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It's more than just use: An exploration of telemedicine use quality

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Abstract

"*Simply saying that more use will yield more benefits without considering the nature of this use (and context) is clearly insufficient*" [W.H. DeLone, E.R. McLean, The DeLone and McLean model of information system success: a ten-year update, Journal of Management Information Systems 19 (4) (2003) 9–30, p. 16]. Our research specifies the *use quality* construct in the context of a mission critical system deployment—namely, the use of medical video conferencing for patient exams. The product of this field study is a socio-technical framework for *use quality* in telemedicine service encounters. We also propose generalized categories (which may extend across domains) for identified attributes, provide a comparative overview of patient and provider perspectives, and discuss the effects of and remedies for selected attribute deficiencies.

Keywords: Telemedicine; Use quality; Video conferencing; Service encounter; IS success model

1. Introduction

> "Quality is never an accident; it is always the result of intelligent effort."—John Ruskin

In medical informatics, the manner in which a technological intervention is used can have a significant impact on the health and well being of patients who depend on it. If we are to effectively manage technology-based medical information systems, we must understand and manage their use, especially as it applies to encounters between health care providers and patients.[3] A critical and increasingly important application of medical informatics is the use of video conferencing for patient exams (see Fig. 1). In this context, video conferencing is frequently used to support a knowledge discovery process (concerning the medical condition of the patient), as well as decision-making in the form of diagnosis and recommended protocols. There is widespread interest in utilizing medical video conferencing technology as an economical method to provide expert medical service to patients in remote and awkward locations, and to address misdistributions of health care resources (i.e., facilities and medical expertise) outside major urban centers [14,35]. There is also a growing recognition that

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[3] The term 'provider' includes all individuals who participate in the delivery of health care in telemedicine. These individuals include physicians, nurses and other medical assistants, administrators, as well as technical staff who support the telemedicine equipment.

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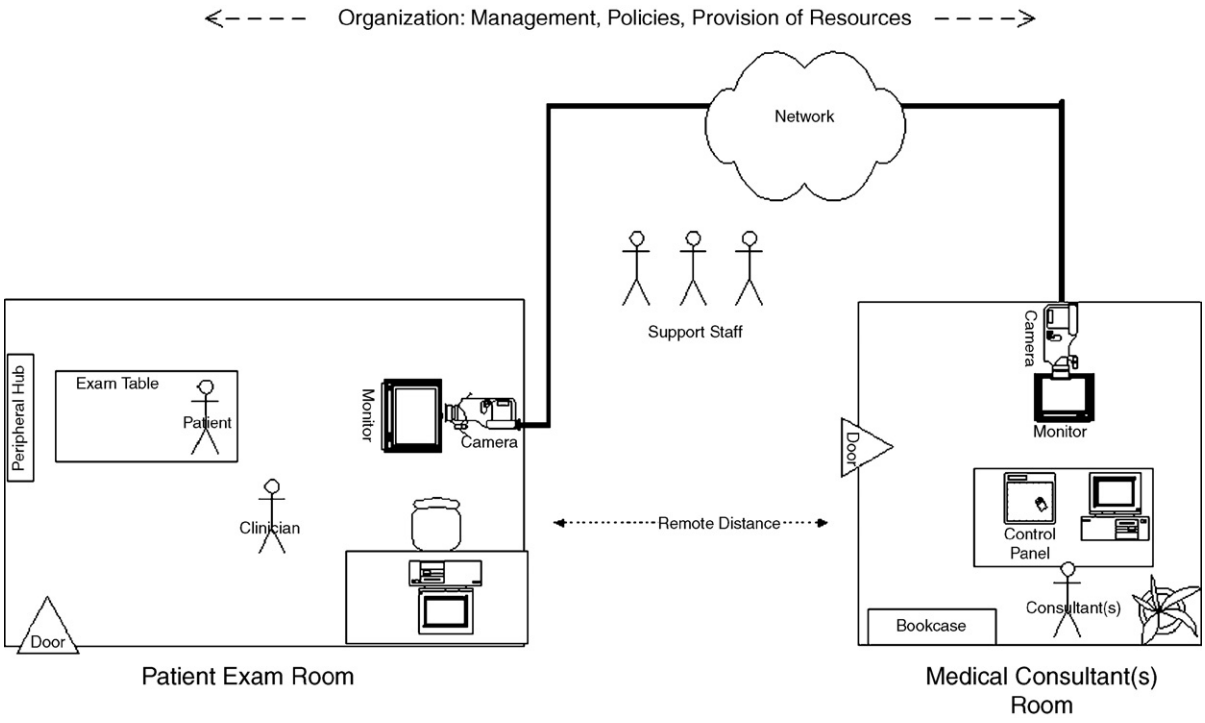

Fig. 1. Medical video conferencing layout [30].

telemedicine can facilitate the timeliness of medical care by providing access to a wider range of appropriate medical providers during the 'golden window' of treatment opportunity [13].

Advocates of telemedicine believe that telemedicine encounters (e.g., medical video conferencing) should be recognized as a "timely technology to facilitate health decision-making and clinical service support." These encounters address patients' needs for communication and caring, as well as physicians' concerns for high quality clinical care, while having a positive financial impact on containing medical costs (especially after policy and reimbursement constraints are addressed by governing bodies) [27]. In broad terms, the quality of this kind of technology-based service encounter may be described as the expected level of performance and information provided by the organization, technology, employee and, to some degree, customer (as indirect user of the technology) to support the interaction and transaction success [31]. To pronounce a medical video conferencing encounter a success, decisions regarding suitable care and patient satisfaction must be supported by the effective use of the socio-technical system.

Since this form of telemedicine promises to bridge geographic distances in the provision of medical expertise, it is of great concern that mixed results have been reported in terms of utilization rates, even when external issues such as reimbursement issues and policy constraints are not major impediments (e.g., [31,50]). These mixed results suggest that telemedicine-related research should not merely recognize constraints imposed by organizational and legislative policy, but should also look deeper into the telemedicine system as an integrated socio-technical process and product in order to assure its successful utilization. As stated by Jennett et al., "Telehealth systems can have impact at three levels: the health system level, the program level, and the patient encounter level. Each level requires different types of evaluation models" [26] (p. 364). Telemedicine researchers recognize that there is a paucity of explanatory research that predicts and facilitates the success of telemedicine encounters [45].

In our study of telemedicine encounters, we attempt to address this research gap by introducing the term *use quality* to address the effectiveness of the actual encounter usage. In the case of medical video conferencing, *use quality* spotlights the attributes of the socio-technical decision-making process of utilizing telemedicine for patient diagnosis and assessment.

The exploration of *use quality* focuses on work practices and methods of organizing work. Though such studies are needed as a basis for the formation of "post-