



## LETTER TO THE EDITOR

### The development of a national telemedicine service maturity model

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## TO THE EDITOR:

The notion of ‘maturity’ was first proposed by Phillip Crosby and is defined as ‘the state of being complete, perfect, or ready’. In a more general view, a maturity model (MM) is a conceptual framework that consists of a sequence of discrete maturity levels for a class of processes in one or more business domains, and represents an anticipated, desired or typical evolutionary path for these processes (1). Being mature is hereby defined as “having reached the most advanced stage in a process” (2). A maturity model describes a path to reach an advanced stage of maturity, including the definition of the current status quo, an overview of next steps, and the provision of a common understanding for different stakeholders to work on. The entity under consideration can be people, processes or objects (3, 4).

MMs (also referred to as ‘capability frameworks’) have been widely used in many domains such as industrial engineering, software engineering and information technology (IT)) for the purpose of process assessment and improvement (1).

Depending on the model’s design, three types of models have been differentiated: Capability Maturity Model (CMM)-like models, Likert like questionnaires, and maturity grids. CMM-like models are based on a formal design: a specific number of levels are described, with no further details for each activity per level. Likert-like questionnaires are seen as simple maturity models where each question displays a good practice and needs to be ranked by the respondent with a score, mostly from 1 to n. No additional information for each score is provided. Maturity grids describe each level of each dimension in a textual manner and further guide the assessment process (2). MMs have also been proposed in the health care domain with the purpose of assessing and improving the maturity of health care practices, operations and infrastructure. The maturity of practices and infrastructure in the health care domain directly impacts the quality and efficiency of health care services. Therefore, various health care administrations (e.g. from hospital management to the nationwide health authority) need to assess and improve their operational maturity. The maturity of practices, operations and infrastructure in the health care domain is of high importance. However, these qualities often vary among health care provider units (e.g. hospitals) and in some cases are far from perfect. Establishing process thinking and achieving quality management is vital to assure service maturity and to improve service maturity continually in such a complex, dynamic and multidisciplinary domain (1).

Governments have decided to reform their health care system to improve transparency, quality, safety, patient satisfaction, and, above all, cost control. Health sector, stimulated by the successful implementations experienced in other industries, have developed some organizational models, such as, the patient-focused hospital or clinical pathways to introduce process management into hospitals. Within the healthcare sector, several maturity models have been developed, although these models are still at an early stage of development (5).

Some of these MMs focus on the specific sub-areas, such as telemedicine, care pathways, digital imaging, picture archiving and communication systems and facilities management. Given the large body of knowledge in this area, there is a need to review the scope and characteristics of available models together with their use and usefulness. Healthcare practitioners, decision makers and researchers can choose the ‘right’ models that are most suitable for their needs or develop new models with further specialties (1).

Telemedicine systems and services cover a broad spectrum of capabilities including acquisition, storage, presentation, and management of patient information (represented in different digital media such as video, audio, or data), and communication of this information between care facilities with the use of communications links. Although, telemedicine has the potential to



solve diverse problems in modern health care, their quality remains a challenge considering their potential impact on human health, highlighting concern over the safety, reliability, privacy, security, efficiency and effectiveness of telemedicine technology. Remote patient monitoring (RPM) and virtual visits have the potential to transform care delivery and outcomes and require intentional planning around how these technologies contribute to integrated care (13). Given these concerns, there exists a legitimate interest in protecting the public from unsafe and untested telemedicine technologies (6). Maturity models are useful frameworks for understanding current performance and motivating progress (7).

Supporting tools for telemedicine scaling up should include the provision of improvement measures, by helping users understand which steps could be taken in what context and by guiding them during the implementation process. As one such support tool, a maturity model describes a path to reach an advanced stage of maturity, including the definition of the current status, an overview of next steps, and the provision of a common understanding for different stakeholders to work on (2).

This paper intended to contribute towards a deeper understanding of the process management maturity as a vehicle to achieve operational excellence in the health care domain, including a capability that can be used to measure and manage the maturity of any telemedicine process.

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