# Journalistic practice in digital television newsrooms

## The case of Spain's Tele 5 and Antena 3

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A B S T R A C T

This article examines some of the working practices of television journalists and the changes they are adopting in the process of digital news-gathering and editing. It relies on research carried out in the two main Spanish commercial networks, Tele 5 and Antena 3, which implemented integrated digital newrooms in 1998 and 1999, respectively. The study finds that journalists, managers and engineers at both networks developed a collaborative effort in selecting and implementing a digital system which all professionals involved would be comfortable using. It also shows the emergence of new functions and a growing trend towards multiskilling in these television newsrooms.

KEY WORDS   ∎ digital newsroom   ∎ journalistic practices   ∎ multiskilling
∎ technology   ∎ television journalism

## Introduction

When evaluating the role of new technologies in journalism, a cautionary approach should be adopted. The analysis of the changes should not fall into a kind of technological determinism or 'technophilia' (Postman, 1993: 5–7) for the role of technology in journalism should be understood within its social, professional and cultural context (Williams, 1972; Schudson, 1995). Thus, technological changes are introduced within a process of innovation which, as Winston (1998: 6) states, is motivated by a series of 'supervening social necessities'. In this context, MacGregor (1997: 200–1) warns journalists against the risk of being 'seduced by all too easily measured criteria of being first, being live or having something no competitor has', advice which is also valid for researchers, we might add.

Different studies of individual television newsrooms have highlighted various types of procedure, structure, routine, pressure and constraint, as well as the complexities involved in describing journalistic culture (Tuchman, 1978; Schlesinger, 1987; Soloski, 1989). As Gaunt (1990) argues, journalistic practices are largely the result of traditions, economic factors, political constraints, technological developments and the social dynamics of the culture in which they exist.

Much emphasis in terms of recent research has focused on the television news culture at ITN and the BBC (Harrison, 2000; Küng-Shankleman, 2000), on the economics of broadcasting in a fragmented digital environment (Allen, 1998; Chalaby and Segell, 1999) and the transition from analogue to digital television, which opens a realm of possibilities for news services and applications (Thalhimer, 1998; Harper, 1998). Technological developments have often contributed to the establishment of new journalistic practices (Weispfenning, 1993; Pavlik, 1999, 2000), such as the shaping of news-gathering and reporting and, some would say (e.g. Bromley, 1997), even the very nature of journalism itself. Despite resistance by some journalists, the newspaper industry is incorporating new technologies which tend to simplify their work. Marjoribanks (2000) has provided a useful comparative framework with his study of technological innovation at News Ltd workplaces in the United Kingdom, the United States and Australia.

Television newsrooms have been making use of digital component systems for a long time, from wire service computer systems to computerized character generation, from ENG (Electronic News-gathering) to DNG (Digital News-gathering) and non-linear video editing systems (Willis, 1994: 11–38; MacGregor, 1997: 174–201). Since 1995, a fully digital automated system has been available for news broadcasters. The new 'Integrated Television Newsroom', as it has been termed by Powell (1998: 62), enables 'raw material (text-based information, stills, graphics, video and audio clips) to be collected and stored in common servers and accessed by a large number of journalists simultaneously' and it allows for the completion of pieces ready to be broadcast.

Many broadcasters world wide have adopted or are in the process of adopting various types of digital, automatized news systems. In Europe, small news operations such as the Finnish public service broadcasting, YLE, introduced digital technology systems for news on demand as early as March 1996 (Järvinen and Lavonen, 1996), while the 24-hour digital news service at SVT (Swedish Television) was launched in March 1999 (Christensen, 2000). Bigger news broadcasters, such as the BBC and ITN, completed digitization of their newsrooms in the summer of 1998. Cottle (1999: 22–43) has examined the experience of the BBC Newscentre and has shown how digital news

production is socially and culturally shaped by corporate and professional contexts and practices. In the USA, some broadcasters have also adopted digital technology in their newsrooms. By the end of 1999, CNN replaced the analogue equipment in their Atlanta headquarters with a digital server-based system, while the Tribune Company implemented a digital newsroom which integrates its broadcast, print and interactive units (Sullivan, 1999).

In Spain, the commercial network Tele 5 was the first to launch a fully digital news operation in August 1998. The commercial network Antena 3 followed in September 1999. Both networks are among the first large European broadcasters to have completed digitization in all their news operations. As some authors argue, digital production has become a strategic stage in the consolidation of Spanish commercial broadcasters and it involves new journalistic demands (Bandrés et al., 2000: 22–4).

## Research questions and methodology

This article seeks to examine the way in which digital technology was implemented in Tele 5 and Antena 3 television newsrooms. Research questions address the specific changes introduced into newsroom practices, that is, the process of news production, work organization and professional routines. An important issue is whether by using the new system skilfully, journalists are able to gather, process and deliver the news more efficiently. Since 'efficiency' is difficult to measure by objective standards, we have tried to evaluate users' satisfaction with the digital system and their news input. We also look at the role of the internet as a tool for television journalists. Finally, we analyze the extent to which multiskilling (previously separated tasks carried out by the same person) is required in this new setting and if so, the consequences for the workload of journalists and also for their responsibility for the editorial aspects of their news output. We use this term, although we are conscious, as Bromley points out, that multiskilling is a somewhat imprecise concept. He offers the following accurate description of its pitfalls:

> It has been used loosely to describe the dismantling of demarcation between journalists and technicians, writers and camera operators, news gatherers and news processors, and between print, radio and television journalism. It has been categorized as an outcome of the growing convergence of the media, driven by the development of 'new technology' . . . . (Bromley, 1997: 341)[1]

The study relies on research into the digital technology introduced into four Spanish networks: Tele 5, Canal 24 horas TVE, CNN+ and Antena 3. It was conducted from January through June 2000. The object of the study was narrowed down to the Antena 3 and Tele 5 newsrooms, since they were the

only two networks that had completed digitization at that time.[2] During field work at both newsrooms, a series of open-ended interviews were conducted with nine journalists, three news directors and four technical managers.[3]

A closed-end questionnaire was completed by all those journalists who were using the digital technology in each newsroom. The response rate was 67.3 percent at Tele 5 (64 out of 95 journalists) and 51.8 percent at Antena 3 (57 out of 110 journalists). The questionnaire was tested in advance with four journalists at both networks. We asked them for feedback on the face validity and readability of the questionnaire and for any other suggestions they had. Two journalists made comments about the wording of some questions and we decided to rewrite them. Respondents to the questionnaire indicated the degree to which they agreed or disagreed with each of the 20 statements on a three-point scale.[4]

A two-day observation of newsroom practices was also carried out, with the aim of analyzing the whole process of news production. The observational study was therefore intended to supplement, challenge and complement the data acquired from the interviews and the questionnaires.

## The process of implementing digital technology at Tele 5 and Antena 3 newsrooms

Spanish television networks made the digital transition from different internal contexts. When Tele 5 began its technological conversion in 1997, the commercial broadcaster had a small news operation, with limited technical and human resources.[5] Since it had to envisage a considerable investment, it seemed reasonable to go further than other channels. Both Antena 3 and public broadcaster TVE had more human and technical resources dedicated to news. Tele 5 started the transition with the objective of gaining both speed and cost-effectiveness for their news operation.[6] For Tele 5, the goal of going digital met two challenges: upgrading a hopelessly antiquated system and getting ahead of the impending technology by building a state-of-the-art digital facility.

The cost of the whole operation for Antena 3 was 1000 million pesetas (euros 6.25 million). Tele 5 spent 2000 million pesetas (euros 12.5 million); this figure includes the construction of a new building and studios for the news programmes. The investment was initially supposed to increase the newsroom's productivity, that is, the volume of news pieces produced daily by journalists.[7]

Both networks deeply involved their managers, journalists and technicians in the process in order to satisfy the specific needs of their individual news operation. Tele 5's technical manager states:

> As engineers we tend to develop technical structures and then pass it on to users. This time we did it the other way round: we worked with journalists to find out what their needs were and then we looked for a system which would be very easy to use. Journalists spend eight hours a day working on a computer, so they must feel comfortable with that.[8]

At Tele 5, news executives held a series of meetings with technical managers in order to decide upon the system which would be the most suitable for their journalistic demands. As a result of this collaborative effort, engineers understood their news counterparts better and journalists also had to approve the proposals made by the technical directors during the design stage.

Following a similar process, Antena 3's digital newsroom was launched in September 1999.[9] Reporters returning from news-gathering in the field are now able to digitize, log and edit their own material, all from their PCs, without any help from technical staff. Reporters' tracks are also created at the desktop, with the reporters adjusting the audio levels as the computer records the narration. The system allows journalists to instantly shape and modify the news pieces from their computers for they all have access to the incoming source material which is digitally compressed.

Executives from both networks agree that among the biggest challenges they faced was adapting journalists to the new tools and convincing them that the technology was, in fact, going to make their lives easier. To accomplish this, the networks invested in courses to train their newsroom staff in managing the digital system. Journalists met the roll-out of such new systems at Antena 3 and Tele 5 with a good deal of anxiety. At Tele 5, the transition period began in 1997, with the training of journalists in computing skills. The second step was a course on visual grammar and picture editing, which was intended to teach journalists the basic techniques together with some more advanced concepts that would help them to make decisions when they were editing the stories by themselves. Three months prior to launching the digital system in live news broadcasts, from May 1998 onwards, some of the stories were edited on computer-based non-linear systems (although they were finally taped for transmission), so that journalists could get used to the new editing software. At Antena 3, journalistic training was also among the most expensive and most critical elements of its transition to digital.[10] Most of the courses took place in the newsroom, in order to make them more reliable and also to reduce costs.

In the initial weeks after the installation of the system the technical requirements placed on the journalists increased. The amount of time spent on technical matters in order to become acquainted with the system was shortened with training, so as to allow reporters to devote more attention to news content. As one of Tele 5's editors put it:

> With all the extra demands made on us in technical terms, we had to ensure that our journalism did not suffer in the process. The danger is that by concentrating too greatly on the technical side, we lose sight of key content issues. It is very tempting to let technology and the speed with which we can operate get in the way of other issues like accuracy, storytelling and ethical standards.[11]

During its first month of operation, in September 1998, Tele 5's digital newsroom went through several difficult situations. On the very first day, the screen which shows all the items to be broadcast went black, just three minutes before one of the daily news programmes was going on air. Fortunately the producers had a backup copy of all the items on tape so they completed the programme without viewers noticing. Even the news presenter thought everything had gone right.

Antena 3 also confronted several technical problems. The main one arose when the computing network broke down, because of a technical communication failure, which meant that some edited material could not be retrieved from the system and had to be edited again. During the first month using the digital system, all the edited items were duplicated on video tapes as a backup so none of these problems prevented the news programmes from reaching the audience in time. The implementation involved testing all software offline, building in backups, maintaining the analogue technology until the new one was fully working and having technical managers ready to deal with any problems as soon as they arose.

Management at Tele 5 and Antena 3 both said they implemented their changes without shedding any technical staff. At Tele 5, they took the approach of integrating the technical staff into the process of change, re-training those who were strictly video editors and integrating them into a revolving technical team charged with everything from operating cameras to running the control room. According to Tele 5's assistant news director, 'the network's former tape editors have furthered their professional category because now they not only know how to edit straight cuts but they also know how to utilize all of the digital machines'.[12]

The experience at Tele 5 and Antena 3 shows that while designing a digital news system which is both powerful and easy to use is in the province of the manufacturers, implementing the system also involves much thought and preparation by its users, both the journalists and technicians. The whole process took several months before the digital news operation was ready to be

launched and technical problems should be taken into account as part of the transition process.

## Changes in newsroom structure

The implementation of the digital system at both Antena 3 and Tele 5 led to completely new technical facilities in the newsrooms; therefore the physical environment and the working structure changed significantly. One of the news director's requirements was that the technology should be flexible enough to be able to gradually change the newsroom structure, while still maintaining an effective news-gathering operation and a full schedule of bulletins.

Tele 5's central newsroom in Madrid currently has 95 journalists. They are divided into six areas (national, international, sports, economy, culture and society) with 30 editing desktop terminals. They provide enough material to produce six hours of daily news programmes, following the guidelines of the content editors. In addition, 21 producers organize the logistics and external coverage, coordinating the work of camera crews, feeds from international agencies as well as the material received from nine production centres throughout Spain.

Antena 3's news operation relies on 500 professionals nation-wide (with 12 national production centres and seven overseas); all 110 journalists in the central newsroom in Madrid use the digital news system. The newsroom is organized basically in the same way as at Tele 5, with 32 editing desktop terminals and it also includes the new positions of media manager and system manager. According to Antena 3's system manager, they wanted

> to facilitate significant changes in working practices, including training of all journalists in multiskilling techniques. Everyone has had to integrate functions that did not correspond to their jobs before. . . . From a production point of view, we have moved away from the technician–producer split, where the reporter would get all the information but knew little about how to put it together, and the technician [tape editor] would have the skills to make it happen. For complicated work, such as post production graphics, we still have two people.[13]

The digital newsroom enables raw material to be collected and stored in the servers. Feeds coming in via satellite from news agencies or news-gathering trucks in the field can be automatically recorded and instantly viewed anywhere in the newsroom via desktop editing systems. The system also allows the previously unthinkable possibility that more than one journalist can view and log the same images simultaneously. Reporters at Tele 5 and Antena 3 agree that the system makes it easier to find and to exchange information.

Among the advantages of the digital system, journalists point to its capability to change edits very easily. Since it is based on a non-linear editing system, pictures and sounds can be cut, inserted and deleted as easily as a written text in a word processor. This allows for multiple choices of new versions which, in the end, increases production capability. This means that newsrooms could now easily multiply their output.[14]

Two new jobs have been created: system managers and media managers. System managers usually have an engineering background and they take care of the technological aspects of the equipment. They have to solve problems related to the functioning of the servers, computers or connections among them. Media managers take charge of the traffic of information inside the newsroom: they assign 'profile lines' (access to the main server) to every reporter in order to edit the news items; and they decide about priorities in the allocation of resources. In addition, they are advanced users of the system, since they have received a more comprehensive training and they are able to diagnose any possible failures.

Some responsibility about content decisions, although nominally resting with the editor who makes the programme, has been transferred in practice to the media manager. Four media managers usually work on the traffic desk on each shift, assigning the necessary system resources to the users. Once reporters have edited their stories, they are sent back to the server, from where they can go straight on air. A selection of the material will remain in the server for five days. Afterwards, it is available in a digital library.

News managers pay particular attention to work flows, because this ultimately drives the news operation. At Antena 3 and Tele 5, news editors believe that the news should be both event and time-line driven. The newsroom has been turned into the place where the creative processes governing text, media and presentation all come together in a single seamless environment. One of Antena 3's reporters said:

> We do not attempt to use digital technology to work *in the ways we've always done it*. Instead, we have opportunities to improve the production processes. For example, we can now update and change pieces while the programme is on air, with much more flexibility than with the previous system.[15]

The internet has become an integrated research tool for news professionals. The new system provided each journalist with access to the internet and, as a result, they have been using it daily, according to their own requirements.[16] On the one hand, they often turn to web pages when they have to report on a breaking story to find experts' reactions and also to include web graphics in their pieces. On the other, they mention that the accuracy of web sources is sometimes difficult to check and rights have to be cleared in order to broadcast some material.

Archiving no longer needs to be separated from all other processes in the news production cycle and the decision of what goes into the archive is becoming part of media management.[17] The new digital library allows journalists to browse the key frames of a piece, and to search for key words, with instant access. The digital system allows journalists to get closer to the material and to have greater control over the decision-making in editing each piece.

## How journalists view their work

Although the final stage seems to please most journalists, the process of conversion was hard for most journalists and technicians. As previously mentioned, a questionnaire was applied to journalists in both newsrooms. The results are shown in Table 1.

In the initial weeks after the installation of the digital system, there was some evidence that technical standards on the programmes worsened. In particular, many more bad edits made it through to air. As time went on, however, technical standards improved. Most journalists (61.2 percent) state that the technical quality of the video material has improved with the digital system, although 50 percent of Tele 5's journalists do not agree with this claim. Some of them mentioned the fact that recording is still done with analogue cameras, so that digitization does not improve the technical requirements for the images.[18]

To a certain extent, audio-editing seems to be one of the weaknesses of the system: 62.8 percent of respondents stated that the new system had not helped to improve audio quality. Apparently the software has yet to be perfected in order to allow a higher audio quality in the edited stories. Antena 3's system manager believes that editing quality has improved, since journalists now have more time to edit, as they do not have to share the editing suites.[19] However, he also argues that sometimes natural sound is not edited as well as it was before.

The new system makes it possible to finish stories closer to air time, since it allows changes to be introduced more easily. In each digital newsroom, the number of editing terminals has at least doubled; and journalists no longer have to rely on just a few editing booths, where 'bottle-necks' occurred shortly before broadcast time. Users' perceptions confirm this point, since 78.5 percent of respondents consider that the editing process is now faster. One reporter at Antena 3 argued that by working on video and text on the same computer she had more time available: 'With the analogue system, you wasted more time waiting for your item to be edited in the booths. Now you can organize your time according to your own deadline'.[20]

However, according to the programme editors, the whole process from input to air for each story takes approximately the same time it took with the analogue system. Editors mentioned two reasons which would explain this: journalists now dedicate more time to polishing the final cut and sometimes they have to wait until incoming tape material is digitized.

As far as editorial quality of the stories is concerned, some journalists made the point that they have less time available and cannot be properly dedicated to finding good stories and writing them efficiently, as they were before. Since reporters now spend more time editing their own pieces, working with the visual material and using their computers more often, presumably they have less time available for gathering background information, planning and producing their stories. Some reporters admitted they are expected to

**Table 1**    How Tele 5 and Antena 3 journalists view their work

| Question | | Tele 5 | Antena 3 | Total (% respondents) |
|---|---|---|---|---|
| 1. Video quality has improved | Yes, I agree | 4 | 24 | 28 (23.2%) |
| | I partially agree | 28 | 18 | 46 (38%) |
| | I do not agree | 32 | 15 | 47 (38.8%) |
| 2. Audio quality has improved | Yes, I agree | 0 | 15 | 15 (12.4%) |
| | I partially agree | 18 | 12 | 30 (24.8%) |
| | I do not agree | 46 | 30 | 76 (62.8%) |
| 3. The editing process is faster | Yes, I agree | 30 | 21 | 51 (42.1%) |
| | I partially agree | 20 | 24 | 44 (36.3%) |
| | I do not agree | 14 | 12 | 26 (21.5%) |
| 4. Journalists have less time to find, write and contrast information | Yes, I agree | 25 | 30 | 55 (45.5%) |
| | I partially agree | 25 | 21 | 46 (38.0%) |
| | I do not agree | 14 | 6 | 20 (16.5%) |
| 5. Multiskilled journalists produce worse stories from the editorial point of view | Yes, I agree | 18 | 18 | 36 (29.8%) |
| | I partially agree | 20 | 15 | 35 (28.9%) |
| | I do not agree | 26 | 24 | 50 (41.3%) |
| 6. There is more supervision by news editors | Yes, I agree | 22 | 15 | 37 (30.6%) |
| | I partially agree | 22 | 33 | 55 (45.5%) |
| | I do not agree | 20 | 9 | 29 (23.9%) |
| 7. News programmes have changed significantly | Yes, I agree | 6 | 8 | 14 (11.6%) |
| | I partially agree | 11 | 21 | 32 (26.4%) |
| | I do not agree | 47 | 28 | 75 (62%) |
| 8. Internet has become an indispensable tool | Yes, I agree | 38 | 27 | 65 (53.7%) |
| | I partially agree | 26 | 27 | 53 (43.8%) |
| | I do not agree | 0 | 3 | 3 (2.5%) |
| 9. Expectations of the digital system are not yet fulfilled | Yes, I agree | 32 | 42 | 74 (61.2%) |
| | I partially agree | 26 | 15 | 41 (33.8%) |
| | I do not agree | 6 | 0 | 6 (5.0%) |

Total respondents: 121. Breakdown: Tele 5: 64 (out of 95), Antena 3: 57 (out of 110)

produce stories that, because of insufficient time or resources, fail to meet professional standards, including such basics as double-sourcing key facts. The questionnaire reveals that 83.5 percent of respondents consider that journalists now have less time to find, write and contrast information.

As mentioned before, the integrated digital newsroom works on the basis of a new role for journalists, who must now edit the pictures on their personal computers. Traditionally, in most Spanish television newsrooms, journalists were mainly concerned with editorial content: they had to gather background information, interview sources, write the text and read the 'voice over'. Technicians took care of editing the video. Nevertheless there were a few attempts to establish multiskilling, with different degrees of success.[21]

Initially, multiskilling seemed a difficult challenge for most professionals. According to one of the reporters at Tele 5, at first 'a few journalists thought they would even have to look for a new job, since they had to face a totally new system and they would have to edit, which very few had done before'.[22] But after a month working in the new system, the majority of them adapted well. Reporters are now much more involved in shoots out in the field because they know they will have to edit the video later. Since pictures are one of the aspects that reporters must worry about, they tend to make sure that they have enough interesting visual material to elaborate stories. Tele 5's manager of technical directors argues that journalists are now more interested in picture editing, since they know more about visual grammar.[23] In addition, the fact that one person writes the text and edits the pictures allows for a better combination of pictures and words.

A majority of respondents (58.7 percent) think multiskilled journalists produce worse stories from the editorial point of view. However, a large percentage, the remaining 41.3 percent, believe this is not the case. Professionals increasingly consider multiskilling as a requisite in their work.

The role of the internet as a source for news-gathering is quite significant. In the previous situation, back in 1998, only about 10 percent of journalists in each newsroom had access to the web. Now, web access is available to all reporters and 96.5 percent of respondents regard the internet as an 'indispensable tool' in their work.

Another issue in an integrated digital newsroom is editorial control. The system is designed to allow management to control the content easily, since programme editors have immediate access to the pieces being elaborated by each journalist. This is substantiated by the survey: 30.6 percent of respondents think there is now more supervision; and 45.5 percent partially support this view. Their view confirms the fact that the system allows editors to access reporters' pieces while they are still being produced in their editing terminals. All three news directors interviewed confirmed that they can now access every

script and video once it is in the system ready to be broadcast and that they can suggest last minute corrections or improvements. Editors also point out that some of the items are finished just before going on air, which means that sometimes they are unable to supervise them.[24]

In spite of these changes in journalistic practice, the news professionals' perception is that little has changed in the actual content of the news programmes which are currently being produced, compared to the ones made before the implementation of digital technology. Only 11.6 percent of the journalists at Antena 3 and Tele 5 consider that there has been a significant change in programme content. News directors interviewed at both networks emphasized that with the introduction of the system there was no accompanying decision to change either programme content or programme design.

Finally, most journalists consider that the so called 'digital revolution' is still an unfulfilled promise: 95 percent of interviewees believe the expectations created by digital technology have not yet been met.

Some questions arise about the role of journalists and their insertion into the television industry. A controversial one is whether journalists in the new system become small pieces of machinery where their role is significantly limited, with very little space left for creativity and personal output. Some news professionals claim that newsrooms are losing their traditional atmosphere where newcomers used to learn from veterans and they all shared information, contacts and approaches to news stories. They argue that computer-based work turns journalism into quite a different job which is fulfilled much more individually, and it reduces the chances to exchange information among one another. Digital news production seems to require less collaborative effort than with the analogue system.

## Conclusion

This research shows how the implementation of integrated digital newsrooms in the two main commercial Spanish networks, Tele 5 and Antena 3, has helped increase the collaborative effort between journalists, managers and engineers, so that all involved parties can work together. The advent of software-based solutions and digital servers has allowed news managers to define what is actually required. The main challenge for journalists, with the help of the technical staff and the system providers, was to work out what they wanted to achieve and then the way in which they wanted to change.

A gradual training process was essential, headed by a team of journalists and technical staff from the news operation. The investment in training newsroom people in advance contributed to the smooth transition from tape-

based systems to digital servers. It was important for project managers to work closely with users from all disciplines: reporters, archivists, directors, engineers, etc. Introducing the new system gradually, and with analogue backup, simplified the transition.

Although the system allows the production process to be completed faster and with fewer people, in fact both networks decided to maintain the number of staff. One of the broadcasters' requirements was that the system should be flexible enough to be able to gradually adapt to new workflow patterns. Two work roles have been incorporated: system managers, who supervise the technological functioning; and media managers, who take charge of the traffic of information inside the newsroom and decide about priorities.

These news operations are placing the whole editing process in the hands of the individual journalist, with just the final supervision of the news programme editor. As a result, the new system has enabled journalists to take direct control over the process of producing a complete news package and increasing their responsibility. Reporters now edit the pictures and sounds from their personal computers and they increasingly tend to develop more visual storytelling skills. Journalists say that they enjoy the increased speed and flexibility in the process. Nevertheless, the digital system also allows news editors to supervise and modify all the pieces which are on the server before they are broadcast. Therefore, it seems overall editorial control has been strengthened.

In both networks, multiskilling is a growing trend to which journalists are adapting. The automation of the system tends to increase the work load of each person in the newsroom. Reporters have had to learn new skills, such as technical understanding of broadcast sound quality and picture editing. Multiskilling often means a greater amount of work assigned to each journalist, who is expected to gather the facts, assemble the content, write the script, edit the pictures and sound, and record his or her own narration.

The work of reporters is undergoing some specific changes which are facilitated by the new technical and journalistic developments: editorial decisions on the production of pieces can be taken even closer to air time; the gradual integration of archive management into the production process tends to supply large amounts of visual material which can be used more easily in the stories by reporters; and journalists tend to be more concerned about including 'good' visuals in their own pieces.

To a certain extent, journalists now tend to fulfil their job more individually. Some reporters, once they gain experience of the demands and pressures of journalistic culture, appear to find it more difficult to exchange information with other newsroom colleagues. Computer-based work tends to be more individualistic and, therefore, less team work is required. Journalists

also increasingly devote more time to technical issues. Nevertheless, within the scope of this study, it is difficult to assess the extent to which significant changes in newsroom culture have already taken place in these Spanish newsrooms, in terms of consistent practices, normative judgements and explicit values. This could be a valuable line of enquiry for further research.

Both Tele 5's and Antena 3's experiences show that when implementing a new system in broadcast newsrooms, paying close attention to the human factors is absolutely essential. There are further areas that could be addressed in subsequent work, particularly in regard to content issues (output) and also the business implications, that is, the economics involved in developing a cost-effective digital news operation.

### Acknowledgements

### Notes

1   For another insightful analysis of multiskilling in television news see also MacGregor, 1997: 202–16.

2   Antena 3 and Tele 5 network news operations completed the digitization of their production process. Tele 5 incorporated digital technology over an 8-month period, beginning at the start of 1998. Antena 3 launched its digital news broadcasts in September 1999. Others, including CNN+ and the larger TVE national news operation, are in the midst of the transition process. In 1997, TVE launched Canal 24 horas, the country's first channel to broadcast news 24 hours a day. While the channel broadcasts to audiences world wide, in Spain it is part of the news offered by the digital platform Vía Digital. In January 1999, the rival digital platform Canal Satélite Digital teamed up with Ted Turner's Cable News Network to launch CNN+, Spain's second all-news channel.

3   As far as our analytical approach in the interviews is concerned, we looked for agreements and disagreements with our research questions, as well as illuminating examples, background information, controversies in thinking and professionals' reactions.

4   We did not ask respondents to indicate demographic items. Nine out of the 20 responses were considered significant and they are reported in Table 1 (see 'How journalists view their work'). The remaining responses were either too obvious or not relevant to our research questions.

5   In 1997, Tele 5's newsroom employed 65 journalists and 29 technicians. They produced three 45-minute daily news programmes. At that time, Antena 3's newsroom had over 100 journalists and 73 technicians. They produced a similar news output.

6  The system implemented at Tele 5 is based on a Profile video server developed by Tektronix, and an Omnibus system of automation. Journalists and editors can retrieve pictures and edit them on their personal computer terminals.

7  Tele 5's news director stated that the digital system has allowed them to produce about 45 extra minutes of news which are included in their broadcasts or sold to other stations (Luis Fernández, Tele 5's news director, personal interview, 21 June 2000).

8  Jose Luis Romero, Tele 5's technical manager, personal interview, 20 June 2000.

9  The system is based on a Profile Tektronix server and an Omnibus automation system, which is very similar to the one at Tele 5. According to Antena 3's system manager, the Tektronix–Omnibus option was chosen because its modular architecture was able to support more terminals than any other system. To a certain extent, they relied on Tele 5's experience (Jesús Martínez, Antena 3's system manager, personal interview, 27 March 2000).

10  Jesús Martínez, Antena 3's system manager, personal interview, 27 March 2000.

11  Vicente Vallés, Tele 5's assistant news director, personal interview, 21 June 2000.

12  Vicente Vallés, Tele 5's assistant news director, personal interview, 21 June 2000.

13  Ernesto Sáenz de Buruaga, Antena 3's news manager, personal interview, 27 March 2000.

14  Shortly after implementing their digital television newsrooms, both networks launched their news websites, www.informativost5.com and www.a3n.tv, in March 1999 and September 1999, respectively. They are currently considering the launch of a 24 hour broadcast news operation (Luis Fernández, Tele 5's news director, personal interview, 21 June 2000; Ernesto Sáenz de Buruaga, Antena 3's news manager, personal interview, 27 March 2000).

15  Jesús Fernández, Antena 3's reporter, personal interview, 27 March 2000.

16  Interviews with journalists at Tele 5 and Antena 3, 21 June 2000 and 27 March 2000.

17  At both networks, the storage of all digital data is implemented by a Virage Video Logger System.

18  Personal interviews with journalists at Tele 5, 21 June 2000.

19  Jesús Martínez, Antena 3's system manager, personal interview, 27 March 2000.

20  Nekane Goñi, area coordinator at Antena 3, personal interview, 28 March 2000.

21  When Antena 3 began to broadcast, in 1990, a group of journalists were trained to do, in addition to the traditional functions, camera work and picture editing; and most of the journalists did, at least, the editing work. In 1998, when the current news management was implemented, multiskilled ENG journalists were relegated, although some journalists retained the editing. This situation helped in the transition to the new integrated newsroom, since for some of them it was mainly a matter of using a new tool to edit, rather than learning a new function. The situation at Tele 5 was quite different since most journalists had never done either camera work or editing before.

22  José Luis Fuentecilla, Tele 5's reporter, personal interview, 21 June 2000.

23  Manuel Rodríguez, Tele 5's manager of technical directors, personal interview, 20 June 2000.

24   Luis Fernández, Tele 5's news director; Vicente Vallés, Tele 5's assistant news director, personal interviews, 21 June 2000 and Ernesto Sáenz de Buruaga, Antena 3's news manager, personal interview, 27 March 2000.

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