Chapter 6
Critical Concepts in M–Health Technology Development:
Time, Space, and Mobility

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ABSTRACT

This chapter is a theoretical in-depth review of three conceptual groups that serve as the fundamental basis for m-health technology development—both at hardware and software levels—as well as for technology adaptation to work/life practices, and for adoption and usage studies. Objectively the review will focus on the concepts of Time (clock, event, practice-based, and timeless time), experiences of time (subjective construction of the "past," "present," and "future," time aggregation/"episodification" frequency, rhythm, cycles, "spiraling," and mono-polichronicity), space, and mobility (namely physical mobility, remote versus local, modalities of travelling/visiting/ wandering, micro-mobility).

INTRODUCTION

The most significant difference between MICT and desktop-based ICT is the fact that the computing devices can move while retaining connectivity to networks or act as isolated computing devices. In both cases, MICT introduces a new dimension to Information Systems (IS)—mobility—and,

thus, has the potential to disrupt spatial and temporal arrangements of both actors and their actions. Since spatial and temporal dimensions of the organisation of doctors' work practices have been shown to influence how they use pen-and-paper and desktop ICTs (Westbrook, et al., 2004; Martins, et al., 2005), and, since MICT can potentially change where and when work can be done, it seems valuable to explore some theories about time, space and mobility.

Orlikowski highlights the importance of looking at time in organizations (Orlikowski & Yates, 2002), and this is reinforced in the medical context by Strauss *et al*. (1997). Another reason why it is crucial to look at time is its intricate relationship with space and mobility. Time and space are intuitively connected in our everyday life experience. Giddens (1984) notes that movement in time always accompanies movement in space and, thus, that these are interrelated concepts which need to be studied together. Mol, however, has suggested that space can also be conceived as social topologies (Mol & Law, 1994) regardless of any physical dimension, and therefore understanding of workspace in such terms is a potentially additional tool to look at the use of MICT for work. Similarly, Castells (1996) suggests that "*spatial forms and processes are formed by the dynamics of the overall social structure.*" It is therefore important to understand space in order to understand action taking place, its location and position, and from thereon (Dix, 2000) actors' mobility modalities.

CONCEPTS OF TIME

The concept of time has not been stable though history as Lee and Liebenau (1999) describe. Time has also been studied in a variety of disciplines from mathematics, biology and psychology to anthropology and sociology (Orlikowski & Yates, 2002) as well as management and organizations (Bluedorn & Denhardt, 1988). There are several conceptualisations of time in the literature that are seen as shaping the way in which work, and more broadly all human activities, can be understood (George & Jones, 2000; Orlikowski & Yates, 2002). How we conceptualise time may in turn have implications for how we use other conceptual models, like those of space, mobility and even participants: be they individuals, groups or communities (George & Jones, 2000). This section does not aspire to be an exhaustive review of the time literature but rather summarizes concepts of time and temporalities that have been claimed to be particularly related and relevant to the analysis of work and organizations.

"Clock-time" and "event time": Probably the most discussed division in conceptualisations of time is that of clock time against social or event time in its broadest sense. Several authors have written about clock time and event time (Bluedorn & Denhardt, 1988; Lee & Liebenau, 1999). A commonly held description of clock-time is provided by Lee who mentions clock-time is often conceptualised as "*homogeneous and divisible in structure, linear and uniform in its flow, objective and absolute, that is, existing independent of objects and events, measurable (or quantifiable), and as singular*" (Lee & Liebenau, 1999), thus, there would be one, and only one, "correct time." This conceptualisation has been dominant in contemporary society and derives more from the natural sciences than from sociological concerns. It has, however, a strong relation with two aspects in management and organization analysis. It relates with the notion of time as a resource—the "time is money" metaphor—which means time can be spent, saved, wasted, possessed, budgeted, used up and invested. People often understand time in financial terms in everyday life. In addition, due to the work of Marx and others, this conceptualisation explains the close relationship between time and productivity.

The concept of social time, or event time, as it is generally referred to, although more loosely defined, arose as an alternative perspective to the rigidity of "clock-time" that was felt to be inadequate for social analysis. Bluedorn and Denhardt present it as "fundamentally a social construction that varies tremendously between and within societies" (Bluedorn & Denhardt, 1988). Examples of this would be dinnertime or prime time TV, which may vary between groups of people in their duration and in when (with regards to clock-time) they happen although they retain a shared meaning within the particular groups of individuals. Under this perspective, time is a subjective essence constructed

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