# Chapter 4
# Critical Issues in Mobile Solution-Based Clinical Decision Support Systems: A Scoping Review

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## ABSTRACT

*The use of mobile solutions for clinical decision support is still a rather nascent area within digital health. Shedding light on this important application of mobile technology, this chapter presents the initial findings of a scoping review. The review's primary objective is to identify the state of the art of mobile solution based clinical decision support systems and the persisting critical issues. The authors contribute by classifying identified critical issues into two matrices. Firstly, the issues are classified according to a matrix the authors developed, to be indicative of the stage (or timing) at which the issues occur along the timeline of mobile solution development. This classification includes the three classes: issues persisting at the (1) stage of developing mobile solutions, (2) stage of evaluating developed solutions, and (3) stage of adoption of developed solutions. Secondly, the authors present a classification of the same issues according to a standard socio-technical matrix containing the three classes: (1) technological, (2) process, and (3) people issues.*

DOI: 10.4018/978-1-5225-6067-8.ch004

## INTRODUCTION

The need for relevant data, pertinent information and germane knowledge as rapidly, complete and accurate as possible is essential to make sound an often lifesaving clinical decisions (Moghimi, De Steiger, Schaffer, & Wickramasinghe, 2013). Digital information can transform the quality and sustainability of health and care. National strategic plans have been put in place in recent years to enable the digital transformation of healthcare across the world, especially in Australia (Australia's National Digital Health Strategy, 2018). Investment in this interest is significant, and partnerships between governments, healthcare providers, and research institutions are evident (Digital Health CRC, 2020). The project CLOTS (Consultation on haematological Optimization and Thrombosis in Surgery) (Digital Health CRC, 2020), is a prime example for such investment and partnership relating to the digital transformation of healthcare.

A pivotal component playing a part in the digital transformation of healthcare is the use of mobile solutions for clinical decision support. On general observation, it is fair to comment that the state of the use of mobile solutions for clinical decision support, is still at a stage of nascency. A common consensus is that this is largely due to not a lack of technology solutions, but the fact that healthcare being quite a conservative domain. Clinical decision-making has been developed on a set of evidence-based practices (Clancy & Cronin, 2005), and is reinforced through regulation. This nature, along with a degree of reluctance shown by clinicians to adopt mobile technologies to assist their work (Jacob, Sanchez-Vazquez, & Ivory, 2019) may have been barriers preventing a strong entry for mobile solutions to support clinical decision-making to date. However, given the general adoption and diffusion of mobile solutions and the fact that clinicians are more and more time pressed at present, it is becoming essential for them to have quick, convenient and robust decision support solutions, and thus more attention is now being focused on mobile solutions to fill the void and address the needs of the sector (Blagec, Romagnoli, Boyce, & Samwald, 2016). As part of an ongoing research study (Digital Health CRC, 2020) relevant to the premise, focussing on designing and developing mobile decision support solutions for clinicians, the authors present in this chapter a preliminary scoping review, done via a survey of peer reviewed literature, in order to identify the state-of-the-art of using mobile solutions for clinical decision support, and the persisting issues that would require attention and improvement in this avenue. In doing so, authors begin to answer the research question: "How can we design and develop suitable mobile solutions to better support clinical decision making?"

The scope of this review as intended by the authors (prior to surveying literature), can be summarized as follows: Relates to solutions used inside hospitals (i.e., secondary and/or tertiary care); involves the use of mobile solutions (e.g., ubiquitous devices such as Tablets and mobile phones, as well as Apps that may or may not be supported by a cloud computation and/or database facility, in relation to electronic health records for instance); inputs to solutions may be fed by patients and/or clinicians only; and, serves as some form of a decision support tool for clinicians. In the subsequent sections of this chapter, the authors present how they performed a systematic review of literature covering the prior scoping the authors had formed, and discuss the findings. The objective of conducting this review can be presented to be two-fold: (1) Identifying the state-of-the-art of mobile solution based clinical decision support systems; (2) Identifying critical issues. What the authors identify as issues in this chapter, are the ones that have been raised in the Discussion and Limitations sections in recent literature. As such, the issues identified by the authors are quite likely ones that have not yet been solved at present. While the authors do not intend to propose solutions to such issues within this chapter, the authors intend to identify and