6 Multi-skilling as a Solution?
Changing Workflow and Journalistic Practice and the Implications for International News

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INTRODUCTION

Digital technologies and the digitization of editorial production processes have had, or threaten to have, profound effects on journalists and their signature output, news (Lambert 2007, 61). Digitization has progressively brought together what were previously in analog environments discrete steps in sourcing, constructing, disseminating and receiving journalism. In fully digitized form these now occur seamlessly (Australian Broadcasting Corporation 1999, 4). Digitization has allowed newsrooms to be "integrated" (Powell 1998, 62). Yet integration "is about more than bringing digital media into the main newsroom. The very nature of the newsroom has changed. . . . It's about creating a single hub for all editorial decisions, and a single workflow for all stories" (Kirby 2007). Starting with the computerized input of "copy" by reporters in newspapers in the 1970s (Frost 2003, 29), the level of integration has escalated from intra- to inter- and even extra-media, bringing together across multiplying platforms text, sound and vision; print, broadcasting and online; and producers and users. Two diametrically opposed broad responses to these developments have emerged (Curran 2010). Optimists believe that these new conditions are "exciting, and rich with possibility" (McNair 2009, 349). Pessimists fear that international news in particular will be made superficial, sensational, less "professional", loosely quality controlled and more narrowly focused on the so-called developed world (Berger 2009; Manning 2008, 253; Matheson and Allan 2009, 57, 71). In television especially, studies have found that digitization shapes the news production process (Chen 2003; Lin and Davidson 2007; Yen 2005). However, empirical studies are needed to untangle the complicated interactions between changing news technologies and journalistic practices (Cottle and Ashton 1999, 26) to provide data with which to then assess the likely impact on the flows and counter flows of international news.

This chapter reports on a transnational study of the introduction of integrated newsrooms in two multi-channel television stations situated in significantly different wider media contexts. In both instances, the multi-

skilling of news workers associated with digitization impacted least on the coverage of news. Indeed, reporters' roles were largely quarantined from the most evident effects of any "digital revolution". This begs questions about the strength of the empirical evidence supporting arguments that digitization by itself has negative implications for news.

DIGITIZATION OF TELEVISION NEWS

The digital newsroom has been adopted in more and more TV stations worldwide. The digital news process has four components: digital news coverage (reporting, writing and shooting); non-linear editing; digital broadcasting; and database storage (Chou and Ju 2005, 53–4; Lin and Davidson 2007). It breaks the linear, sequential constraints of the old analog equipment, and the production process becomes reciprocal, circular and multi-directional. Integrated newsroom technology allows simultaneous sharing of digitized footage and archives, convenient modifications of digital content, swift response to last-minute changes (Abunu et al. 2003) and flexible re-purposing of news for multi-platform distribution.

Implementing digital TV newsrooms requires adjustments in workflow and work roles as a result of the alterations of technological infrastructures, organizational structures and management (Chang 2004; Chou and Ju 2005; Ke 2006). For journalists, this requires a variety of levels of adjustment. The text process is not changed a great deal after digitization. Reporters' input methods remain the same in most aspects. They still use their desktop computers to key in story leads and scripts, and producers and editors revise them and arrange rundowns in the same text/rundown systems they used under the old regime. However, all content is ingested into a server-driven digital system. The ingested content may be viewed and edited by many different people at the same time. Edited news is saved in the central server. When the news is broadcast, content is retrieved for airing at the right point. Through the broadcasting server, the studio production team combines anchor shots, news clips, computer graphics and special effects/animation, and it transmits signals to receivers. Later, the digital content can be modified, duplicated and transmitted over multiple platforms (e.g., Web, mobile phones) synchronously or asynchronously. Finally, the archival asset management database is used to systematically catalog and manage the content for re-purposing and future re-use.

The database is considered to be the core of the digital, non-linear TV news production process (Usher 2003). It allows journalists and news crews to easily access updated or archival audiovisual content, which makes content creation and modification more efficient. Overall, using digital newsroom technology increases flexibility and convenience for sharing resources, exchanging information, interacting and responding promptly to changes (Abunu et al. 2003). Although the digital transformation has little influence

on news generation and news judgment (Chou and Ju 2005), it requires a new workflow and work adjustments to manage content creation, data storage and transmission (Chang 2004; Chen 2003; Chou and Ju 2005; Yen 2005), directly impacting the ways in which journalists operate.

CHANGES IN JOURNALISTIC PRACTICES: MULTI-SKILLING

As Deuze (2008, 11) points out, the implementation of digital newsroom technology leads to an increasing emphasis on multi-skilling, which has become the requirement of broadcast journalists in the digital age (Avilés and Leon 2002, 365). Some approve of multi-skilling as a means to save manpower and costs, and others regard it as a positive force in increasing flexibility in content transmission and in accelerating information access and data retrieval (Saltzis and Dickinson 2008, 224), as well as increasing control over news output (Cottle and Ashton 1999, 26). However, there have been many criticisms that digital computerized technologies fragment work and de-skill workers (Cottle and Ashton, 1999; Saltzis and Dickinson, 2008). This has led to debates over the nature of multi-skilling. Bromley (1997) and Ursell (2001, 176) raised the concern that multi-skilling was blurring the distinction between journalists and technicians. MacGregor (1997) described the computer-bound journalist as no more than a mouse monkey who sacrificed journalistic performance for haste to reproduce news into various packages for various programs or outlets. In the same way, Deuze (2008, 11) found journalists were forced to re-tool and diversify their existing journalistic skills to produce more pieces for multi-platform distribution within the same amount of time. Where journalists are not trained in video shooting or editing techniques, the added requirements of multi-skilling might blunt their primary journalistic practices: news idea generation, news writing and news coverage (Ursell 2001, 193) and reduce the time available to fulfill traditional journalistic roles (Avilés et al. 2004) forcing compromises in news content, such as distortions of news values and superficial news treatment. Indeed, it has been suggested that the net effect is one of de-skilling as journalists are forced to overwork (Cottle and Ashton 1999). As such, multi-skilling might lead to increasingly pressurized news production arrangements, journalists' higher stress levels and burnout rates and an ongoing re-casting of specialists into generalist reporters (Deuze 2008, 11).

Indeed, the requirements of multi-skilling often meet strong initial opposition from journalists and other news workers (Deuze 2008, 8; Deuze and Bardoel 2001). In the BBC's newsroom, Cottle and Ashton (1999, 34) found that although implementing digital newsroom technology resulted in successful multi-skilling and multi-media production, it increased journalists' workload and provoked their resentment. Similar outcomes happened in Spain's Tele 5 and Antenna 3, where the introduction of convergent

newsroom technology caused initial resistance and apprehension among journalists (Avilés and Leon 2002, 365). Journalists whose skills were not related to the technical side tended to resist the multi-skilling practices more than others (Avilés et al. 2004, 96). Some journalists felt that these technological changes and multi-skilling simply translated into more work without providing added returns. However, most TV journalists, after training and adjustments, embraced multi-skilling and overcame the challenges of using new production tools, like non-linear editing (ibid., 95).

METHODOLOGY

The adoption of digital technologies by an increasing number of TV stations across the globe provided an impetus to investigate its effects on journalistic practices, especially multi-skilling, in a comparative study of the implementation of integrated systems in one multi-channel TV station in Singapore and Taiwan, two wealthy Chinese-dominated territories well known for their early adoption of advanced technology. The research was based on a case study approach to garner qualitative data through semi-structured interviews with digital newsroom project managers and news supervisors, as well as conversational interviews with news workers (reporters, editors, producers, assistant directors, etc.) and overt observation of news production processes, news work and newsroom dynamics.

Blumler, McLeod and Rosengren (1992) called for more comparative media systems research, but difficulties lie in several areas: the need for a deep understanding of the media being examined, the need for rigorous methods that make meaningful equivalences and the need for recognition of the multiplicity and diversity in cultures and contexts. These concerns were addressed in part through the author's previous experience as a TV reporter and a producer in Taiwan, as well as his familiarity with digital news production in the selected cases. Although the two stations were studied at different times, each was going through the same stages of digital transformation when examined. Each had turned to the integrated newsroom to improve multi-language news production and replace obsolete analog equipment.

Selecting representative cases is crucial in conducting case studies (Stake 2005). The two stations investigated, MediaCorp News in Singapore and Eastern TV (ETTV) News in Taiwan, are national multi-channel broadcasters of multi-language newscasts. They differ in their technological setups and implementation of digital newsrooms, digital workflow and news practices, organizational characteristics (organizational structure, organizational culture) and political and economical milieus. Taiwan, which has a population of twenty-three million, is a highly politicized and polarized democracy with freedom of the press, whereas Singapore, with a population of only 5.08 million, is a one-party state whose media are commercial

but under government control. Taiwan's highly competitive commercial TV news ecology has eight 24/7 news channels and another seven stations broadcasting primetime TV news.

The qualitative data were mined to search for recurrent patterns, identified codes (e.g., news production processes, steps in the workflow, multi-skilling and user responses) and categorized relevant content under the codes. Later, the data were compared under the selected codes to discern similarities and variations. The observational results were used to triangulate interview data to minimize possible distortions caused by organizational politics to ensure the reliability of the comparisons. A study of the processes and impacts of digital TV newsrooms in Singapore's and Taiwan's multi-channel TV stations provided an opportunity to compare and contrast similarities and differences related to the implementation of digital technology and TV news practices taking into account (inter)national contexts.

THE TELEVISION STATIONS

Singapore and Taiwan were ranked fifth and seventh globally in the 2007 International Telecommunication Union Digital Opportunity Index. However, they have distinctive TV news industries and media cultures. Singapore has a single major government-controlled broadcaster, MediaCorp, whereas Taiwan is characterized by a highly competitive news environment. Due to the cut-throat market competition, Taiwan's commercialized news stations are more concerned with ratings than the near-monopoly, government-owned MediaCorp. Taiwan's TV news programs tend toward sensationalism, whereas Singapore's TV news is strictly regulated and avoids or carefully handles sensitive and controversial issues related to politics, race, religion and so on. Moreover, Taiwan's TV journalists or news workers can easily switch jobs to other TV stations with similar or different political ideologies or organizational policies, whereas their counterparts in Singapore can realistically work for only the one station. These conditions affected the adoption of digital news technologies.

In Singapore, CNBC Asia's news branch was the first to establish a digital newsroom with an Avid system and started the transition to a tapeless operation in August 2005. Two years later, MediaCorp adopted the Thomson Aurora system in order to improve its multi-language news production and replace its obsolete videotape recorders. The reasons given for MediaCorp News' choice of the Thomson system included its compatibility with the existing ENPS text system, its user-friendly interface and design and its reasonable cost. After an earlier attempt at media diversification, MediaCorp returned to its near-monopoly status in January 2005. MediaCorp TV operates seven television and thirteen radio channels, as well as some periodicals, print media and a film business. To serve Singapore's multicultural society and South East Asian audiences,

MediaCorp (TV) News produces primetime newscasts in four languages (English, Chinese, Malay and Tamil) and one 24/7 news channel, Channel News Asia (CNA) in English. Established in March 1999, CNA has more than forty news workers who cover major Asian and key cities in the west. In total, MediaCorp's news department has 450 employees, including 200 journalists, 40 camerapersons, 18 video editors and 150 production crew members.

In Taiwan, digital newsroom technology was viewed as the strategic tool for success in the ferocious competitive environment, and Taiwan's TV news stations started to set up integrated newsrooms relatively early, in 2003, but the prohibitive costs meant that by 2008 only five out of the thirteen TV news stations had made the transition to digital news systems. The majority, including ETTV, chose the same proprietary system, the Avid News Gathering System (ANGS), which has been widely adopted around the world. ETTV, part of Eastern Broadcasting Corporation (EBC), produces newscasts in Mandarin and other Chinese dialects on multiple channels. EBC is a media conglomerate that owns multiple cable systems, seven TV channels, a newspaper, a radio station and an online news forum. The ETTV channels, one of the biggest private Chinese-language TV operations in the world, can be watched in sixty-six countries. Its 24/7 news channel was established in 1991 and was named ETTV News in 1997. EBC's ex-president set a visionary goal for the ETTV news channel to become the Chinese CNN and initiated the transition to digital to supply news simultaneously to six Chinese and dialect channels. By January 2004, it was broadcasting 100 percent of its newscasts by ANGS. Late in the same year, ETTV became the first station in Taiwan to set up a digital tape library database and transform all audiovisual data from tapes to digital files.

ETTV News was just completing its digital migration when the interviews and observation were conducted in 2006. During this data collection period, the 800 news crew members in ETTV News produced news for minority and overseas broadcasting, like Hakka News, Aborigine News, American News and Asian News. Most of ETTV TV's channels are in Mandarin, but Hakka News and Aborigine News are in Hakka dialect and native tribal languages. Practicing news convergence across multimedia platforms, the ETTV News assignment desk served as a hub for providing audiovisual materials to TV news channels, radio news, online news and a newspaper. After ETTV reporters and video journalists covered news, they brought back information and audiovisual content to the headquarters for colleagues to repurpose as content for their media. ETTV News reporters mainly produced news in Mandarin Chinese, and writers or producers in other TV channels slightly altered these news scripts for narrators to re-record voiceovers in other Chinese dialects and other languages. Each TV channel had its own line producers to select stories and arrange rundowns for the targeted audience.

FINDINGS

MediaCorp News

The challenge for MediaCorp News was to create a common platform for four sets of news workers with different practices and working cultures. The senior editor of Chinese News & Current Affairs said, "We are working on a common platform and there are four groups of us, four different languages. I think this is a challenge for us. . . . I don't see many stations having this kind of characteristic. So this is very unique and this uniqueness has translated into a challenge".[1] Implementation occurred gradually, starting from CNA and moving through English news, Malay news, Tamil news and Chinese news. "Because we cannot do a big-bang rollout, it's very difficult, so we are doing it bit by bit", said the director of Production Resources, who led the digital newsroom transformation project.[2] According to the senior manager of Broadcast Engineering,[3] there was not much technological customization but more adjustment in work and workflow. Another tough mission was to draw up an optimized digital workflow for tapeless news production. MediaCorp's new workflow had seven steps: filming, ingestion, browsing, low-resolution (LR) edit, high-resolution (HR) edit, playout and archive.

The digital newsroom allowed news workers to share ingested content and resources among CNA and the four language news departments. The executive editor of the English news output said, "So with digital, as soon as the pictures are available and I put [them] in the server, Chinese, Malay, Tamil, English news all can go in at the same time, all can edit at the same time, and they can all put the pictures [in] as fast as they can. They don't have to wait now for the tape . . . ".[4]

In the browse step, ingested footage or digital archive can be searched and watched simultaneously by multiple users (reporters, editors and producers). The news reporters can watch footage to write better quality scripts, whereas news supervisors and producers are able to watch news clips to vet news stories or arrange rundowns. According to CNA's senior producer,[5] the added functionality of viewing videos helped reporters to write to the pictures and assisted editors and producers to arrange rundowns more appropriately and do better quality checks. The executive editor of English news output described the previous method of vetting without watching videos as a blind process and thought the browsing function had improved the editorial process: "Now with digital, all the PCs, we'll get to look at the visuals, so when I have the reporter's scripts, even before I vet the script, I can already view the pictures. . . . The quality checks will be better before we go on air".[6]

CNA's senior producer was clear that the digital system improved the quality and efficiency of consultation and collaboration among news workers: "I think that the editorial decision-making on the content of stories for workflow [has] also become smoother because the consultation between a

writer and their editor becomes a more smooth operating thing, because they can both be studying a particular interview even if they're in separate parts of the newsroom, they can both be looking at it at the same time. They can be reaching a judgment far more simply and far more immediately".[7]

In the LR edit stage, local news reporters and language producers select ingested shots and do low-resolution editing or voicing on their desktop computers. The three reporters from local English output and the two Chinese producers who were interviewed embraced the challenge of editing their news clips because they were tired of tape problems and long queues for editing and they liked to have more ownership and autonomy in news creation. Although they mentioned minor work-station and software problems, overall they were quite positive about the new workflow. Later, in the HR edit, the craft editors use work-stations to fix reporters' draft editing, adding special effects by editing in high-resolution materials from production servers. Any concern on the part of craft editors that they would be replaced by reporters was unfounded, according to the English news editor, Rosmawati Sulaiman: "We still need the video editors. . . . For longer packages, for more complicated packages, we will still need them to edit . . . because video editors are still better than us in terms of the picture quality. . . . We can cut straight stories, interview pictures. . . . But if you want us to do colorful stories, like putting in music and colors, very complicated, we still need the video editors".[8]

As for playout, all finished news clips were stored in the central server waiting for the playout servers to retrieve them in the order they had been put in the rundowns. Server-based broadcasting reduced the chaos of sending newly finished tapes to the studios and eliminated the possibility of playing the wrong tapes. Playback operators no longer had to arrange and switch tapes based on rundowns and simply clicked news files to put them to air, although the line producers had to keep track of the readiness of news clips and retrieve the right files for rundowns. According to the senior manager of the studio production,[9] news workers welcomed the new operation of the studio production because it brought convenience and greater capability to respond promptly to changes.

In the final archive step, all files were managed by the media management staff of eight ex-assistant producers and former video editors. They were responsible for saving useful content footage to a near-line archive or to a data tape archive. They also undertook daily database housekeeping to make sure sufficient storage space was available. Another advantage of implementing the new TV newsroom was that it made it easier to re-distribute and re-purpose news content for multiple platforms, like Web broadcasting and mobile news.

ETTV News

ETTV's news manager acknowledged the difficulties in finalizing the customized workflow resulting from the introduction of the integrated

newsroom as it went through many negotiations and adjustments among news assignment desks, news line producers in different channels and the studio production crews.[10] One major barrier emerged with the LR edit, which the video journalists said slowed down the production and gave them a disadvantage against the news competition. After trial-and-error for months, it was decided to abandon the LR editing procedure to smooth the workflow. The finalized process thus had one fewer main steps than at MediaCorp: filming, ingestion, browse, HR edit, playout and archive.

Because ETTV retained its existing text/rundown system, the move to a second-generation integrated newsroom changed video production much more than text production. News idea generation, news judgment, news coverage and the text production stage changed little. News reporters still wrote scripts, and the editors and producers still vetted text and arranged rundowns using the existing text/rundown system, but video journalists[11] who were paired with reporters were responsible for ingesting HR footage from digital tapes to non-linear editing systems in the station's twenty editing bays. This new step, ingestion, is time-consuming: it requires as much time to transfer the footage from the tape to digital files as the time of the tapes themselves. This aroused complaints and resistance from video journalists and video editors who found that it seriously slowed down news production times, compromising immediacy and increasing deadline pressure. In order to shorten ingestion time, some video journalists were equipped with upgraded cameras which saved footage directly to CDs.

In the browse step, end users (reporters, editors, video journalists, writers and producers) could view newly digitized footage and use an interface developed by ETTV to search for relevant historical pictures for news production, significantly reducing the time needed for tape duplication and the conflict of fighting for tapes. The deputy head of general news said, "The biggest impact is the increased speed, which results from [having] no need to copy numerous tapes for multiple platforms. It is particularly useful for multi-channel TV news production".[12]

For HR editing, ETTV had both a system for video journalists and assistants to do basic news editing and an advanced system for craft video editors to compose complicated feature stories and for effects directors and assistant line producers to create two- and three-dimensional graphics. In foreign news output, which used foreign feeds or news sources which had to be translated, re-edited and re-dubbed in local languages, writers were expected to ingest and edit footage, although sometimes video editors assisted those who could not edit independently. According to ETTV's director of Photography and Digital Data Center, the use of non-linear editing not only enhanced visual presentation but also accelerated the whole process: "Once my news has problems that require modifications or updates, I can do it faster by using digital equipment. Unlike traditional tapes, it requires a one-to-one time ratio to deal with them in sequence. In fact, our research shows we only need half the time to modify news".[13]

Finished news clips were uploaded by video journalists directly to the central server. News supervisors and producers could monitor work-in-progress news clips on work-stations and ask video journalists to modify content as early as possible. The integrated news system was also useful to keep track of the progress of news editing, especially during prime time. Later, in the playout step, finished news clips which had been saved in the central server waited for assistant directors to retrieve them via a video server system in the sequence of rundowns for live broadcasting. Server- and file-based news production eased time pressure and reduced chaos and tension in newsrooms because people no longer ran around to chase tapes or send them to the control rooms for live broadcasting. When broadcasting, all directors had to look at line producers' rundowns and cue assistant directors to use the computer to put the correct news clips on air.

Finally, as the ANGS did not include a database, ETTV developed its own media asset management system which automatically stored daily broadcast content in its near-line database. The station recruited experienced staff to manage the database and digitize its existing 36,000 hours of tapes into an archive stored in the digital library. After digitizing, news content could easily be re-used and distributed over multiple TV channels or other platforms, such as its online website. ETTV's news vice general editor said this step increased searching speed for relevant pictures or archives and enhanced the package picture quality by having diverse shots.[14] However, because of the station's intranet's limited bandwidth, the streaming of ETTV's tape library often got stuck during the peak-hour production period. When this happened, the news workers were encouraged to borrow tapes instead. "Information traffic jams" occurred frequently in the initial implementation, but the situation improved after the internet connection was upgraded.

COMPARISON: SIMILARITIES AND DIFFERENCES

At an organizational level, it was evident that both stations benefited from the implementation of integrated newsrooms with regard to multiple footage sharing, content re-purposing and multi-platform distribution. Moreover, there was a shared tendency to introduce multi-tasking among employees. To effect adjustments in work practices reasonably and to smooth workflow, multi-skilling served as a solution to both optimize performance and minimize disruptive change. Importantly, in neither case did multi-skilling lead to reductions in employment. However, there were interdependent contextual and organizational differences between the two stations studied. ETTV's journalistic practices were more influenced by news competition and deadline stress than those of the near-monopolist MediaCorp. The ANGS system, which was first adopted in the west by stations such as CNN, took a long time to be customized for ETTV, while

the Thomson Aurora system, a new digital newsroom solution, was evolved specifically to fit MediaCorp's workflow and organizational needs. ETTV ended up finding the LR edit to be a misfit step and quickly abandoned it in order to reduce the disruption to its daily news operation. Against the background of differing media cultures, market competitiveness and organizational characteristics, the two stations used different methods to adjust their workflows, some work roles and their news practices.

The digital newsroom technology added extra steps in news production (i.e., ingestion, LR edit) and radical changes in editing and archiving, but it simplified digital broadcasting. It was clear that ingestion was the most dramatic alteration in news production. This led to changes in MediaCorp's organizational structure and work roles, but it evoked negative responses from ETTV's video journalists. ETTV had only a limited number of computers which could be used for browsing, non-linear editing and audiovisual content retrieval, whereas at MediaCorp every desktop computer was enabled for viewing and searching digital content and LR editing. As a result, ETTV news workers enjoyed less convenience and fewer of the advantages of resource sharing and multiple access to ingested footage than MediaCorp's staff. One reason for this was a different allocation of newsroom duties. At MediaCorp News, reporters who worked as news story producers with assigned camerapersons were responsible for editing rough cuts for their own news clips, whereas ETTV's news reporters maintained their routines for news coverage and script writing, putting huge stress on video journalists' shoulders to digitize footage and finish news editing before deadlines. Lastly, ETTV's large-scale transformation from archival tapes to digital files produced difficulties at peak hours.

Most of MediaCorp's journalists, after training and adjustments, were able to multi-task and overcome the problems in learning how to use non-linear editing and other challenges. Before implementing the integrated newsroom, MediaCorp conducted divisional training to teach reporters and other news workers how to use non-linear editing, digital broadcasting and the archiving system. CNA's writers and English reporters were the first to use basic techniques to edit rough cuts of news stories, and by March 2009, Malay, Tamil and Chinese reporters and producers had familiarized themselves with non-linear editing and other changes after digitization. The training results were "surprisingly good" and "impressive", according to the executive editor in English Local News, who found little resistance even among those she expected it from: "[What] I find personally very satisfying is that not only are the newer ones very enthusiastic about it, even the senior reporters [are]. . . . Surprisingly, they are very, very open to it, and this is very good".[15]

Those interviewed—five reporters from local English news, two producers from Chinese news and two writers in foreign news—all welcomed the new skills because they allowed them to have more control and autonomy in news creation. Senior reporter Tan, who covered local news and taught

colleagues how to use non-linear editing, considered the technical change to be an upgrading process for the better for reporters: "You take greater ownership of your things [news]. You have more responsibilities to take the ownership of the stories that you churn out".[16] The managers and supervisors in MediaCorp noticed that young reporters who had better computer literacy and previous training in non-linear editing were more capable in editing their news clips from desktop PCs professionally and efficiently. However, the older reporters were willing to learn. S. Ramesh, a senior political reporter working more than twenty-five years in MediaCorp, expressed his willingness to extend the old school of training to cope with the digital transformation in news practice: "I think at the end of the day . . . the greatest satisfaction will be for us to take ownership of our story from start to finish now".[17]

Although the implementation of the integrated newsroom caused radical changes in ETTV News workflow, its reporters actually had little adjusting to do. Unlike at MediaCorp, ETTV's news reporters did not need to edit news clips after digitization and so did not encounter multi-skilling. Instead, ETTV made its video journalists responsible for ingesting, editing and uploading news clips to servers. They had to get adept at non-linear editing very quickly and had to learn how to use archival pictures from the database for enhancement. Most of the video journalists interviewed praised the convenience of non-linear editing, including flexibility in content modification and enhancement in visual presentations, even though they were concerned about the trade-offs in speed and news immediacy. To speed up news editing and absorb extra editing work, ETTV News added a new position, the camera assistant, whose job was to ingest footage before editing and do urgent editing for newsroom staff, such as sound bites or teases.

Digitization gave ETTV News video journalists more time pressure in news production and more responsibilities in final quality control. The video journalists complained about multi-skilling, the added time for news ingestion and the alteration of their working habits. The director of videography said, "We [video journalists] are not familiar with the nonlinear systems and our old habits have been radically adjusted".[18] The engineering manager understood why the video journalists were unhappy that so much had to be done all at once with the stress of deadlines: "Video journalists had resistance toward nonlinear editing systems, as they had to cover news and get familiar with the new system at the same time".[19]

As experienced at MediaCorp, there was more resistance from long-standing employees, who were highly adept in tape production. ETTV's managerial staff found great differences between senior and young video journalists in terms of their abilities to adjust to non-linear editing. The news managers and the chief director of videography both said that young video journalists and new employees easily transited to the digital tool and minded less about multi-skilling. The chief editor considered the level of computer literacy as a key factor in responses: "The more senior the video

journalists, the more difficulties in their adaptation to changes. In comparison, new employees usually play with computers often. They have no obstacles to using computers to click and play files".[20]

On the other hand, MediaCorp News did not expect its journalists to become experts in the new technology. News managers and editors regarded editing as a secondary skill for the reporters who were trained to use nonlinear editing, and they only expected them to do rough cuts, record voiceovers and select interview sound bites. Even then the news supervisors who encouraged multi-skilling did not expect everyone to be adept in this new skill and accepted various levels of performance. "Because it's hard to expect everyone to be able to be multitask . . . we are not going to discriminate and say that, oh, you cannot multitask and so you are going to be out of a job", said the director of production resources and the integrated newsroom project manager.[21] A senior producer for CNA emphasized that journalists were still valued for their core activity. "[I]t would be terrible to lose a great skill because a person couldn't do a secondary skill. So I think that there are always levels of everything".[22] One junior reporter frankly admitted that while dealing with deadline stress, using non-linear editing to make news packages was difficult, and she needed extra help.[23]

Those who worked in the newsrooms who were not involved in newsgathering had more time for non-linear news editing and relatively less stress to meet deadlines. Thus, the adoption rate and the frequent usage of non-linear editing systems were higher among in-house professionals. In March 2009, other than MediaCorp's reporters in local news who still relied on video editors to edit urgent news clips and mix audio tracks, more than 90 percent of newsroom staff edited news by themselves, especially in CNA's foreign news output. According to the chief editor of local news and the vice chief editor of Chinese news output, their reporters covered breaking news with more immediacy and edited raw footage under huge time pressures, so a higher percentage of reporters in these two divisions asked for video editors' help.

Nevertheless, limitations to multi-skilling were acknowledged at MediaCorp. Due to an unfamiliarity with visual grammar and a deficiency in visual storytelling skills, when news workers used to working on text began editing, picture quality was compromised and, according to one craft video editor, several major technical errors were made on air.[24] Consequently, the managerial consensus was to have craft video editors edit urgent breaking news, especially local news, and assist some reporters with editing. The senior editor of English News Output said he found that English or Chinese reporters who covered local news required more back-up from video editors, but almost 90 percent of foreign-news producers could re-edit news clips independently due to having less pressure from deadlines.[25] The switch to non-linear editing by ETTV's video journalists did not affect audiovisual quality too much, but there was a tendency to overuse special effects in the beginning.

To optimize the workflow, some of ETTV's work roles (video journalists, assistant line producers) required more multi-skilling, and some new positions (assistant video journalists, effect directors, subtitle directors) were actually added. Moreover, ETTV News expanded the archive department for its systematic media asset management. Overall, the ETTV news managers and supervisors interviewed indicated that the implementation of the digital newsroom increased efficiency and productivity in news production and content sharing, especially after the workflow was finalized and work roles were appropriately adjusted.[26] However, the embrace of multi-skilling among ETTV's news workers was not as active and positive as the responses in MediaCorp News. Although directors' work was not affected much by the digital transition, the assistant directors no longer examined tapes, only checked the availability of news files and retrieved them in sequence for live broadcasting. Their work roles and job content were adjusted: some became effects directors and some worked on subtitles. These two new roles were added to smooth the digital workflow in studio production.

Multi-skilling was normal for MediaCorp's studio crews, who were used to playing multiple work roles and rotating constantly. According to the senior manager of studio productions, the crews tended to be versatile in multiple tasks, such as lighting, video mixing, sound and tape playout. They enjoyed the efficiency and convenience brought by server playout and digital broadcasting without worrying about job loss caused by technological changes.[27] Due to their previous knowledge and hands-on experience in server broadcasting, their adjustments were easier than those made by journalists. Overall, MediaCorp's news workers did not have many complaints and welcomed the challenges of multi-skilling because of the flexibility, autonomy and convenience brought about by the integrated newsroom. Even the most affected work roles (reporters, video editors and media management staff) adjusted willingly to the new workflow. In MediaCorp News, multi-skilling dismantled the demarcation among reporters, writers and technicians (video editors) as the former two had to start to edit news clips by themselves.

DISCUSSION

At the managerial level, there was considerable agreement in the two stations about the benefits arising out of the introduction of integrated newsrooms. MediaCorp's managers thought the adjustments in news work and work roles had positive effects on restructuring manpower and re-designing an optimized workflow.[28] The video viewing functionality of computer work-stations significantly improved editorial decisions in selecting news, arranging rundowns and improving text and picture quality. ETTV's managerial and news editorial staff (news editors, line producers and producers)

welcomed the implementation of digital newsroom because it allowed them to monitor, examine and vet news earlier and request modifications sooner. News supervisors and editors could keep track of news editing and examine audiovisual content digitally. The director of videography said, "After the primetime news rundown comes out, I should stand by [for] one hour before broadcasting. Then I have to keep an eye on which news has been edited, based on the sequence of the rundown, to ensure the readiness of news stories".[29] Producers could watch news clips and choose a good mix of stories for rundowns instead of selecting news based on scripts only. "The salient advantage is that [the producers] don't have to wait in line to watch videos. They can use computers to view video files. . . . This is the biggest help", said the chief editor of ETTV News".[30]

At both stations, however, the implementation of the digital newsroom did not involve any cuts in staffing. ETTV news manager Wang concluded, "Digitization does not save labor as some people expected, but only causes the adjustment of some work roles".[31] Therefore, the critical factor emerging from this study was the extent and nature of those "adjustments" and how they related to the wider contexts of television news production. These were primarily arrayed around a number of factors—organizational culture (including commitment to training and expectations of multi-skilling), organizational practices (who was assigned to non-linear editing—reporters and writers in Media Corp and video journalists and assistant line producers in ETTV) and organizational structures (where broadcasting and archiving responsibilities were located—with studio crews and media management staff at MediaCorp and assistant directors and database staff in ETTV). These were the pressure points in the digitization process where multi-skilling was most evident.

Conversely, there were no effects caused by multi-skilling on news idea generation, newsgathering, news writing and news judgment. For both MediaCorp's reporters and ETTV's video journalists who went out covering news or shooting footage, there were higher levels of pressure to meet deadlines, and, as a result, they tended to have higher resistance to the changes and negative responses to multi-skilling. Even after initial training, most of MediaCorp's reporters on the local desk and ETTV's video journalists still found non-linear editing a big challenge, the former facing a steep learning curve in harnessing the new skill and the latter having to drastically change entrenched working habits.

What differed in the two stations was that MediaCorp's news supervisors accepted reporters' different levels of performance in the new skills, but ETTV's video journalists were required to have a good command of non-linear editing. As reporters' traditional journalistic practices were emphasized more than their technical skills in editing, MediaCorp kept video editors as a safety net for reporters so that they could seek professional assistance to either complete urgent news clips or polish audiovisual presentations. However, if ETTV's video journalists failed to master non-

linear editing independently, they would be considered incompetent to ful-fill their primary duty.

After the implementation of digital broadcasting, multi-skilling caused little change in MediaCorp's control room and newsroom dynamic, but ETTV's transition was more chaotic, and some crews required more adjust-ments in adapting to new tasks. MediaCorp's studio crews were versatile and multi-tasking in various studio jobs even before the implementation of digital newsrooms. As multi-skilling was normal for them, the learning gap was manageable and thus there was no salient impact after digitization. In contrast, ETTV's assistant directors' primary work became mechani-cal and their positions replaceable after they started using server playouts. Later, they were given additional work editing teases and making special effects, graphics or subtitles. These multi-skilling adjustments aimed to bal-ance their workload.

Finally, MediaCorp's media management team was established to meet the needs of footage ingestion and audiovisual data management. The staff encountered dramatic work changes and learned multiple skills to handle ingestion, data house cleaning and archiving but realized that their work function was the hub for MediaCorp's new workflow, and thus embraced the challenges of multi-skilling with a positive mindset. On the other hand, ETTV News invested a huge amount of money and manpower to set up the digital library and the search interface as well as transform all existing archives. There was no multi-skilling evidence among ETTV's digital archiving staff. However, it must be noted that MediaCorp, as part of the government, faces far fewer pressures in terms of news competition and funding than ETTV, which operates in a lively political and commercial arena.

It was evident that MediaCorp took a more lenient approach to adapting the reporters and media management staff to their multi-skilling jobs. Even though their work was altered to a great extent, their resistance to multi-tasking was mild because of proper user education in digitization and the tolerant attitude to trial-and-error. Besides, it was a clever strategy to rotate MediaCorp's studio crews' work roles as their versatility could easily han-dle the multi-skilling operation. In ETTV's case, compulsory digital trans-formation used a hard push so that the work alteration in multi-skilling or new division operation caused more painful and negative user responses. After a period of time when users got familiar with their work changes, multi-skilling in digital news production boosted news productivity as well as content and picture quality recovered.

CONCLUSION

Deuze (2008, 11) argued that digital technology supplemented the news-making process rather than making radical changes to it. This study found

that that was the case. Both stations went through a long negotiation process and many adjustments to optimize the workflow and production process to meet their organizational needs. When integrated newsroom steering committees drew up customized workflows, they aimed to make few changes in practices and organizational structure and to speed up the digital transition. This led to multi-skilling in some work roles. Because digitization improved MediaCorp News's unsatisfactory analog workflow, its news crews did not mind multi-tasking in exchange for more control in newsmaking and solving videotape problems. However, ETTV news workers were not so motivated to change their reliable analog workflow. Without strong advantages in digital migration, it was inevitable that news workers would be more resistant to change.

Other TV newsroom studies have argued that multi-skilling added to journalists' workload and de-skilled them (Saltzis and Dickinson 2008, 221–3; Ursell 2001, 192–3), as well as de-generated news performance (Cottle and Ashton1999, 26; Avilés et al. 2004, 365). However, in the cases of MediaCorp News and ETTV News, as a result of digitization, news performance was sacrificed in a few cases, mostly related to audio-visual quality, but overall multi-skilling involving changes in workflow and journalistic practices was a solution to the challenge of adjusting news production to the new conditions of digital technologies and digitization processes.

The impacts of multi-skilling were highly related to the organizational cultures, practices and structures which shaped the implementation of technological innovation. Intriguingly, they appeared to be far more weakly related to the differences in the wider contexts of media ownerships and markets. To be sure, MediaCorp, funded by the Singapore government and situated in a monopolized news market, spent more time selecting and implementing integrated newsrooms than did ETTV, which operates in a highly competitive commercial news environment. MediaCorp staff were trained to use the integrated newsroom technology over a longer period and were generally under less time pressure in their news production. ETTV took only months for the digital transition and required its news workers to produce daily news at the same time. Yet where competition and time pressures are commonly believed to be most acute—in reporting—the impacts of digitization were least in both stations, and neither MediaCorp nor ETTV shed journalists' jobs.

A tentative conclusion to be drawn from this cross-national, cross-market study is that generalizations about the negative effects of the introduction of integrated digital news operations may be misplaced and that market conditions are potentially less influential than organizational and political factors. Among the latter, investment in news, at least in the form of the continued employment of journalists, appears to be constant. Therefore, if international news flows and counter flows are deficient, digital technologies are probably not the cause.

NOTES

1. Cheng Yong Tai, interview with author, MediaCorp, Singapore, March 3, 2009.
2. Yusof Norraine, interview with author, MediaCorp, Singapore, March 3, 2009.
3. Leng Lilyn, interview with author, MediaCorp, Singapore, December 7, 2007.
4. Rosmawati Sulaiman, interview with author, MediaCorp, Singapore, March 4, 2009.
5. Donald Low, interview with author, MediaCorp, Singapore, March 4, 2009.
6. Rosmawati Sulaiman, interview with author, MediaCorp, Singapore, April 24, 2008.
7. Low: see footnote 5.
8. Sulaiman: see footnote 4.
9. Patricia Lin, interview with author, MediaCorp, Singapore, April 28, 2008.
10. Matthew Wang, interview with author, Eastern TV, Taiwan, June 29, 2006.
11. MediaCorp's "camerapersons" are responsible only for shooting footage, which is different from ETTV's video journalists who film, ingest and edit. The latter participate in news content and co-construct TV news stories with reporters.
12. Robert Yang, interview with author, Eastern TV, Taiwan, June 29, 2006.
13. Chen Wen Hsieh, interview with author, Eastern TV, Taiwan, June 30, 2006.
14. Yang: see footnote 12.
15. Sulaiman: see footnote 4.
16. Valery Tan, interview with author, MediaCorp, Singapore, December 5, 2007.
17. S. Ramesh, interview with author, MediaCorp, Singapore, December 5, 2007.
18. Hsieh: see footnote 13.
19. Kevin Lai, interview with author, Eastern TV, Taiwan, June 27, 2006.
20. Hsin-Guey Hong, interview with author, Eastern TV, Taiwan, June 21, 2006.
21. Yusof: see footnote 2.
22. Low: see footnote 5.
23. Margaret Perry, interview with author MediaCorp, Singapore, December 5, 2007.
24. Craft video editor, interview with author, MediaCorp, Singapore, March, 4, 2009.
25. Sulaiman: see footnote 4.
26. Wang: see footnote 10; Hong: see footnote 27; Yang: see footnote 12.
27. Patricia Lin, interview with author, MediaCorp, Singapore, December 7, 2007.
28. Yusof: see footnote 2; Sulaiman: see footnote 4; Low: see footnote 5.
29. Hsieh: see footnote 13.
30. Hong: see footnote 20.
31. Wang: see footnote 10.

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