

# Untangling the Complexity of Connected Health Evaluations

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## Problem Statement

Connected Health, which involves the application of ICT to support healthcare delivery is an emerging trend across health informatics.

However evidence is lacking about how Connected Health technologies impact users and other stakeholders [1] and what are the best practices for assessing impact. Therefore, to support adoption of Connected Health an evaluation model is needed.

Considering the growth in Connected Health, it is pivotal that comparative studies can be conducted. A robust evaluation technique that considers the impact of Connected Health on society is a vital enabler for this.

Therefore, our research question is:

***How can we holistically evaluate the impact of Connected Health technologies from different stakeholder perspectives?***

**Context:** application of a Connected Health solution for primary care based dementia patients in Ireland.

## Background

A review of the literature reveals that while specific instances of the evaluation of Connected Health exist there is no evidence of generic Connected Health evaluation models that have been successfully implemented and applied across the area. Therefore, we have looked within the health information system (HIS) literature for evidence of evaluation of technology in healthcare.

There is evidence which suggests that modifying the DeLone and McLean IS Success Model (Figure 1) for particular studies can derive context specific evaluation frameworks.

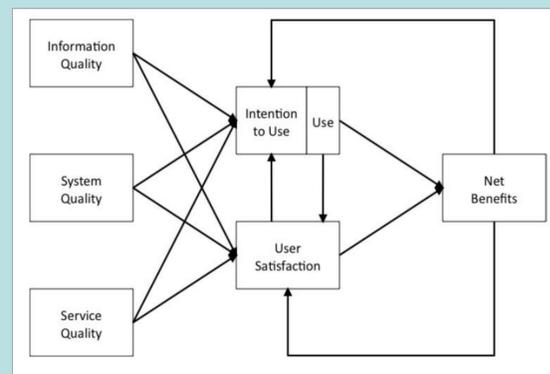


Figure 1. The IS Success Model [2]

## Research Approach



	Technology Provider	Service Provider	Assisted Persons	Society
<b>System Quality</b>	Is the solution built right?	Is the solution fit for purpose?	Does it work as expected?	Does society benefit from improved service quality?
<b>Service Quality</b>	Does the technology provider support the solution?	What Service Level Agreements are in place?	Is there adequate support for users?	Does society benefit from good solution support?
<b>Information Quality</b>	Do technology providers ensure users get quality information in and out of the solution?	Is the information quality high?	Will assisted persons have access to quality information?	How will society become more informed through the solution?
<b>Acceptability</b>	Are the technology providers encouraging users acceptance of the solution?	Will the users accept the solution?	Do assisted persons want this solution?	Will society accept the solution?
<b>Usability</b>	How usable is the technology providers solution?	Will the users be able to use the solution?	Can assisted persons use this?	How has the solution impacted on their behaviour?
<b>Clinical</b>	What clinical value are the technology providers offering?	What are the clinical benefits to users' and society?	How will this benefit assisted persons health?	How can the solution improve clinical care for society?
<b>Economic</b>	Can technology providers make a profit?	What is the Return on Investment (ROI)?	How much will this cost assisted persons?	How much will this cost society?

Table 1. Connected Health Evaluation Framework

Stakeholder Group	Description
Technology Provider	Provides Connected Health technology to their clients. This term also covers technology suppliers that builds soft- or hardware that is integrated into the ARCH platform.
Service Provider	Provides health services. The term also covers the individual service provider who works for a service organisation, including nurses, general practitioners, physiotherapists, gerontologists, and welfare workers. These are also called formal caregivers.
Assisted Persons	A person who is dependent on health services due to old age, a chronic disease or a handicap. A person who is indirectly dependent due to responsibilities for an elderly parent, family member, friend or a spouse.
Society	Government at the local, regional or national levels that allocates funds to Connected Health technologies or services.

Table 2. Stakeholder Groups

## Summary of Key Findings

To take advantage of the promised benefits of Connected Health, providers need to understand how a deployment is performing and where progress is being achieved in improving patient care. This calls for a systematic assessment of a deployment.

We proposed the Connected Health Evaluation Framework (Table 1) to assess the impact of Connected Health solutions from multiple stakeholder (Table 2) perspectives and multiple innovation perspectives.

During the development and application of our evaluation framework, we structured and framed a holistic assessment for Connected Health technologies. During this time we learnt that Connected Health evaluations should be:

- **Tailored** to support insights around achieving the vision and strategy for healthcare delivery;
- **Holistic**, covering all HIS that make up the healthcare system;
- **Comprehensive** in capturing how performance would change based on introduction of connected solutions;
- **Comparative**, to allow benchmarking healthcare providers performance against relevant peer providers.

### References

- [1] S.V.Rojas and M.-P. Gagnon, "A systematic review of the key indicators for assessing telehome care cost-effectiveness," Telemedicine journal and e-health, vol. 14, no. 9, pp. 896-904, 2008.
- [2] W. H. DeLone and E. R. McLean, "The DeLone and McLean model of information systems success: A ten-year update," J. Manage. Inf. Syst., vol. 19, pp. 9-30, Apr. 2003.

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