

2008

# About Time Too: Online News and Changing Temporal Structures in the Newspaper Industry

Matthew Jones

*University of Cambridge, m.jones@jbs.cam.ac.uk*

Kamal Munir

*University of Cambridge, k.munir@jbs.cam.ac.uk*

Wanda Orlikowski

*Massachusetts Institute of Technology, wanda@mit.edu*

Jochen Runde

*University of Cambridge, j.runde@jbs.cam.ac.uk*

Follow this and additional works at: <http://aisel.aisnet.org/icis2008>

## Recommended Citation

Jones, Matthew; Munir, Kamal; Orlikowski, Wanda; and Runde, Jochen, "About Time Too: Online News and Changing Temporal Structures in the Newspaper Industry" (2008). *ICIS 2008 Proceedings*. 156.

<http://aisel.aisnet.org/icis2008/156>

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2008 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# ABOUT TIME TOO: ONLINE NEWS AND CHANGING TEMPORAL STRUCTURES IN THE NEWSPAPER INDUSTRY

*Informations en ligne et changements des structures temporelles dans le secteur de la presse*

*Completed Research Paper*

**Matthew Jones**

University of Cambridge  
Judge Business School  
Cambridge, UK CB2 1AG  
m.jones@jbs.cam.ac.uk

**Kamal Munir**

University of Cambridge  
Judge Business School  
Cambridge, UK CB2 1AG  
k.munir@jbs.cam.ac.uk

**Wanda Orlikowski**

Massachusetts Institute of Technology  
Sloan School of Management  
Cambridge, MA 02142 USA  
wanda@mit.edu

**Jochen Runde**

University of Cambridge  
Judge Business School  
Cambridge, UK CB2 1AG  
j.runde@jbs.cam.ac.uk

## Abstract

*We examine how changes in information and communication technologies (ICTs) become implicated in temporal shifts within organizations. Specifically, we explore how the established temporal structures associated with the production of news are changing as news organizations expand their strategies from only printing traditional newspapers to also publishing online news. We identify a number of shifts in temporal structures in such organizations, and describe how these reflect neither technological necessity nor autonomous managerial strategy, but are constituted in and through the everyday work practices of editors and journalists, as these are shaped by the online medium. Our analysis suggests a number of important implications for understanding the temporality of ICT-mediated change in organizations.*

**Keywords:** Temporality, information and communication technologies, news, online media

## Résumé

*Nous examinons comment les changements des technologies de l'information et de la communication (TIC) ont des implications dans les modifications temporelles au sein des entreprises. Spécifiquement, nous explorons comment les structures temporelles établies liées au cycle de production des informations changent, depuis que les entreprises de presse adaptent leurs stratégies et impriment sur support papier et également en ligne.*

## Introduction

The ongoing development of online news services provides a particularly striking case of technology-mediated organizational change. Since the mid 1990s, many of the major media organizations in both print and broadcasting have established significant online news services, the readership of which typically exceeds that for their traditional services, in some cases by an order of magnitude. For print newspapers, in particular, online news has emerged at a time when the long-term problems of the industry have already been raising serious concerns about their future viability. Declining circulation, loss of advertising revenue and challenges to the authority and exclusivity of their services have given rise to claims such as “the public is voting with its feet: circulation continues to drop and today's newspaper owners find themselves managing a steady decline” (Fitzpatrick 2006), or, more strikingly, “newspapers are dead, but it will take a while for the body to cool down” (Kiss 2005).

Despite significant changes in the news industry associated with the emergence of online news, this phenomenon has received relatively little attention even in the journalism literature (e.g., Ahlers 2006; Ahlers and Hessen 2005; Dimitrova and Neznanski 2006; Tewksbury 2006), and almost none in the management and information systems (IS) literatures (for some exceptions, see Boczkowski 2005, Clemons et al. 2002-3, and Poor 2007). The relative absence of such consideration in IS research is perhaps particularly surprising given that online news is, by definition, a phenomenon that has been made possible by the rise of the Internet. The current major transformations in the news industry would thus seem a particularly rich site for examining the role of information technologies in organizational change, especially since information is so central to the industry's activities.

With this paper, we attempt to address some of the lack of research attention paid to online news in the IS literature. In particular, we report on an empirical study that examined changes in the temporal organization of work practices associated with the move to online news, and the role of information and communication technologies (ICTs) in such changes. The focus on temporality and work practices emerged as a significant dimension of difference between traditional and online news in interviews with leading players in the industry. Our paper contributes to an understanding of the specific temporal structures associated with the generation of online news and how these depart from those evident in traditional news production, while also providing some insights into the temporal aspects of ICT-mediated organizational change more generally. Given that transformations in work practices are associated with the Internet in many other industries, the findings about temporality and technology articulated here may also be of relevance beyond just the news industry.

In order to set the context for the analysis of changing temporal structures in the news industry, we first consider how time has been conceptualized and characterized in the organizational and IS literatures and how these characteristics may be affected by ICTs. We then present evidence from a field study that we conducted into the news industry, highlighting changes in the temporal organization of work practices associated with the introduction of online news. Analysis of our data focuses on the change process, emphasizing continuities as well as discontinuities in the temporal structuring of work practices, and the role of ICTs in mediating this change.

## Literature Review

The past decade has seen considerable management interest in the temporal implications of such contemporary pressures as globalization, technological innovation, and uncertainty. Specifically, attention has focused on accelerations in the pace of organizational activity (e.g., speeding up of information transfer and processing); reductions in cycle times (e.g., decreasing “wait times” in business processes); shifts in when and where work is performed (e.g., distributing working geographically); changes in the significance of deadlines (e.g., generating expectations of immediate response); and intensification of work experience (e.g., increasing the availability and accessibility of people, products, and services) (e.g., Cusumano and Yoffe 1998; Fine 1998; Gleick 1999; Green 2002; Hongladarom 2002; Whipp, Adam, and Sabelis 2002; Yeh et al. 2000).

Reflecting this interest in temporal matters, research on time has recently attracted considerable attention in the organizational and IS literatures with special issues in such journals as the *Academy of Management Review* (2001), *Work and Occupations* (2001), *The Information Society* (2002) and *Organization Studies* (2002), as well as a related collection of papers in Whipp et al. (2002). A major theme in this growing body of work reflects the earlier sociological literature on which it predominantly draws (e.g., Adam 1995; Hassard 1989; Jaques 1982), and relates to how time is conceptualized and characterized in research practice.

Ancona et al. (2001) note that while a variety of times are discussed in the management literature (e.g., clock time, cyclical time, event time, and life cycles), these different types are often reduced to two, polarized positions (Jaques 1982): one that sees time as linear, continuous and directional and the other that sees it as particular, punctuated and cyclic. The first position is generally associated with a universal, quantitative and objective “clock” time that predominates in “modern” societies, and the second position emphasizes relative, qualitative and subjective “event” time, seen to be typical of “traditional” societies.

The organizational literature characterizes the temporal performance of activities on a variety of dimensions. Following Zerubavel (1981), for example, temporal regimes have been differentiated in terms of their sequential structure, duration, temporal location (when situations or events are expected to take place) and rate of recurrence. Schriber and Gutek (1987) propose an extensive set of interpretative dimensions to characterize temporal norms within organizations, including deadlines, punctuality, autonomy, reutilization and future orientation. Ancona et al. (2001) observe that such typologies combine categories concerned with *dimensions* of single activities (such as scheduling and rate of completion), with the *transformation* of single activities (such as life cycles and transitions), and the *relations* among multiple activities (such as time allocation, ordering and synchronization). A further aspect of the time organization of multiple activities proposed by Hall (1983) that has been applied to organizational life is the distinction between monochronic and polychronic views of time, referring to whether multiple activities are carried out one at a time, or undertaken simultaneously (Bluedorn 2002; Leidner and Kayworth 2006).

A number of the concepts and dimensions with which to describe changes in the temporal organization of work provided by this literature have been taken up by IS researchers to analyze specific changes that are seen to be associated with the introduction of ICTs (e.g., Kavanagh and Araujo 1995; Maznevski and Chudoba 2000; Nandhakumar and Jones 2001; O’Leary and Cummings 2007; Sahay 1997; Saunders and Ahuja 2006; Saunders et al. 2004; Sawyer and Southwick 2002; Scott and Wagner 2003). A major contribution to IS research on time has come from Lee in a series of papers (1999; 2003; Lee and Liebenau 1999, 2000; Lee and Whitley 2002) that have explored the effects of IS along a range of temporal dimensions. In particular, Lee and Liebenau (2000) draw on both Zerubavel (1981) and Schriber and Gutek (1987) to identify six dimensions on which ICTs affect the temporality of business processes: duration, sequence, temporal location, deadlines, cycle and rhythm. The commentary by Saunders and Kim (2007) includes a useful classification of various temporal measures evident in recent papers published in the *MIS Quarterly*.

Castells (1996) goes further in arguing that ICT-related changes in work represent the emergence of a new temporal regime that he terms “timeless time”. In contrast to the linearity and regularity of “clock” time, or the socially embedded pacing of “event” time, “timeless” time is seen to be marked by random discontinuity, arrhythmia and acceleration. It is thus simultaneously both *eternal*, standing outside conventional notions of sequencing with all phenomena equally, and instantly, accessible, and *ephemeral*, in that any perceived temporal ordering of phenomena in this undifferentiated vista will be context-specific. Similarly, McNaughten and Urry (1998) refer to the dominant forms of time associated with electronic communication media as being a combination of both “glacial” and “instantaneous” time (in contrast to the more traditional associations of clock time with written media and social time with oral media).

From the point of view of our interest in the temporality of work practices, these various literatures have provided valuable insights into a number of aspects and dimensions of temporality, including how the introduction of ICTs may speed up of activities towards instantaneity (Castells, 1996), or alter temporal patterns in organizations and create tensions with established work processes (Sawyer and Southwick 2002; Scott and Wagner 2003). However, much of the literature reflects — whether implicitly or explicitly — dualistic conceptions of time (especially a dichotomy between clock time and event time). Furthermore, this literature treats these different temporal regimes as discrete and incommensurable. We may summarize the main types of temporality associated with contemporary ICTs in terms of the following characteristics (see Table 1).

<b>Table 1: Types of Temporality in the Literature</b>	
<b>Type of temporality</b>	<b>Characteristics</b>
Objective/ Clock	Linear, quantitative, natural, universal, continuous, directional
Subjective/Event	Cyclical, qualitative, socially constructed, local, episodic, relative
Timeless	Simultaneous, accelerated, ephemeral, discontinuous, eternal

Presuming distinct and incommensurable forms of time and temporal regimes is limiting in that it does not allow us to understand how people may participate in multiple temporal forms and regimes. As Orlikowski and Yates (2002, p. 690) note:

“The designation of clock-based and event-based times as distinct often breaks down in practice. Because both are human accomplishments, people routinely blur the distinctions between the clock and events, organizing their activities in terms of both clock time *and* event time (rain dates being a simple example).”

Our empirical study of online news indicated that such temporal blurring and multiplicity was evident in practice. We thus found the temporal structuring perspective proposed by Orlikowski and Yates (2002) to be a useful framing to make sense of our data in this research. In contrast to viewing time as discrete or fixed (whether understood as objective or subjective), Orlikowski and Yates draw on practice theory (Schatzki, 2001) and structuration theory (Giddens 1984) to propose that “people in organizations experience time through the shared *temporal structures* they enact recurrently in their everyday practices” (p. 686). As such, temporal structures are both the medium and outcome of individuals’ everyday practices. Human actors, therefore, experience time neither as exclusively clock-based, nor as exclusively event-based, but as both, with perhaps one being more influential at any particular moment (e.g., an illness may override a deadline). These categories, moreover, themselves include multiple, and perhaps conflicting, temporal structures (e.g., daily, weekly and annual routines, diverse personal, cultural, and religious events) that shape (and are shaped by) individuals’ practices.

This form of structural perspective on time would appear to offer a way of transcending given assumptions about the nature of time or the role that social actors can play in temporal change. While they illustrate their argument with an example involving the use of electronic media for communication, Orlikowski and Yates (2002) do not specifically address changes in temporal structures, the possible influence of ICTs in such changes, or the role of network time, as identified by Castells (1996). Examination of temporal change in the news industry would therefore seem to provide an opportunity to develop a temporal perspective on ICTs in the workplace by extending the approach of Orlikowski and Yates (2002) in two ways: first by exploring the emergence of new or altered temporal structures in an established work setting, and secondly by considering how ICTs may be seen to be implicated in this process and with what consequences.

## Methods

Our field study into news production collected a range of different data, from interviews with news producers and consumers, to observations of news operations, and documentary review of published news (print and online). On the news production front, we conducted semi-structured interviews with senior figures in the print and online divisions of a number of UK and US newspaper and broadcast news suppliers. In total, 20 individuals were interviewed in 9 different organizations (5 broadsheet newspapers: *Guardian*, *Telegraph*, *Financial Times*, *New York Times*, and *Wall Street Journal*, and 4 broadcasters: *BBC*, *Sky*, *ITN*, and *ABC*). Additional data were gathered through observation of work practices at 3 online news offices with detailed field notes used to capture these data. Interviews typically lasted from one to one and a half hours and were audio-recorded and transcribed. The transcripts were then coded using *NVivo* qualitative data analysis software, focusing on themes relating to the temporalities associated with news production and consumption in traditional and online settings.

We also collected data on news consumption by interviewing 15 subscribers to the *Financial Times Online* (all prior readers of the print edition of the *Financial Times*), both before they started using the online news service and three months later. All these interviews were also recorded and transcribed. Finally, we also sought documentary data by collecting the front pages of 7 print newspapers for a week, and taking screenshots of their corresponding websites twice a day (in the morning and evening) for the same period. The papers involved were the *Financial Times*, *Telegraph*, *Times*, *Independent*, *Guardian*, *New York Times*, and *Boston Globe*.

We used an exploratory approach in our data collection and analysis (Eisenhardt 1989; Glaser and Strauss, 1967; Miles and Huberman 1984), oriented by a focus on temporal practices. Our analysis consisted of multiple readings of the interview transcripts, field notes, and documentary data. As part of these readings, we identified and interpreted references to temporality, and the temporal structures that appeared to shape informants’ work practices. The process of interpretation itself was iterative, moving between our data and emergent temporal concepts. We were particularly interested in understanding the temporal practices that structured the production of online news and how these differed from those shaping the production of print news. This iterative and comparative process

generated a set of themes characterizing the temporal structuring associated with using ICTs to produce online news. In particular, we found that the temporal norms and expectations entailed by online news practices — in contrast to those entailed in the production of traditional print newspapers — are orientated towards increased speed, frequent updates, and succinct but diverse content. We discuss these and their consequences below.

## Temporal Structuring in the Newspaper Industry

### *Background*

The first regular newspapers began to appear in the 17<sup>th</sup> century, but it was not until the growth of mass circulation daily newspapers in the mid 19<sup>th</sup> century that a significant news industry developed. Newspapers survived, despite the emergence of competing news sources, first radio and then television in the 20<sup>th</sup> century, and with the popularization of the Internet in the mid 1990s, many newspapers sought to extend their brands to the new medium by launching online editions.

In the UK, early players in the sector were sites associated with daily broadsheet newspapers, such as the *Telegraph*, *Guardian*, *Times*, and *Financial Times*, and broadcasters, such as the *BBC* and *ITN*. The same pertained in the US, where major online news players include newspapers such as the *New York Times*, *Washington Post*, *Wall Street Journal*, and *LA Times*, and a number of broadcasters such as *CNN*, *ABC*, and *NBC*. A third category of online news sites is that of news aggregation services — such as *Yahoo News* (launched in 1995) and *Google News* (launched in 2001) — that do not originate their own stories, but collate items from press agencies (wire services) or stories from other websites. A fourth, and most recent category, is that of online citizen journalism. Here content is provided by users of the website, as evident in such examples as *OhmyNews.com* and *NowPublic.com*, as well as the hundreds of news blogs proliferating around the world.

Initially, a number of the online newspaper sites were set up as relatively independent operations, with an eye to eventual flotation during the dot com boom, but were subsequently brought in-house in various configurations from sub-departments of the main news operation to distinct organizational units with equal status to traditional news units. This led to efforts to integrate print and online operations, with journalists writing stories for both media (joint filing). These were often hindered, however, by organizational and technological problems, such as staff skills and perceptions of status and technical incompatibilities between the newspaper and online computer systems.

Online news on newspaper sites thus has a close, but complex, relationship with print production (Dimitrova and Neznanski 2006). The traditional print newspaper provides the context from which online news emerged and within which it generally continues to operate. It is also seen by some print journalists as a competitor for readers and advertising. In order to appreciate the changes in temporal structures associated with the advent of online news, therefore, it is helpful first to understand how news production is organized in traditional print newspapers, before turning to consider the production of online news.

### *News Production in Print Newspapers*

Figure 1 shows the front page of a typical print broadsheet newspaper (in this case, from the *Guardian* as published on June 10, 2006). While there is some variation among different news organizations, the production process of print newspapers generally follows a regular daily timetable, which has changed little since the 19<sup>th</sup> century (Marr, 2004). While the early news desk team start work at 7am, selecting potential stories to be covered in the next day's newspaper, the content of the day's paper is largely set at the Editorial conference at 10.30 am (unless a major unexpected event, happens during the day). Chaired by the Editor, and attended by the heads of each unit (such as the news desk, foreign desk, and picture desk) the morning conference decides the emphasis and angle to be adopted on different stories in that day's newspaper. Stories and features are assigned to individual journalists, some of whom are specialists in particular areas such as law, transport, or science, while others are generalists. When journalists have written their stories, these are checked by the "back bench" of sub-editors for style and accuracy and, if necessary, reduced to fit the space available. Newspaper lawyers may also check stories for any potential legal implications.



Figure 1: Front page of the Guardian newspaper (June 10, 2006)

A first proof of the edition for complete review is run off at about 7 pm and further changes may be made before the newspaper is sent to the printers at about 9 pm. Early print runs are for distribution to remote regions of the country, and the content may continue to evolve through subsequent editions, the last of which is sent to the printers at about 2 am. This production process is managed by the “back bench”, lead by a Night Editor. Table 2 shows this traditional highly institutionalized timetable for producing print newspapers.

Time	Activity
7 am	News Desk start work
10.30 am	Editorial conference
1 pm	Back Bench start work
4.30 pm	Sub-edited stories signed off
7 pm	First proof edition
9 pm	First edition sent to printers
10.30 pm	Second edition sent to printers
11.30 pm	Third edition sent to printers
2 am	Final edition sent to printers

The content of newspapers is therefore largely fixed by 7 pm,<sup>1</sup> and any events that occur after 2 am will have to wait to be reported in the next day’s paper (the first edition of which will only start to go to the printers some 19 hours later). As one senior editor put it:

“There’s nothing you can do on [a news story] from 2am until 9pm. You can do anything you like during that time, but it only matters what you’ve got at 9 o’clock.”

<sup>1</sup> Some newspapers, such as the *Financial Times*, publish separate editions for different geographical regions, but these are staffed separately. Moreover, although stories can be shared between regions, the extent of such sharing tends to be limited in practice, since the reason for these editions is to address what are perceived to be different regional news agendas.

As a result, he continued, newspapers recognize that,

“... news is no longer really the currency of newspapers at all. News is not what newspapers are about; it’s really about ... editorial priority ... and it’s about comment and analysis.”

On this view, the value of newspapers lies in the perspective that editors and journalists bring to the reporting and discussion of particular events that they deem to be significant, rather than in alerting readers to the occurrence of events per se.

The daily routine of a newspaper thus has a clear pattern.

“Our reporters, print-based journalists, are used to getting their stories in by 6 o’clock for a 9 o’clock deadline for the next day’s paper”.

“They have a once a day deadline in their mind, that actually determines how you work”.

Individual journalists’ days therefore are very structured, with a regular rhythm, building up to a common daily deadline. While this is seen to promote a sense of teamwork it also associated with a long-established culture of the hard-drinking, cynical “hack” journalist (Marr, 2005).

The time that print journalists and sub-editors spend writing and checking a story is seen to be necessary because, as one editor noted, “if they get something wrong, its in print forever”. Time is also available during the day to make checks and pursue details:

“If you work in the print industry you are sitting there and it’s 4 o’clock and you know that the button gets pressed at a quarter to eight ... You say I’ve got three hours in which to work on this and they could be reading it tomorrow morning ... [so] I can now make 15 phone calls in order to get the depth and context that I need”.

This concern with getting things right is often reinforced by the reputation of the paper, especially if it aspires to be a “paper of record”.

### News Production in Online News

Figure 2 shows the front screen of an online news website (in this case, from the *Guardian* on June 10, 2006).



Figure 2: Front screen of the Guardian online news website (June 10, 2006)

The production of ICT-mediated online news differs quite substantially from that of print news. Online news services often do not have reporters of their own, but get their stories from the print edition of the newspaper, or from news wires and other secondary sources (such as television for the newspapers). Online journalists therefore typically start their shift in the evening (6 to 10 pm) working through until the last print edition is sent off (2 to 3.30

am), taking stories from the computer system for the print edition and editing them for the web. A production editor then puts the stories onto the website.

Once these stories are up on the site, there will be perhaps one person maintaining a breaking news presence until the morning online team starts work at about 8 am, taking stories from the news wires and developing them for the paper's website. This is seen to be necessary to sustain readers' interest in the site.

"In the morning we use a lot of the [newspaper] stuff because it's new and it's fresh but by noon time, the stuff in the [newspaper] is getting a little stale ... for our online audience, so we tend to use more wires stuff.

The work rhythms and pace of online and print journalists are thus quite different, as one online editor commented:

"If you walk on the newsroom floor of the paper, it's empty. Here [on the online side], between 8.30 and midday it's manically busy."

In contrast to the production of print and online news, we identified three shifts in the temporal norms and expectations associated with the production of online news. All reflect the influence of ICT-mediation on the production of such news, specifically: *a shift in pace*, emphasising speed; *a shift in frequency*, reflecting increased updates; and *a shift in content*, incorporating brevity and diversity of material. We consider each in turn.

### ***Shift in Pace: More Speed***

A major focus of online news is on speed. One online editor noted that "the fight to be first is now something that we feel". Indeed some sites have pursued speed as a source of competitive differentiation, as another editor noted:

"We prided ourselves on being the fastest. I did say, 'We can't be the most comprehensive, because we don't have all the tools for it, but I want to be the fastest'."

To this end, the editor's news organization had developed its own "single file deploy" software to enable the update of individual online stories within 12 seconds.

Given the focus on speed, there is not the same sense of a common daily deadline, however, and for some journalists and editors this made the work more continuously stressful, as one online editor explained:

"You don't automatically get the teamwork and you don't get the energy building up to a point in the day and then relaxing. So it can be much more strenuous in a way because it is a constant level of stress. [...] For us, there is no single deadline, every story has its own deadline: as soon as you can do it. So there's no point of collective experience or peer review and that's a significant downside."

A couple of editors commented that this made producing online news more like producing broadcast news (e.g., on television) than producing print newspapers:

"In fact the broadcast model is a much more effective one for online news than the newspaper model."

"Online is a very stimulating environment for a print journalist, because its the closest I've ever been to broadcasting,"

The emphasis on speed and no single deadline on the online news side was seen to potentially feed back into print journalism:

"It's becoming increasingly important that people who see themselves just as newspaper journalists, start to break that perception, start to think about ... a newspaper as a living thing, rather than a deadline-driven, once-a-day, printed edition."

One way that online news websites manage the "need for speed" is to occasionally prepare stories ahead of an expected event, such as a court verdict or the announcement of a general election, so that they can "go live" immediately the event has occurred. For example, in the case of a court verdict where there may be more than one possible outcome (e.g., guilty/not-guilty), two versions of the story would be prepared and "put out on the ether". That is, both possible sides of the story would be posted to the website's servers, but with no link established from the news website itself. Once the verdict is announced, the story is made "live" in a matter of seconds by inserting a link to the "correct" version already in place on the server.

The speed of online news production was also evident in the extent and immediacy of interaction with readers, as one editor noted:

“There is a kind of excitement with the web that you can put something up and within five minutes reactions are coming back.”

### ***Shift in Frequency: More Updates***

Responding to the perceived demand for up-to-the-minute news, all online sites frequently updated their news content. Many also included a “news ticker” with the latest headlines (linked to stories on their sites) and many offered personalized email or mobile phone alerting services to notify readers of breaking stories of particular interest to them. Commenting on the frequency of updating, one senior online editor claimed that:

“During the day, from 5 or 6 am till midnight, ... there isn’t a minute that a news story or an updated story wouldn’t be published”.

Frequent updating was also evident in our comparative analysis of print and online front pages/screens, which found that the headlines for the lead stories had changed from the morning to the evening online versions on more than 90% of news websites. Even where the headlines were the same, the stories or links associated with them had typically changed, offering different kinds of information, perspective, or analysis. Online editors argued that this frequency of updating was necessary because it was expected by their readers. As one put it:

“People come to the [newspaper website] round the clock, 24 hours a day because they want it immediately”.

Two trends were identified as reasons for this change in readers’ expectations: growing international readership of online sites, and increased flexibility in the temporal organization of readers’ lives. These shifts are seen to be associated with people accessing online news sites at many different times of the day.

With major breaking news stories, online sites can take full advantage of this updating capability to track events as they unfold. One editor described the unfolding of events on the day of the September 11 attacks:

So we are just literally building as the day goes on. And [...] 24 hours from 2 o’clock [GMT], I think it was [that] it began, ... right the way through the night ... we published 148 times.

Given the speed at which online news is now being published, it is deemed infeasible to perform the detailed sub-editing, legal checking and editorial control associated with a print edition. As a senior online editor commented:

“[with the print edition] the whole thing will be honed and they’ll get towards a perfect product at the end of the night. With me, I just came in and said ‘it’s a great story, go live with it there now’.”

Similarly, another online editor noted “we are starting to get the idea of scrappiness and immediacy being better than polish and presentation,” although there was also a growing recognition that this could lead to errors:

“immediacy ... is not necessarily journalistically a great thing, because you ... run the risk of getting things wrong.”

This was considered acceptable, however, because errors could be easily corrected. Two editors commented:

“If you get something wrong, your pal is going to check it and it’s going to be changed within five minutes, so I’ll never see it.”

“The good thing about the web is, of course, we could fix it if we have to. Newspapers can’t, so you’ve got one shot to get it right. If we [online] make a typo or something, we just change it and then it’s like it never happened unless somebody catches a screenshot or something.”

For this reason, some print journalists saw online news as ephemeral. However, such views were contradicted by the presence on most online sites of fully searchable archives. As one editor explained: “typically news stays live for 48 hours, maybe. And then we go to the archive”. Once archived, moreover, online news departments were reluctant to change stories, unless there were typographical or major factual errors. An editor noted:

“There’s a tremendous ethical thing about changing history, so I won’t go in there and improve a story ... What we don’t do is later revise things, because it acts as an archive. I’d like to think that you can click on that day and that’s the [newspaper] and that’s what it said.”

Online stories are therefore generally more constantly and easily accessible than those in print. This may have interesting effects, for example, on journalists’ writing style, as one editor explained:

“We don’t use ‘today’ in the web site, so if you’re reading the paper, and you’re saying that’s what’s going to happen tomorrow, you write ‘today’, because you’re assuming that people are reading it, any time, but today. But we don’t make that kind of assumption on the web site.”

It also, as one editor noted: “allows people to compare things that you wrote then with now,” with potential effects on journalists’ accountability.

More significantly, perhaps, in the UK, “contempt of court” legislation restricts the publication of material that could impede or prejudice active legal proceedings, as an editor explained:

“anything that’s in an archive is continuously published ... so you have to purge your archive of anything that has to do with X or Y court case.”

A related issue was that of libel, because online stories are considered to be re-published every time they are viewed:

“The biggest libel issue is on the re-publication, because obviously you publish a story once in the paper and it’s there. There is no argument that it may be on a microfiche in the library or someone can go into an archive. The law’s never dealt with that; but every time someone clicks on a story, if we have it live in the archive, it re-ignites the limitation period, because, at the moment, as you know, you can only sue within the year.”

In such cases, online sites frequently deleted stories from their site to avoid the risk of legal action, thus undermining the sense of a “complete archive” and, at least, in these cases, “changing history.”

### ***Shift in Content: Less Text, More Links***

The ICT-mediation of online news with its increased pace and frequency of updates affords a shift in the content of stories published on news websites. News reports tend to be shorter, there is a focus on breaking news and the online websites incorporate numerous links to a variety of related and contemporary services.

The speed with which stories were produced means that they tend to be much shorter than those in the print edition, as a number of editors explained:

“You’re probably more likely to have someone who is a web person doing lots and lots of small stories very quickly,”

“When we first started asking the [newspaper] to give us things on breaking news, so we would say, ‘give us a story on that’ and they would go back and they would write a 15-inch newspaper story, and someone would copy edit it and we would get it 2 hours later We want one paragraph, we want one sentence, and that’s how we cover news,”

“Each medium has its own definition of news ... So we are not writing full stories, but we are writing what we call “breaking news boxes”. So somebody’s sitting there dashing up a paragraph or whatever, and if you add all those up, they would be far more than a regular story. But it’s just that we’re doing it in 2-minute increments and we’re only putting up little bits at a time”.

A few sites had codified the expected length of online stories. For example one editor reported:

“For standard news story, it’s very stylized. You have the 30 character headline; you have a paragraph to summarize ... you then have a four paragraph version that can’t exceed 137 [lines], I think.”

According to another editor, the brevity of online stories reflected readers’ preferences:

“Most people over the age of 27, they don’t like reading anything more than about 800 words on the screen.”

There was also a pragmatic justification for short stories, however, as one editor described:

“another reason for that, of course, is that you couldn’t get too many things wrong in short [stories].”

Not all online stories were necessarily brief, and most sites also provided links to more in-depth stories, either drawn from the newspaper, or specifically developed for the website. Thus as one senior editor commented: “what [the website is] offering is speed allied to infinite depth.” Another noted:

“If we just put the printed article out, lots of people would come and look at it, but it would not be a great website. We would be a printed archive that’s online. What makes the site is

the idea that you can go and talk about it, you can catch updates, or you can be shown articles that we have that are linked, that we've thought about ... [and] that makes a complete difference.”

Whatever the length of the story, moreover, online sites emphasized that they needed to reflect the established values of the parent newspaper. An editor explained “if you read the [online site] and you read the [newspaper], there should be no distinction.”

## Discussion

The emergence of online news may be seen as contributing to a wide range of changes in the temporal patterning of work activities in the newspaper industry. These may be characterized using the dimensions proposed by Lee and Liebenau (2000) as shown in Table 2. Thus the duration of tasks in print production is geared to a strong daily cycle with a clear rhythm building up to a collective deadline. Within this daily routine, different activities follow a regular sequence with specific temporal locations tied to a clock-based timetable. Sequencing in online news production, in contrast, appears to be less important. Activities, such as checking, seen as critical in print production, are often omitted, while the order of others may be reversed (such as correcting a story after it has been published). Some activities, such as putting the paper on the web, still have a specific temporal location, but much online news production happens at any time and is greatly accelerated compared to print news. Each story has its own deadline (i.e., as soon as possible), creating a rapid, unsynchronized rhythm of work. With frequent updating the cycle time for story production and removal is also greatly reduced.

<b>Dimension</b>	<b>Print</b>	<b>Online</b>
<i>Duration</i>	variable over course of day	accelerated
<i>Temporal Location</i>	strong	only for some activities
<i>Sequence</i>	strong	partially disrupted
<i>Deadline</i>	significant, collective	more, less important, individual
<i>Cycle</i>	daily	rapid
<i>Rhythm</i>	daily build up	frequent, repeated

Online news production is also more polychronic, with multiple activities occurring at once, compared to the sequential, monochronic print environment. This difference is associated with greater multi-skilling of online staff, in contrast to the traditional division of labour in print production.

Many of the temporal shifts associated with online news production are in line with Castells' (1996) account of “timeless time,” seen to be associated with the influence of ICTs. Thus, online news production with its potential for continuous updating and its emphasis on speed and immediacy (both of news delivery and feedback from consumers) may reflect an acceleration of time experience. The traditional sequencing of print news production over the course of a day gives way to unsynchronized activity of sporadic intensity, only partially geared to any timetable. The news itself becomes similarly disconnected from its traditional linear sequence, with the “infinite depth” of online coverage making all stories comparably accessible, just a few clicks away. In addition to bringing the past into the present in this way, the frequent updating of online news sites creates an image of impermanence and the practice of putting stories “out on the ether” awaiting expected events, brings multiple futures into the present. Online news may thus be seen to reflect elements of both the eternal and the ephemeral. This lack of a consistent temporal frame of reference also feeds back into the writing of online stories as journalists avoid relative time references to reflect the uncertainty about when readers may access stories.

While there are clearly some significant differences in the temporal organization of print and online news production, focusing just on these might be seen to imply that the two temporal regimes are independent of each other and that the changes are primarily, or even exclusively, a consequence of the new technologies involved. In the following sections, therefore, we will discuss temporal structuring and on the role of ICTs in this process.

### ***The Temporal Structuring of News Production***

Following Orlikowski and Yates (2002), we consider three ways in which the temporal organization of news production (in both print and online) is structured: first, in terms of the production and reproduction of temporal structures through participants' everyday actions; second, in terms of the establishment of new temporal norms; and third, in terms of the distinctiveness of conceptualizations of time, especially the timeless time seen to characterize the "network society" (Castells 1996)

The long history of print news production has contributed to a strongly routinized patterning of work activities, as illustrated by the daily timetable in Table 2. This has had a powerful influence on the practices of print journalists, such that the pacing and character of their work activities (and, perhaps their work culture) are closely linked to the daily rhythm, making it difficult for some print journalists to adjust to the different temporal pattern of online news.

The relatively recent emergence of online news, and the continuing technological and organizational changes associated with its structuring, suggest that patterns of work for online staff are not (yet) as strongly institutionalized as those of print journalists. Nevertheless, we observed a significant degree of convergence in online temporal structures across different companies. Specifically, all online news sites were characterized by a high tempo of work to meet frequent, short deadlines with fewer organizational controls.

Notwithstanding the routinization of print news production, the temporal patterns we observed were neither inevitable nor immutable features of news production. Thus alternative temporal structures could, and did, emerge in response to the opportunities offered by online news. In part, this was a result of the recruitment of new staff (from broadcasting and elsewhere), many of whom had limited experience of print journalism and were therefore less accustomed to its culture and routines. It also reflected the initial independence of online news organizations, which afforded it some degrees of freedom relative to the institutionalized world of print news production. The temporal patterns of online news production also evolved through the transformation of existing structures. In this they may have been facilitated by the existence of similar working arrangements in the broadcasting sector of the wider news industry, as interviewees noted. Individual journalists, however, were capable, as several interviewees demonstrated in their own career paths, of adapting to the different temporal regime of online news production. Indeed, some even sustained different temporal regimes simultaneously in the case of joint filing of print and online stories in some organizations. The scope for individual agency was further evident in the case of the September 11 terrorist attacks, with the online news producers engaging in ad hoc improvisation of new temporal patterns of work to respond to the perceived need and demand for breaking news.

The differences in the temporal organization of print and online news production do not mean that they were wholly independent of each other. Rather, with online operations generally having emerged out of print operations, and their continuing organizational relationship there were also important connections between the two. Most obviously this related to the work associated with "putting the paper on the web", which was dependent on completion of stories for print production. Other connections, however, were also evident in aspects such as journalists' expectations of the permanence of the record (at least, once archived) and the attempts to preserve the values of the paper (as a particular perspective on the news) online, albeit in abbreviated form. These connections could also operate in the other direction, too, as evident in the expressed notion that print journalists should begin to move away from thinking of the newspaper just as a "deadline-driven, once-a-day edition."

Orlikowski and Yates (2002) propose that their practice-based perspective on temporal structuring bridges the opposition between the objective (clock) and subjective (event) views, seeing them as a duality rather than a dualism. Although people may perceive and experience time as either clock-based or event-based, both are enacted through recurrent practices which may reflect both temporalities simultaneously. This was also evident in the online and print news production processes.

Both print and online news production, for example, involve a clear daily production schedule within a normally well-defined workday, that follows a regular clock-based timetable. Stories typically had timed deadlines, although these were generally short and unsynchronized with online news, compared to the collective, daily event of print journalism. In terms of the product, news was identified by the date and time of its publication, and each successive report was seen as advancing a story, making "news time" strongly directional. This time was also regarded as objective — the news being seen as recording what actually happened at a particular instant. Indeed for certain events, the precise chronology may be set out. Significant aspects of news production and consumption therefore reflect clock-time conceptions of temporality.

Event time was equally important in news production, however. Much news is driven by events, the occurrence of which may be quite unrelated to any particular clock timing. The focus of breaking news is on currency and a major story could disrupt the clock-based schedule of the regular workday. From a slightly longer-term perspective, the routine of news production, however, has a certain cyclical regularity, a daily rhythm building up to a collective deadline. From a yet longer-term perspective, the objectivity of the news reported possibly becomes less reliable, as stories evolve and understandings change, making more apparent the subjectivity of what is presented and regarded as news.

From a temporal structuring perspective, however, clock and event times are not independent. Thus a deadline may be set at a particular clock time, but represents an important event in the daily cycle of print news production. Similarly the regular clock-based schedule of news production occurs in the context of an ongoing flow of events, and news stories may be seen as both objective and subjective representations of time.

The argument of Orlikowski and Yates (2002) may also be extended to embrace Castell's (1996) notion of "timeless time" discussed above. Thus the random discontinuity, arrhythmia and acceleration observed in online news operate in work environments still dominated by working days oriented to particular clock times and shaped by socially-constructed events (some of which may, themselves be arranged to suit, or in some cases confound, the routine, and timed deadlines, of news organizations). Likewise, while the acceleration of the pace of work is, in some senses, objective, with the time taken to publish news stories decreasing from hours to seconds, perceptions of the speed of publication also depend, to some extent on the pace of work to which individual journalists are habituated and entrained (Ancona and Chong 1996). The disruption of sequencing and perceived ephemerality of online news may be similarly a matter of perspective, as journalists (and readers) learn to engage with news in new ways.

### ***The Role of Technology in News Production***

Computer-based information systems are implicated in almost every aspect of online news production, and even if a few activities, such as editorial decision-making may be less reliant on technological support, they take place in a work setting suffused with computer systems of different sorts. This is also the case in much of contemporary print news production. In focusing on the role of ICTs in online news, we are not suggesting that such technologies are not influential elsewhere in the news industry, and in aspects of online news production less evidently dependent on ICTs.

In line with the practice perspective (Orlikowski 2000; Orlikowski and Yates 2002) discussed above, the organizational changes associated with online news are not seen as determined by technology, but rather as realized through the adaptation and creation of practices enacted by producers (and consumers) through their use of ICTs. This does not mean, however, that practices are wholly independent of the particular technologies involved, either. Rather social actors are able to draw on certain affordances of these technologies in the process of change (Hutchby, 2002; Zammuto et al., 2007). A number of these affordances may be seen to be implicated in specific effects on the temporal structuring of online news practices.

In particular, many of the changes associated with online news may be related to material aspects of the Internet. Thus, the capability of readers to access online news sites 24 hours a day would seem a major factor in the creation of new temporal structures in the news industry. For those newspapers offering an online site, for example, responding to this new mode of news consumption would seem to be universally associated with a shift from a once-a-day collective deadline to continuous individual deadlines, regular updating and almost instant publication.

Such changes were not an inevitable product of Internet use per se, however, as a similar pattern is found with news in other media, such as broadcasting. Rather the Internet would seem to have relaxed a constraint on newspapers' delivery of news to their readers, enabling them to compete with other media, whose norms regarding such issues as the length of stories, the efforts expended to achieve accuracy compared to speed, and the priority assigned to analysis and comment compared to being up-to-date, they have largely adopted. The particular ways in which these norms were enacted in specific organizations were not uniform. However, with different emphases reflecting local cultures and competitive strategies.

Another aspect of technology that is not a specific feature of the Internet per se is the availability of searchable newspaper archives. Some of the time-related legal implications of this have been referred to earlier, but such archives also enable considerably faster and more comprehensive searches than would have been possible with print editions. The capability thus provided for comparison of past and current stories, for (re)locating a particular news item, or for retrieving all stories on a particular topic offers the potential for a new mode of news consumption, the

implications of which for journalistic practice would still seem to be being worked through in many organizations, as reflected in differences in the comprehensiveness and accessibility of search facilities on their sites.

Rather than attributing all changes to the Internet in general, moreover, it would seem necessary to be more “specific about the technology” (Monteiro and Hanseth, 1995). For example, certain sites’ use of particular software, such as “single file deploy,” was seen as having helped them to be more responsive. It was not the technologies alone, however, that gained these sites an advantage, since this would not have been achievable without a conceptualisation of the possibilities in the first place and the organizational capabilities to develop and deploy them effectively. Thus, while all online newspapers are, by definition, published on the Internet, their particular distinctive capabilities reflect an ensemble of associated technologies and the practices that developed and continue to sustain them.

## **Implications**

The changing temporal organization of news production and consumption are already affecting work organization in the industry, although few online news practices have yet become institutionalized. Continuing change, in areas such as work content, news production processes, services offered and organizational structures, is still very much in evidence and consistent practices across the industry are rare. A number of general areas of change to online news may be identified, however, from which we may draw some practical and theoretical implications.

### ***Implications for Practice***

In terms of work content, it is clear that online news has been associated with a move towards breaking news, with a consequent acceleration in the pace and immediacy of temporal structuring. All organizations recognized a need for their site to be up-to-date, although they varied in the priority this was assigned. Breaking news was also generally seen as complementing, rather than substituting for, organizations’ existing news services. Thus breaking news on newspaper sites supplemented primary content drawn from the print edition. New temporal structures may therefore emerge out of, and develop alongside established practices, rather than marking a decisive break.

On the other hand, while this complementary role meant that newspaper sites, in particular, included longer stories (though rarely on the front page), original online content (and print material converted to online) tended to be much shorter, supporting a model of news consumption based on quick scanning of many stories. The faster turnaround of online stories also influenced how stories were written, contributing to the emerging ethos of “scrappiness and immediacy”. Thus new temporal regimes are not simply creations of technological necessity or of autonomous management strategy, but reflect, and feed back into, everyday work practices.

The different temporalities associated with print and online news created some significant challenges in integrating the two organizational operations set up to produce them. In a number of news organizations, the recent emergence of online news, its perceived secondary role feeding off print journalism, and the low status of online news employees meant that temporal structures associated with print news remained dominant. Other organizational structures, however, in which online news was accorded greater autonomy enabled temporal regimes associated with online news to achieve greater influence. Power relations may thus be seen as playing out in the temporal organization of work practices, and are fruitful areas for further research.

### ***Implications for Theory***

The findings also suggest some significant implications for theorizing. In particular, they may be seen as illustrating that the temporal structuring approach of Orlikowski and Yates (2002) may be extended in at least two ways. The first of these is that the temporalities that are produced and reproduced through social actors’ practices may be not only those of clock and event time. Rather there may be several temporal regimes that are sustained, in this case including elements seen to be associated with timeless time. The second is an understanding of the particular role that ICTs may play in the emergence of new temporal structures. While this relationship is not deterministic, the affordances entailed in digital technologies more generally, and the Internet specifically, have shaped new temporal practices of news production and consumption, which in turn have shifted the temporal norms and expectations associated with the pace, frequency and content of news production.

While only hinted at by the findings reported here, the relationship between spatiality and temporality is an emerging area of theoretical interest. Specifically, the de-territorialization of news consumption may have important effects on the production of online news. As news sites can be accessed 24 hours a day from anywhere in the world

their audience may be being redefined. Traditional spatial constraints that restricted readership to those able to have hardcopy delivered to them while the news was still fresh are giving way to universal access. At the same time, however, there is also the possibility of some re-territorialization of news consumption as expatriate readers are able to keep as up-to-date with local news as those located “back home”.

Another area of theoretical interest suggested by the findings of this paper pertains to the novel aspects of temporality reflected in Castell’s (1996) concept of “timeless time” and the related notion of “space of flows”. The emerging disconnection of online news from traditional temporal markers such as pace, duration, timetable, deadline, and sequence involves a reconfiguration of how news is understood, covered, and shared. The immediacy, intensity, and impermanence of the “timeless time” embodied in contemporary forms of online news challenge established expectations, meanings, and norms of news production, publication, archiving, and consumption. What the consequences of this entail for the temporality and spatiality of everyday news practices — that is, of journalists, editors, and readers — is an important area of future theorizing.

## Conclusion

In terms of our understanding of IS and organizational change, our online news study highlights three issues: the significance of the temporal dimension of changes in work practices; the continuities across apparently transformational episodes; and the emergent character of the interactions between technology and organizations. Thus, although many elements of the news production process were similar between print and online, the changed temporal patterning meant that the two had very different qualities that fed through into, and were reinforced by, for example, different staff being recruited, different priorities (speed versus accuracy) or different relationships with readers. While this might suggest a fundamental dislocation between print and online news services, the case illustrated that there were significant commonalities. Some of these were practical, such as the online news sites reworking material from the print edition. Others, however, reflected commitments to what were seen to be established values of the “brand”, or to longstanding news industry traditions (online news staff, at least during the period of the research, did not want to cut themselves off from a career in print journalism). In these changes, technologies created potential resources (or obstacles) but the ways in which they were drawn on in particular work practices was subject to local variation and improvisation. Thus, while online news perhaps enabled new temporal structures of newspaper work organization, these were not necessarily entirely novel within the industry (resembling in some part those found in broadcast news), nor were they adopted uniformly across all organizations. Technology could also hinder, as well as facilitate, integration between print and online activities, emphasizing the importance of being specific about both technologies and the settings in which they are used.

As we have sought to illustrate in this paper, the news industry would seem a particularly rich site for the study of changing work practices associated with ICTs, especially in the online news context. The relative neglect of news media as a site for IS research is thus surprising. The current study has only explored one small aspect of these changes and in the context of relatively large, traditional news producers. There would seem significant opportunities for future research in a variety of different contexts, especially with the rapid pace of technological change in the industry. Thus, while blogs, personalized news services, and RSS feeds have attracted some attention from IS researchers, their effects in the news industry, a major site for their adoption, have been relatively unexplored. Similarly, as the capabilities of mobile technologies grow, news services are likely to be a significant area of social change, and thus serve as an opportunity for increased attention from IS researchers.

## References

- Adam, B. 1995. *Timewatch: The Social Analysis of Time*. Cambridge: Polity.
- Ahlers, D. 2006. “News Consumption and the New Electronic Media.” *Harvard International Journal of Press/Politics* (11:1), pp. 29-52.
- Ahlers, D. and Hessen, J. 2005. “Traditional Media in the Digital Age.” *Nieman Reports* (59:3), pp. 65-68.
- Akrich, M. 1992. “The de-scription of technological objects.” In Bijker, W.E. and Law, J. (eds.), *Shaping Technology/Building Society*. Cambridge, MA: MIT Press, 205-224.
- Ancona, D. and Chong, C-L. 1996. “Entrainment: Pace, Cycle, and Rhythm in Organizational Behavior,” *Research in Organizational Behavior*, (18), pp. 251-284.
- Ancona, D.G., Okhuysen, G.A. and Perlow, L.A. 2001. “Taking time to integrate temporal research.” *Academy of Management Review* (26 4), pp. 512-529.

- Barley, S.R. 1988. "On technology, time and social order: technically induced change in the temporal organisation of radiological work." In Dubinskas, F. (ed.), *Making Time: Ethnographies of High-Technology Organizations*. Philadelphia, PA: Temple University Press, pp. 123-169.
- Bluedorn, A.C. 2002. *The Human Organization of Time: Temporal Realities and Experience*. Stanford, CA: Stanford University Press.
- Boczkowski, P. 2004. *Digitizing the News: Innovation in Online Newspapers*. Cambridge, MA: MIT Press.
- Castells, M. 1996. *The Rise of the Network Society*. Oxford, UK: Blackwells.
- Clark, P. 1985. "A review of theories of time and structure for organizational sociology." *Research in Sociology of Organizations* (4), pp. 35-79.
- Clemons, E.K. Gu, B. and Reiner Lang, K. 2002-3. "Newly Vulnerable Markets in an Age of Pure Information Products: An Analysis of Online Music and Online News." *Journal of Management Information Systems* (19:3), pp. 17-41.
- Cusumano, M.A. and Yoffe, D.B. 1998. *Competing on Internet Time*. New York: Free Press.
- Dimitrova, D.V. and Neznanski, M. 2006. "Online Journalism and the War in Cyberspace: A Comparison Between U.S. and International Newspapers," *Journal of Computer-Mediated Communication* (12), pp. 248-263.
- Dubinskas, F. (ed.) 1988. *Making Time: Ethnographies of High-Technology Organizations*. Philadelphia, PA: Temple University Press.
- Eisenhardt, K.M. 1989. "Building theories from case study research." *Academy of Management Review* (14:4), pp. 532-550.
- Fine, C.H. 1998. *Clockspeed: Winning Industry Control in the Age of Temporary Advantages*. Reading, MA: Perseus Books.
- Giddens, A. 1984. *The Constitution of Society*. Cambridge, UK: Polity.
- Glaser, B.G. and Strauss, A.L. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Publishing, Chicago.
- Gleick, J. 1999. *Faster: The Acceleration of Just About Everything*. London: Little Brown.
- Green N. 2002. "On the move: Technology, mobility and the mediation of social time and space." *Information Society* (18), pp. 281-292.
- Hall, E.T. 1983. *The Dance of Life: The Other Dimension of Time*. Garden City, NY: Doubleday.
- Hassard, J. 1989. "Time and Industrial Sociology." In P. Blyton, J. Hassard, S. Hill, and K. Starkey (eds.), *Time, Work and Organization*. London: Routledge: 13-34.
- Holmer-Nadesan, M. 1997. "Essai: Dislocating Instrumental. Organizational Time," *Organization Studies* (18, 3), pp. 481-510.
- Hongladarom. S. 2002. "The Web of Time and the Dilemma of Globalization." *The Information Society* (18: 4), pp. 241-249.
- Hutchby, I. 2001. "Technology, texts and affordances." *Sociology* (35:2), pp. 441-456.
- Jaques, E. 1982. *The Form of Time*. Green Cove Springs, FL: Cason Hall & Co.
- Kavanagh, D and Araujo, L 1995. "Chronigami: Folding and Unfolding Time." *Accounting, Management and Information Technology* (5:2), pp. 103-121.
- Kiss, J. 2005. "Newspapers: An Industry in Crises." [www.journalism.co.uk/news/story1294.shtml](http://www.journalism.co.uk/news/story1294.shtml)
- Lee, H. 1999. "Time and information technology: Monochronicity, polychronicity and temporal symmetry." *European Journal of Information Systems* (8), pp. 16-26.
- Lee, H. 2003. "Your time and my time: A temporal approach to groupware calendar systems." *Information & Management* (40:3), pp. 159-164.
- Lee, H. and Liebenau, J. 1999. "Time in Organizational Studies: Towards a New Research Direction." *Organization Studies* (20:6), pp. 1035-1058.
- Lee, H. and Liebenau, J. 2000. "Temporal effects of information systems on business processes: Focusing on the dimensions of temporality." *Accounting, Management and Information Technologies* (10:3), pp. 157-185.
- Lee, H. and Whitley, E. 2002. "Time and information technology: Three levels of temporal impacts." *The Information Society* (18:4), pp. 235-240.
- Leidner, D. E., and Kayworth, T. 2006. "A Review of Culture in information Systems Research: Toward a Theory of Information Technology Culture Conflict," *MIS Quarterly* (30:2), pp. 357-399.
- Marr, A. 2004. *My Trade: A short history of British journalism*. Basingstoke: Macmillan.
- Maznevski, M.L., and Chudoba, K.M. 2000. "Bridging Space over Time: Global Virtual Team Dynamics and Effectiveness," *Organization Science* (11:5), pp. 473-492.
- McNaughten, P. and Urry, J. 1998. *Contested Natures*. London: Sage.
- Miles, M.B. and Huberman, A.M. 1984. *Qualitative Data Analysis*. Beverley Hills, CA: Sage Publications.

- Mitchell, T.R. and James, L.R. 2001. "Building better theory: Time and the specification of when things happen." *Academy of Management Review* (26:4), pp. 530-547.
- Monteiro E and Hanseth, O. 1996. "Social shaping of information infrastructure: On being specific about the technology." In Orlikowski, W.J., Walsham, G., Jones, M.R. and DeGross, J.I. (eds.), *Technology and Changes in Organizational Work*. London: Chapman and Hall, pp. 325-343.
- Nandhakumar, J and Jones, M.R. 2001. "Accounting for time: Managing time in project-based teamwork." *Accounting, Organizations and Society* (26:3), pp. 193-214.
- O'Leary, M.B., and Cummings, J.N. 2007. "The Spatial, Temporal, and Configurational Characteristics of Geographic Dispersion in Teams," *MIS Quarterly* (31:3), pp. 433-452.
- Orlikowski, W.J. 2000. "Using Technology and Constituting Structures." *Organization Science* (11:4), pp. 404-428.
- Orlikowski, W.J. and Yates, J. 2002. "It's about time: temporal structuring in organizations." *Organization Science* (13:6), pp. 684-700.
- Poor, N.D. 2007. "A Cross-National Study of Computer News Sites: Global News, Local Sites." *The Information Society* (23:2), pp. 73-83.
- Rehn, A. 2002. "Time and management as a morality tale: or 'What's wrong with linear time, damn it?'" In Whipp, R., Adam, B. and Sabelis, I. (eds.), *Making Time: Time and Management in Modern Organizations*. Oxford, UK: Oxford University Press, pp. 77-85.
- Sahay, S. 1997. "Implementation of Information Technology: A Time-Space Perspective," *Organization Studies* (18:2), pp. 229-260.
- Sarker, S. and Sahay, S. 2004. "Implications of space and time for distributed work: An interpretive study of US-Norwegian systems development teams." *European Journal of Information Systems* (13), pp. 3-20.
- Saunders, C. and Ahuja, M. 2006. "Are All Distributed Teams the Same? Differentiating Between Temporary and Ongoing Distributed Teams," *Small Group Research* (37:6), pp. 662-700.
- Saunders, C. and Kim, J. 2007. "Editor's Comments: Perspectives on Time." *MIS Quarterly* (31:4), pp. iii-xi.
- Saunders, C., Van Slyke, C. and Vogel, D. 2004. "My time or yours: Managing time visions in global virtual teams." *Academy of Management Executive* (18:1), pp. 19-31.
- Sawyer, S. and Southwick, R. 2002. "Temporal issues in information and communication technology-enabled organisational change: Evidence from an enterprise systems implementation." *The Information Society* (18:4), pp. 263-280.
- Schatzki, T.R. 2001. "Practice Theory." In Schatzki T.R., Knorr Cetina, K. and von Savigny, E. (eds.) *The Practice Turn in Contemporary Theory*: London: Routledge: pp. 1-14.
- Scott, S.V. and Wagner, E.L. 2003. "Networks, negotiations and new times: the implementation of enterprise resource planning into an academic administration." *Information and Organization* (13:4), pp. 285-313.
- Schriber, J.B. and Gutek, B.A. 1987. "Some time dimensions of work: Measurement of an underlying aspect of organization culture." *Journal of Applied Psychology* (72:4), pp. 642-650.
- Tewksbury, D. 2005. "The Seeds of Audience Fragmentation: Specialization in the Use of Online News Sites." *Journal of Broadcasting & Electronic Media* (49:3), pp. 332-348.
- Whipp, R., Adam, B. and Sabelis, I. (eds.) 2002. *Making Time: Time and Management in Modern Organizations*. Oxford, UK: Oxford University Press.
- Yeh, R.T., Pearlson, K.E. and Kozmetsky, G. 2000. *Zero Time: Providing Instant Customer Value – Every Time, All the Time!* New York: John Wiley & Sons.
- Zammuto, R.F., Griffith, T.L., Majchrzak, A., Dougherty, D.J. and Faraj, S. 2007. "Information Technology and the Changing Fabric of Organization." *Organization Science* (18:5), pp. 749-762.
- Zerubavel, E 1981. *Hidden Rhythms: Schedules and Calendars in Social Life*. Chicago: Chicago University Press.