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A horizon scanning system for identifying new telehealth innovations.

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Abstract: The paper presents the development of a new horizon scanning tool to identify recent innovations in telehealth technologies; specifically, those that are relevant to the care and management of long-term conditions (LTCs). It also discusses the issues regarding matching appropriate technologies with relevant applications.

Introduction

The telehealth technologies sector has recently begun to develop at a great pace. Several multi-national companies have entered the sector, including some not traditionally associated with healthcare. This is a reflection of ever greater demands on health and care services to support the increasing older population, particularly those with LTCs. The technologies employed are continually changing. This is set to continue with a greater role for Information and Communication Technologies in reformed healthcare delivery [1].

To ensure deployment of innovative but effective telehealth services requires that the technologies are evaluated. In a large project [2] the authors are seeking to separately evaluate both post-proof of concept and newly marketed technologies.

Horizon Scanning is an approach to identify and prioritise new innovations to inform decision makers about their likely impact [3]. It provides a ready and systematic searching method. This paper presents the development of a new horizon scanning tool to identify recent innovations in telehealth technologies and discusses the issues regarding identifying appropriate technologies with relevant applications.

Method

The new telehealth horizon scanning system (THSS) being developed at the University of Sheffield uses established information-gathering protocols from general health technology innovation tracking [4]. That is, the THSS (Fig. 1) uses a systematic process of automated searching and filtering of

conventional telehealth-related, web-based information sources. These include bibliographic databases, technology news sites, industry press releases, and conference proceedings. More broadly it will also search, using keywords relating to technologies and/or health, for new innovations in other industry sectors, such as electronic medical devices, computing and communications. Automated searching of information sources will occur every 3 months using *Copernic Agent* meta-search engine. Additionally, Really Simple Syndication (RSS) feeds from identified websites will provide weekly updates. Key stakeholders (clinicians, practitioners, academics) and selected telehealth companies will be also be consulted to identify new products.

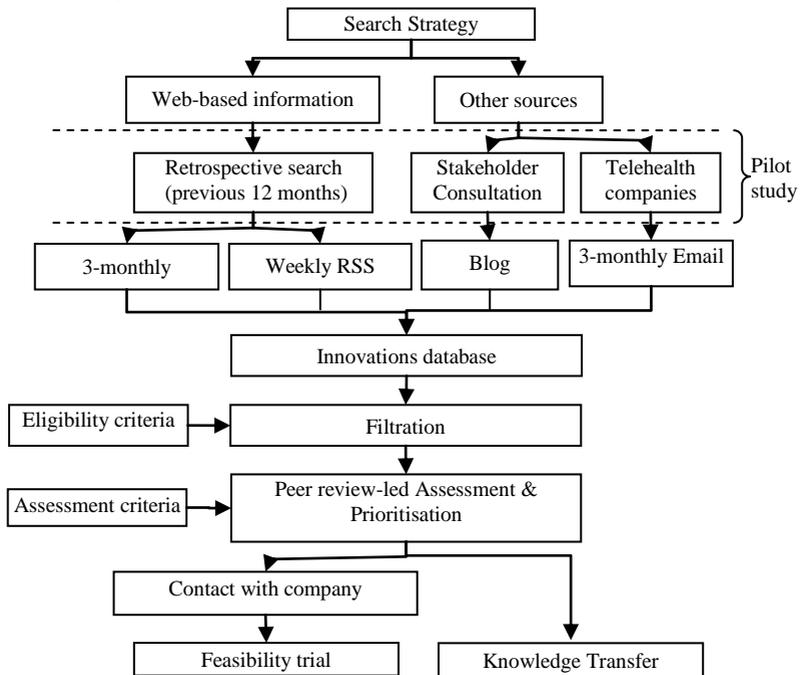


Figure 1. Schematic of telehealth horizon scanning system

References for retrieved technologies will be stored in a database. The reference history of the identified technology will be cross-checked to ascertain its development and to establish eligibility.

Inclusion criteria will be used to filter relevant technologies, as follows:
 1) *Technology type*: any device, sensor or whole system which is electronic, home/community-based and allows the remote transfer of information; 2)

Development stage: new or emerging technologies which have yet to be trialed; 3) *Deployment level*: very limited or no deployment in a healthcare setting. Other filtration criteria will include the applicability to LTC care, innovativeness, and the anticipated clinical and economic impacts. The intention is to automate filtering as much as possible but some will always require a panel of experts.

A peer-review process will assess and prioritise the potential impact of the technology on the care and management of specific LTC patients, and on the healthcare system. When a suitable technology is identified, its potential for the care of people with long term conditions will be explored through small scale trials. Allied health and social care practitioners will be kept up-to-date regarding new technological opportunities through knowledge transfer conduits.

As part of a pilot trial, technology-related keywords were used to search for articles published in the *Journal of Telemedicine and Telecare* (JTT) and the health technology website ehealthnews.eu in the previous 12 months. Articles were reviewed to identify the number of new or emerging technologies with application for LTCs.

Results and Discussion

Pilot Study

Table 1 shows the results from the initial pilot study. Out of 484 articles, 41 were selected for further review. From these, 16 products were identified as new or emerging, innovative technologies with defined or clear applications for LTC.

Table 1. New technologies identified in the previous 12 months

Source	Search hits	New products	LTC application for new product			
			Stroke	Diabetes	Dementia	Other/Not defined
JTT	77	5	2	2	0	1
ehealthnews.eu	407	11	1	2	1	7
Total	484	16	3	4	1	8

The other 25 excluded articles described technologies that have been established on the market for several years and therefore regarded as not novel. The 16 new technologies identified were classified as: vital-signs/physiological monitoring (4); movement sensors (2); GPS-enabled location device (2); web-based decision assistants (1); exercise/gaming systems (1); hand-held text reader (1); multi device, integrated telecare/telehealth systems (5).

From the small pilot trial using only two information sources, it is evident that a number of new technologies with potential LTC applications have been developed (or at least publicised) in the previous 12 months. These could be identified by an automated THSS.

A certain level of automation is required to ensure that the THSS is human resource efficient. However, this may cause several risks to the quality of the system's output. Firstly, the accuracy of the initial search results will be governed by the search terms and sources of information used. Secondly, there is likely to be duplication from multiple information sources. Thirdly, the innovativeness of the technology may not be readily established. Automated tracking of the product's reference history may identify if it is already commercially established. Further work is required to establish what elements of the system can be automated and what control measures are required.

A key part of the THSS is the role of peer-reviewers to assess and prioritise the identified products. However, different types of reviewers (e.g. academics, clinicians, health economists) may prioritise technologies differently. There also may be issues regarding how to secure agreements with technology manufactures to trial products (e.g. intellectual property rights, non-disclosure agreements, etc.)

It is too early to draw conclusions on the effectiveness or the level of automation possible. In the end the value of the THSS will be determined on how the information can be translated into potential trials of the technology and later deployed in healthcare settings. However the process and outputs also have wider value in identifying telehealth technology development patterns, and in generally informing workers in the field of innovations.

Acknowledgements

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