Chapter 4

Factors Affecting the Sustainability of Computer Information Systems:
Embedding New Information Technology into a Hospital Environment

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ABSTRACT

This study explores the issues and barriers to developing a sustainable system for the collection of quality of life data in hospitals. A set of sustainability factors was identified and tested in a study that introduced tablet computers to collect questionnaires from cancer patients. These factors are considered a good starting point for practitioners and researchers to use in other IT contexts if they wish to develop sustainable information systems.

INTRODUCTION

The 2003 CHAOS Chronicles report (The Standish Group, 2003) shows an increase of project success rates to 34%, which, although still very low, was actually a significant improvement on the 16% reported in 1994. However, put the other way, two thirds of projects still either fail or are ‘challenged’ as Standish defines it. The Standish Group estimated US IT projects wasted US$140 billion ($80 billion in failed projects) against $250 billion in project spending (The Standish Group, 2003). Although in recent years there have been improvements in success rates (Johnson, 2006), the authors contend that given the huge amount of investment and focus in I.T. over many decades,
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such failure rates are an extraordinary and embar-
issing statistic. Therefore, the question must be
asked: in what ways is the I.T. community unaware
of or poor at building systems that stand the test
of time? How do technological factors (such as
introducing new technology) affect sustainabil-
ity? Are there social factors associated with the
preferences of individuals that over time cause
information systems to atrophy or be accepted?
To what extent do organisational and economic
imperatives play in determining sustainability?
It seems clear that in a climate of continuing
high failure rate of projects, it is imperative that
researchers re-examine factors that contribute
towards the long term sustainability of informa-
tion systems that are being developed.

Whilst the research in this paper concerns the
use of tablet computers, it is suggested that many
of the issues and challenges reported relate to
adopting new computer technologies in general
and not only in healthcare settings. Indeed, the
term ‘technostress’, now widely used, defines the
stress experienced in the process of adopting and
accepting new technologies, particularly comput-
ers (McDermid, 2008). Whether the technology is
a mobile phone, personal digital assistant or audio
player, humans are constantly being asked to as-
similate more and more complicated technologies
to a point where arguably they will use the tool
reluctantly and perhaps superficially or not use the
tool at all. So this proliferation of new technolo-
gies in our workspace raises important questions
about how we deal with technology adoption.

Although the specific research questions
guiding this paper concern the sustainability of
computer systems in hospitals, discussion in this
paper also relates to factors that would appear to
relate to the sustainability of computer systems in
general, since many of the issues raised concern
how people relate to technology and also the
processes we use to develop systems. Therefore,
this paper will attempt to provide a framework for
practitioners and researchers to apply and manage
sustainability criteria not just in hospitals or with
tablet technology but across a variety of projects.

BACKGROUND

Although an increasing number of research studies
in hospitals employ regular collection of quality
of life information, obtaining good reliable data
has traditionally been considered problematic. For
example, patients are frequently asked to complete
a multi-item questionnaire of over 100 questions.
Completion of all relevant items is of necessary
for research conclusions to be significant, yet with
paper-based systems, up to 10% of questionnaires
are incomplete through, for example, patients
being unaware that they have missed certain sec-
tions (Streiner & Norman, 1995). This has serious
implications since a cause for missing items can
be personal problems in that area, and hence these
personal problems, in research studies, are almost
certainly underreported.

A second problem in these studies is the concern
that the feedback obtained is not representative
of the whole population undergoing treatment.
More specifically, although clinical studies now
try to recruit a representative sample of patients
there is a concern that feedback, whether paper or
computer based, tends to be more easily obtain-
able from younger and fitter patients. Therefore
the data may be skewed, which in turn creates
problems in generalising the conclusions. Possible
reasons for this include:

- Elderly patients who are negatively dis-
  posed towards technology,
- Patients with weakened cognitive func-
  tions due to medication or illness,
- Patients who have difficulty in reading or
  whose eyesight is poor.
- Patients whose concentration is affected
  because of anxiety.

A related issue is the fact that a single, uni-
versal approach to data collection system will
not work for all patients. It is important that the
patient’s capabilities and preferences are taken
into consideration when planning a data collection
system. For example, some patients may not be