

# The Temporal Landscape of Residential Aged Care Facilities – Implications for Context-Sensitive Health Technology

Andrew GEORGIU<sup>a,1</sup>, Amina TARIQ<sup>a</sup> and Johanna I WESTBROOK<sup>a</sup>  
<sup>a</sup>Centre for Health Systems & Safety Research, Australian Institute of Health Innovation, University of New South Wales, Sydney, Australia

**Abstract.** Health information technology (IT) can have a profound effect on the temporal flow and organisation of work. Yet research into the context, meaning and significance of temporal factors remains limited, most likely because of its complexity. This study outlines the role of communications in the context of the temporal and organizational landscape of seven Australian residential aged care facilities displaying a range of information exchange practices and health IT capacity. The study used qualitative and observational methods to identify temporal factors associated with internal and external modes of communication across the facilities and to explore the use of artifacts. The study concludes with a depiction of the temporal landscape of residential aged care particularly in regards to the way that work is allocated, prioritized, sequenced and coordinated. We argue that the temporal landscape involves key context-sensitive factors that are critical to understanding the way that humans accommodate to, and deal with health technologies, and which are therefore important for the delivery of safe and effective care.

**Keywords.** Long term care; Time; Evaluation studies; Communications; Aged care informatics; Organizational innovation.

## Introduction

One of the most challenging features of health Information Technology (IT) systems is their effect on the *temporal landscape*, that is how time is conceived, structured and organized, and the impact this has on human factors and the way that work is carried out [1]. New IT systems increase the velocity and volume of data transfers, allowing for large-scale storage of information across numerous locations. They have the ability to improve efficiency, particularly in relation to the speed and timeliness of information exchange and organizational output [2]. This potential often leads to the presumption that new technologies speed up activities and increase reliance on some practices (e.g., computer entry) to the detriment of other tasks (e.g., patient care) [3]. It may also lead to trepidation about the pace of activity and concern about ‘data inundation’ alongside temporal disorganization because of the propensity of IT systems to encourage ‘juggling’ and multi-tasking of activities [4].

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<sup>1</sup> Corresponding author: Andrew GEORGIU. Email: [a.georgiou@unsw.edu.au](mailto:a.georgiou@unsw.edu.au)

Despite the potential of IT to improve the coordination and integration of aged care services, prior research has shown that its uptake has continued to be slow and fragmented [5]. There is a corresponding scarcity of research evidence to help understand the interdisciplinary nature of aged care and the way that work is structured, communicated and organized [6]. Studies of the temporal landscape and of information exchange can make a valuable contribution to our understanding of the context-sensitive factors that shape work processes in aged care facilities [7]. The influence that temporal factors have on organizations is complex and often difficult to identify, which may explain why they have not been widely researched. This study aimed to answer the following questions: What is the role of information exchange on the temporal and organizational landscape of residential care facilities? What are the temporal mechanisms that can impact on the functioning of health IT?

## **1. Methods**

### *1.1. Design and setting*

This study involved seven Australian residential aged care facilities (RACFs) including five metropolitan sites, one inner city and one rural site. The sites included a range of 'high care' services for people requiring 24-hour nursing care, and 'low care' services for people who need help but are still able to walk or move about on their own. The RACFs varied in size from 50 to over 300 residents and had contrasting levels of IT uptake ranging from one predominantly paper-based site to five sites that had a hybrid (paper and computer) system and one which was largely paperless.

### *1.2. Sample*

Purposive sampling techniques ensured the inclusion of participants involved in a range of care processes. The study involved 11 focus groups and 54 interviews and observation sessions over the period July to November 2010, which included a total of 12 managers, 32 Registered Nurses, 6 Enrolled Nurses, 21 Personal Care Assistants, 22 other aged care staff (including Health Information Officers, receptionists and a Recreation Activity Officer) and seven clinical care providers (including two General Practitioners [GPs], two Occupational Therapists, one Exercise Physiologist and two Physiotherapists). Ethics approval for this project was obtained from the Human Research Ethics Committees of the University of Sydney (HREC 12862) and the University of New South Wales, Australia (HREC 10319).

### *1.3. Data collection and analysis*

Semi-structured interviews and focus groups were based on a set of questions about the collection, storage, management and communication of data, the artifacts required (e.g., telephone, files, fax, white board etc.) and their relationship to the care of clients. Focus groups included small groups (of up to 6 participants) often from the same profession (e.g., nurses, care givers) as a means of creating a group dynamic to stimulate discussion and investigate issues in depth. Non-participant observation sessions were embedded into the interview process and involved demonstrations and visualizations of

topics discussed, e.g., how communication artifacts are used and the circumstances involved. All sessions were recorded using a digital voice recorder and were professionally transcribed. NVivo software was used to undertake a preliminary open coding of the transcriptions which were then combined into an axial coding system that highlighted selective relationships and consistent patterns [8]. The analyses and results of the study were reported and discussed individually with key participants from each of the study sites.

## 2. Results

Aged care facilities undertake a complex set of activities involving the transfer of people, resources, artifacts and information across the facility and the community. These activities need to be coordinated among a large number of staff, residents and their families. Information exchange plays a key role in managing these activities and in ensuring that people are provided with the data they need to access the right people and locate the appropriate resources and knowledge when required.

### 2.1. Internal modes of communication

The scope of internal modes of communication (within the facility and amongst personnel) included the care plan, face-to-face communication, diaries/folders, whiteboards and notice boards (see Figure 1) progress notes (as shown in Figure 2), care alerts, appointment calendars, minutes of meetings, email and pagers.

#### 2.1.1. The care plan – continuity of care

The care plan is established once residents have been assessed and their health issues identified. It provides instruction as to how the care needs of the resident will be met and is updated regularly to reflect changing needs and circumstances.



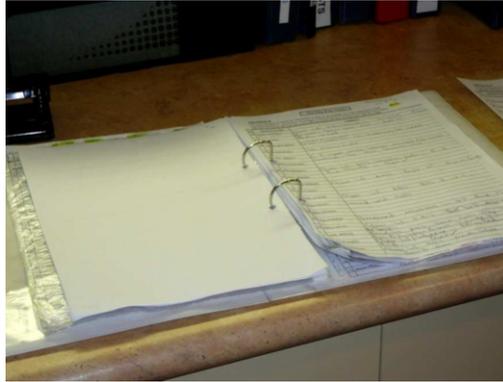
**Figure 1.** Staff notices communicating processes and procedures



**Figure 2.** Staff notice drawing attention to importance of documentation in progress notes

### 2.1.2. Handover meetings - the coordination of care

The handover meeting is an important means of exchanging and sharing information that occurs at the end of every shift. The information may relate to an event or occurrence (e.g., medication change) or something that may be associated to a future event (e.g., allied health visit). For many facilities handovers involved the use of a handover sheet (see Figure 3).



**Figure 3.** Folder containing information used for care handovers

### 2.1.3. Communication diaries/folders and the allocation of care

There are a number of communication diaries and folders which are used for a variety of different purposes:

*'We have folders for a visiting optician. We put referrals in there after we phone them...We have a folder for the dietician, one for the physiotherapist. We have a folder for every doctor that comes here for any concerns that, not urgent, things that can wait...we have a lot of communication folders'.* [Personal Care Assistant, site F]

### 2.1.4. Other forms of communication

In some facilities whiteboards and notice boards, signs and posters (see Figure 2) were used as a means of communicating information. Other forms of communication included: Digitally Enhanced Cordless Telephones (DECT), face to face encounters, staff meetings and email.

## 2.2. External modes of communication

Aged care facilities are also involved in transitional care which entails residents moving to another site (e.g., hospital) where coordination and continuity of care is important and failure to communicate key clinical data may increase the potential for harm. Participants also reported on the importance of communicating with friends and relatives of residents, providing them with information about a resident's state of health and wellbeing, or helping to coordinate aspects of their care. The methods for communicating with people external to the facility included letters and other posted correspondence (snail mail), email, communication diaries, telephone and the fax.

### 2.3. Temporal planning of the care process

The information-intensive nature of the aged care facility requires a high level of data management particularly related to how data are collated and exchanged. This plays a big role in how the facility's work is planned, organized, staffed and coordinated.

*'The Executive Care Manager, myself and the social worker draw up a twenty four hour progress notes report every morning, go through it, see if there's anything that needs to be followed up and go to the appropriate people, notify them what you want followed up and ask them to use the...messaging system to let us know when it's been done'. [Deputy Care Manager, site B]*

This often involves the coordination and synchronization of numerous cross-professional and cross-institutional work processes.

*'Whereas before if a resident had a fall, a referral was written for the physio to come and do a falls risk assessment that might not have been collected until the following morning and they've got it, maybe lunchtime the next day that the resident would get reviewed whereas now...there's a message that gets sent through...automatically to the physios as soon as the incident form's filled in and ticked. The physios automatically get a message saying the resident's had a fall, please follow up, do a falls risk assessment....'[Focus group participant, site B]*

### 2.4. Access to artifacts, knowledge and people

Mobility was discussed with reference to the impact that information systems may have on the ability to access information, people, equipment and knowledge. The documentation of activities is a time consuming process that nurses often left to a time of day after other pressing tasks have been completed. Sometimes it relied on finding a suitable location where documentation duties can be undertaken.

*'I find it frustrating at times when there's not enough computers available or the computer crashes and where you used to just go pick your folder and jot your notes down and you weren't really competing with other staff to grab a computer ...'[Personal Care Assistant, site E]*

## 3. Discussion

The findings from this study identify the role of internal and external (across to other sectors of the community) modes of communication and artifacts (phones, faxes, whiteboards etc.) that comprise important facets of aged care service delivery. Each of these communication modes and artifacts contribute to the temporal landscape and the way that work is allocated, accessed (e.g., where computers are spatially located), coordinated (e.g., how key messages are communicated at the time required), integrated (e.g., how care is transitioned and organized across the community), sequenced and prioritized (e.g., how care is managed by multi-disciplinary teams of care givers to ensure safe and time sensitive administration of medications). As in other care settings, (e.g., primary care) handover in aged care facilities involves the communication of information about people and their history that is critical to the coordination and continuity of safe care. It also entails the transfer of professional responsibility and accountability which can occur between teams of care givers, at points of resident transition (e.g., to another setting) or between different levels of care

[9, 10]. This study shows that handovers in aged care involve temporal requirements that are relevant and usually specific to each aged care facility.

The temporal dimensions of care can be conceived either as objective factors (as measured by seconds, minutes and hours) which are mechanical, linear and quantitative [11], or as qualitative phenomena (as perceived and understood by a set of individuals) that may be rhythmic (e.g., before or after a shift change) and discontinuous (e.g., when the occasion warrants) [12, 13]. An example of this is the planning associated with the provision of allied health professional care which requires the notification of a problem, arrangement of an appointment, communication of a report and the update of records. This temporal landscape shapes the way that humans accommodate to and deal with technology. It is therefore a critical element to ensuring effective communication and safe care delivery [7].

#### 4. Conclusion

Temporal factors constitute an important part of the way an organization functions. Alterations in the temporal landscape are connected to changes in the ways that tasks are *allocated, prioritized, sequenced* and *coordinated*. [7] This has major implications for the successful design and implementation of new information technologies because of their capacity to dramatically alter the way that work is carried out. [2]

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