set of components (activity theory), or a system where the problem for researchers is to find the right functional specification (distributed cognition), or that the activities are structured in the particular situation (situated action).

Second, for the most part, users' knowledge, skills and experiences are important in informing designers about the specific context in which the information system is to be developed. In understanding users experiences and work-practice, ethnographic methods and ethnomethodology are often used, both in regards of interpreting and understanding users experiences as such, and also for understanding different meanings of technology in use. Thirdly, most approaches one way or another focus on what is temporal and what it is that is persistent within the context, i.e., the temporal and/or situational versus the persistent and/or stable character of context (activities). The situated action approach, for instance, does not acknowledge durable structures that persist over time and across different activities. In that approach, context is seen as situated, and durable structures that span situations are not central. In the activity theory approach and the distributed cognition approach there is the recognition of the value of situational research, although the persistent structures are more focused on, in those approaches.

Finally, all of the approaches seem to be based on the assumption that an understanding of contextuality is necessary to improve practice in some way. Either by being able to design systems more efficiently, or by making systems that are used the way they are intended to. These similarities can all be understood as revealing the importance of understanding more about the character of the social influences on technology. But as will be discussed in the next section, there are some underlying assumptions about the role of research, and the relationship between human and technology, that need further examination.

3. Information Systems Research; practice and object of study

"It seems as if researchers within information systems only consider two things as valid as goals for their research. Either they see research as a way of helping system designers in their practice or as a way of helping users or buyers to get what they want or need." (Stolterman 1995, p. 124)

The motive for studying context is, according to Nardi (1996), to conduct studies that will have value to designers who seek the expertise of researchers, i.e., research should aim at improving practice for system designers and/or users. But, even if practice is an important part, researchers of information systems need to put practice and information technology in a larger context, as a part of modern society. As Stolterman (1995) claims, practice should not be analyzed and judged by its own scales of measurement, but in relation to some overall values and ideals.

Another way of framing the current state of contextual activities in information systems research is that most of the efforts are taken place within the design and user context, whereas the environmental and cultural context for, the most part are not considered (Bush, 1983:157).

Stolterman, among others, argues the need for critical studies of technology in which the nature of information systems (IT artifacts) are studied and examined. The overall task for research, according to Stolterman, should be to stimulate reflection by creating and discussing ways to reflect and things to reflect upon.

"If a researcher studies practice he should not only try to depict what really goes on, he should also try to make unintelligible things and actions intelligible, make unseen things visible, make unproblematic things problematic, and maybe most important he should make well-informed statements about ethical and aesthetical consequences of where present practice will take us." (Stolterman, 1995)

In the previously discussed approaches there are however very few signs of taking research beyond practice. If I am right in my observation, that advocates of various approaches to contextuality, discussed previously, are interested in the social shaping of technology, why is practice not put in relationship with some overall ideals or values? A closer examination of the implications of an awareness of the social shaping of technology might provide some answers.

3.1 Implications of an awareness of the social shaping of technology

Social sciences have traditionally had an interest in the relationship between technological change and society. This interest, according to Button (1993), has often been related to technological determinism, i. e., that technology determines the development of social structures. The sociologist's interest has traditionally been understood as less concerned with questions about the constitution and organization of technology than with using

technology as a platform from which to observe the constitution and organization of the structural arrangements of society.

The more recent sociological interest of technology, however, has turned the focus toward the social factors that shape technology. This has led social scientist not only to focus on the effects that technology has on society, but also look at the effects that society has on technology. Within this interest, according to Button (1993), there have been two emerging schools of thought: the social shaping of technology and the social construction of technology.

These two schools share the desire to challenge the deterministic position, by arguing that technology is grounded in and constituted by socially operative forces. Also, both schools reject traditional sociological theories and methods and claim that they are inappropriate for capturing the constituting forces of technology. Instead, its various advocates argue that the content of technology itself is the sociologically interesting issue because it is socially shaped or socially constructed.

According to Button (ibid.), there is a danger that the argument that technology is socially constrained and shaped may run the risk of losing the very 'content' of technology it wishes to address. He suggests that instead of examining what it is about human activity and human interaction that makes technology a recognizably distinct phenomenon, technology is understood by those who design, make, use, write and talk about it. An analysis of those shaping forces can end up taking precedence, and technology itself can thus become merely another incidental area in which to observe these forces at work.

If studies done in terms of this announced interest in the content of technology are examined, it seems that the content of technology, far from being visible, has mysteriously vanished in the course of the investigation." (Button, 1993, p.15)

Button (1993) argues that the emphasis on the social construction of technology obscures the fact that the concept of technology is intelligibly used in our culture to orient to a particular domain of social life: the facticity of technology is displayed, accounted for, and testified to in participants' activities. Recognizing that technology is a socially produced phenomenon directs attentions to the details of its production and also allows the work, through which technology is socially produced, to be inspected for its' distinctive character.

By this, Button shares the assumption that the way of handling context within the field of information system is by concentrating and focusing upon the activities in which technology is constructed. The approaches discussed in section two, to some extent, are all studies of practical actions and interaction that are oriented towards technology. It is therefore possible to understand these approaches as empirical investigations of the social production of technology that are concerned with the way in which activities and interactions order technology.

Most of the approaches presented in section two regard contexts as something that grows out of peoples' activities. Also, most of them stress the importance of understanding the relationship between human and technology in order to improve the design and use of information technology. However, for the most part, the relationship between human and information technology is understood as a use-relationship, where humans are users of

technology. In this sense users need, want or should use technology in order to accomplish a specific task and technology is a tool, able to be design to effective use. Hardly any of the approaches focus on the indistinct, blurred or indistinct character of the relationship between human and technology, which is suggested as a result of an understanding of social shaping of technology.

3.2 From Using Technology to Being-with Technology

"A thing... is inseparable from its context, namely, its world, and from our commerce with the thing and its world, namely, engagement. The experience of a thing is always and also a bodily and social engagement with the thing's world." (Borgmann, 1984, p. 41)

One way of understanding the dilemma framed by Button, that technology seems to vanish when we focus on the social construction of technology, is by reframing our understanding of human relationships with technology. As suggested by Levén (1997:164), a contextual understanding of information technology implies that there is no obvious and clear border between an information system and its social surrounding. Instead we tend to form our surroundings into something unconscious and transparent that in relation to our bodies become resources in our actions. Understood this way the vanishing of the 'content' of technology emphasized by Button (1993) might just be consistent with a contextual understanding of technology.

Csikszentmihalyi (1981) has studied the relationship between humans and things. He states that people are what they attend to, what they cherish and use. The assumption in his study is that objects represent at least potentially the endogenous being of the owner, also that household objects constitute an ecology of signs that reflects as well as shapes the pattern of the owner's self.

"Household artifacts not only have meaning as individual objects but also form part of a gestalt for the people who live with them—a gestalt that both communicate a sense of 'home' and indicates the type of activities that are appropriate for different parts of the home... If examined closely it can reveal the patterns of attention that help to structure our everyday consciousness." (Csikszentmihalyi, 1981,p. 184f)

This way of understanding the relationship between human and information technology is also supported by much of the more recent developments of various experientialist technologies, such as information visualization, virtual reality, intelligent agents and so forth. Waterworth (1997), argues:

"With Virtual Reality, we make tangible the intangible, 'concretise' the abstract... This brings a profound change to our perception, and emphasises that, however useful it may be for action, mental life also has the primary purpose of experience, of imparting a sense of being... Because the technology does the work of abstraction for us... we are encouraged to reason concretely, which means to experience what it is to be... We are rediscovering that what gives life meaning is what it feels like, what it is experienced to be." (Waterworth, 1997)

Also Laurel (1993) gives reason to believe that our relationship with computers as tools should be questioned. She conceives of human-computer activity as designed experience and argues that our relationship with computers has extended the landscape of interaction to new topologies of pleasure, emotion and passion. Another is Turkle (1995) who after focusing on peoples experiences of life in MUDs (Multi-User Dungeons) are claiming:

"We are moving from a modern culture of calculation towards a postmodern culture of simulation.... Along with this movement come changes not only in what computers can do for us but in what they do to us—to our relationships and our ways of thinking about ourselves and our machines." (Turkle, 1995)

These experientialist tendencies are implying another relationship between human and technology that also stresses another way of understanding the notion of context. In this sense computers can be regarded as something different from tools and peoples relationship with computers not only as a use-relationship. At a more general level Mitcham (1994), also, discusses the mutual relationship between humanity and technology. He propose that the relationship between human and technology is a single thing, but something that can take many different forms:

"Rather than argue the primacy of one or the other factor or the cliché of mutuality in the humanity-technology relationship, we can better pursue understanding through a structural examination of three forms the relationships itself can take, three ways of being-with technology. (Mitcham, 1994:275).

Also Ihde (1977), claims, that for every change in what is seen, the object correlate. Thus there is a noticeable change in how (the experiential correlate) the thing is seen. Idhe has developed an analytical framework of four ways of being with technology. These are developed as co-relational schemes in which what is experienced (the noema) is strictly correlated with the mode of experiencing it (noesis). By this correlation scheme Idhe (1977) distinguishes four different relationships between human and technology that he terms embodied, hermeneutic, alterity and background relations.

"My thesis is that any use of technology is non-neutral. However, non-neutrality is not a prejudicial term because it implies neither that there are inherently 'good' or 'bad' tendencies so much as it implies that there are types of transformation of human experience in the use of technology." (Idhe, 1977, p. 66)

These more general studies of humans and artifacts suggest that people can have various relationships with their surrounding artifacts. I also understand these studies to be striving towards a different understanding of the notion of context. Based on this brief discussion I suggest an understanding of peoples' relationship *with* information technology as one of *being* technology rather than one of *using*. By understanding peoples' relationship with information technology as one of being peoples' experiences of technology becomes the foreground. In the next section, an experientialist understanding of information technology will be elaborated and the implication for such a notion of context discussed.

4. Towards an Experientialist understanding of Information Technology

"Men and women make order in their selves... by first creating and then interacting with the material world. The nature of that transaction will determine, to a great extent, the kind of person that emerges. Thus the things that surround us, are inseparable from who we are. The material objects we use are not just tools we can pick up and discard at our convenience; they constitute the framework of experience that gives order to our otherwise shapeless selves." (Csikszentmihalyi, 1981)

An experientialist understanding of technology, as suggested here, is concerned with the context of technology and how technological objects are interpreted and integrated into our social life. In this approach, as in previous approaches, activities play a central part. But an experientialist approach to information technology is interested in what is revealed by those activities—i.e., the forms of relationship with technology that people experience.

An experientialist approach to the notion of context also shares certain ideas with Lynch (1960). Lynch, who focuses on the visual quality of the American city by studying the mental image of that city which is held by its residents, is able to discuss peoples' experiences of cities through the concept of imageability. By such a concept a richer understanding of peoples' preconceptions of cities emerges. Imageability is, according to Lynch (1960:5), that quality in a physical object that gives it a high probability of evoking a strong image in any given observer. It is that shape, color or arrangement that facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment.

"A highly imaginable city in this peculiar sense would seem well formed, distinct, remarkable; it would invite the eye and the ear to greater attention and participation. ... Such a city would be one that could be apprehended over time as pattern of high continuity with many distinctive parts clearly interconnected." (Lynch, 1960, p. 9)

According to Lynch, the image of a city is the result of a two-way process between the observer and observed, in which the external physical shape which a designer can operate plays a major role.

An experientialist approach to information technology has also in various ways been discussed by, among others Brown and Duguid (1994), Ciborra and Lanzara (1994), Laurel (1993), Stolterman (1991), Turkle (1995) and Waterworth (1997). These approaches also to some extent acknowledge other relationships than use-relationships between human and information technology. Janlert and Stolterman (1997), for instance, refer to the collection of properties that a user experiences in using a specific computer application by advancing the idea of different *characters* of computer applications. Another approach is Brown and Duguid (1994), who claim that objects are inseparable from their context and as such stress the importance of understanding the interplay between material and social aspects of artifacts.

Furthermore, Ciborra and Lanzara (1994) suggest an understanding of peoples' relationship with technology through the concept of *formative context*. A formative context, according to them is:

"...the set of the preexisting institutional arrangements, cognitive frame and images that actors bring and routinely enact in a situation of action... A formative context designates what binds, in a loosely connected texture, an individual or a collective (group, organisation) to an established world of object and relations, and to the associated cognitive imageries, presuppositions and meanings of which that world is the embodied vehicle.... It is formative because it may help people see and do things in new ways, or, on the contrary, make them stick stubbornly to old ways." (Ciborra & Lanzara, 1994)

Ciborra & Lanzara (ibid.) claim that both organizational and cognitive dimensions comprise formative contexts. As such formative contexts constitute a background condition for action, enforcing constraints, giving direction and meaning, and setting the range of opportunities for undertaking action. Further the context is formative in that it shapes the ways people perceive, understand more, make sense, perform, and get organized in a situation bounded in space and time. Therefore they argue that context is directly related to the manner in which individual or collective experience is organized, and to choices and actions that can variously punctuate and modify the flow of experiences.

4.1 Concluding remarks

In this paper I have presented and analyzed some of the approaches to the notion of the context of information technology. By examine the similarities of the most basic approaches I have outlined a notion of context that calls for a different understanding of the relationship between human and information technology.

I have argued that the recent focus on context is a way for researchers and practitioners to better understand the relationship between humans and technology. Also I hold the present assumption concerning the relationship with technology to be a heritage from the pragmatic notion of research, where the goal for research is to formulate guidelines for better methods for designing information technology for use. This present way of handling contextuality within information systems research is too narrow. By focusing only on the design- and use-context, important aspects of the relationship between human and information technology are ignored. But if research should shift focus and move away from the pragmatic notion of research, other understandings of the relationship between human and information technology might be possible.

With an understanding of the relationship between human and technology as one of being-with technology rather than merely using technology, peoples' experiences become important. Moreover different understandings of the notion of the context of information systems are possible. In order to elaborate and explore an experientialist understanding of information technology, more studies need to be undertaken: studies where the relationship between human and technology is understood as emerging through peoples' activities not only within specific use- or design-contexts, but also in other contexts of social life. The objective for research

should also be clearly focused on generating a deeper understanding of peoples' relationship with information technology. In this paper I suggest that one way of attaining a deeper understanding is by focusing on peoples' experiences. That is of the experienced forms, roles and wholes that are emerging by with and through information technologies. Further investigations of peoples' experiences can also give systems designers new insights in how to design information technology in context, more importantly, such investigations can provide an understanding of the implications of the increasing computerization and virtualization of our society.

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