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Evaluating Benefits of a Large Domiciliary Nursing Workforce Using Mobile Computers

Ian Cash, Julianne Oorloff

Information Services Division, Royal District Nursing Service, Melbourne, Australia

Abstract

In 2003, Royal District Nursing Service (RDNS) rolled out a Mobile Computing System (MCS) to approximately 800 domiciliary nurses and allied health staff working in the greater Melbourne Metropolitan area, providing real time access to client and visit information as well as email, intranet, internet and office suite applications.

In 2005 RDNS initiated a formal evaluation of the MCS which focussed on seven key themes: client care; work practice; use; satisfaction and value; system cost and saving, system management and support model and technical performance.

The detailed findings were gathered using an online survey ,workshops with clinicians, administration and support staff at regional Centres, accompanying clinicians "on the road", interviews with Managers and Executives and review of documentation. This paper will present a number of the outcomes that informed the key summary of findings of the RDNS MCS experience to date – telling it "As It Is":

1. There has been a very successful deployment of the MCS across RDNS
2. The nursing staff are positive about having and using the MCS. There is a large "bank of goodwill" towards it and they would welcome enhancements.
3. There have been issues with MCS reliability and functionality that degrade benefits, productivity and satisfaction
4. The MCS significantly achieves RDNS objectives in relation to visit management but there is more work to do in relation to the MCS improving client care.

The evaluation of the MCS has provided insights relevant to many health care providers looking to implement mobile computing to improve health service delivery. RDNS has achieved this on a large scale and our experience can help inform the planning of other health organisations wanting to make the best possible use of information, and communication technologies in a sustainable health system.

Keywords:

mobile computing, evaluation, nursing informatics

Introduction

RDNS' Mobile Computing System (MCS) has been fully operational with more than 800 field staff users since 2003. Heading into 2006/2007, RDNS faced an imminent and significant outlay to refresh the technology, particularly the portable computing devices (tablets). In this circumstance, it was prudent and timely for RDNS to undertake a comprehensive evaluation of the MCS as it is and to review possible future directions for the system.

RDNS engaged Opticon Australia to undertake the evaluation. Opticon has provided a comprehensive "As it Is" picture of the current MCS, a detailed assessment of the value RDNS is presently enjoying from the current MCS along with the value it can expect to extract in the future, and recommended actions RDNS should take in the short and medium term to assure the sustainability of the MCS in to the future.

How was the evaluation conducted?

The evaluation process was done in four stages, Information Collection, Analysis into Findings, Evaluation of the MCS, and Recommendations.

Information collection

Opticon partnered with the RDNS project team and a broad and deep cross section of RDNS personnel to collect comprehensive information to inform the evaluation. In a first stage, this included:

- A review of a large body of documentation;
- Interviews with senior management and persons in positions of key relevance to the MCS;
- Three workshops involving clinicians and administrative staff from a cross section of Centres;
- Field visits by Opticon consultants to four centres to observe first hand work-a-day use and issues relating to the MCS; and
- A comprehensive survey completed by more than 400 staff.

Since more than 400 field staff provided survey responses, the interpretation of the results assumes that the survey response is truly representative of all field staff.

The information collection provided a repository of material on which RDNS and Opticon believed analysis, evaluation and recommendations could proceed with a high level of confidence.

Analysing the information collected into findings

The survey statistics were interwoven with the qualitative information collected in the interviews, workshops, field visits and documentation review. This combination formed a comprehensive picture of the MCS "As It Is".

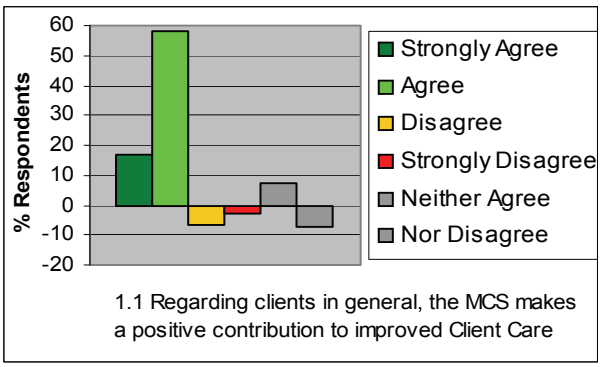
Introduction to detailed findings

The Detailed Findings are structured in line with the Themes and Key Questions specified by RDNS. These are shown in the table below.

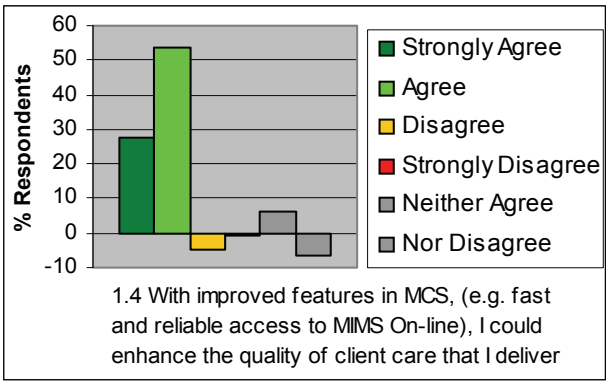
Theme	Key Question
Client Care	Is the system improving clinical care?
Work Practice	How has the system impacted work practices and stakeholders at RDNS?
Satisfaction and Value	Is the system judged to be useful and valuable to stakeholders?
System Cost and Savings	Is the system value for money?
Use	How usable is the system?
System Management and Support	How effective is the system management and support model?
Technical Performance	How well is the technology working?

Is the system improving client care?

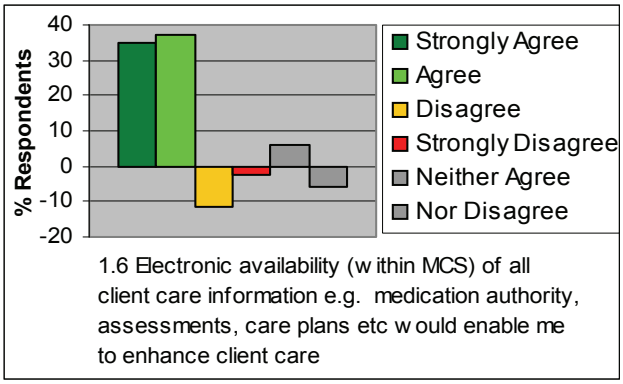
What we found is that there is a strong impression that MCS has improved client care in a general sense, as shown by chart 1.1.



1.1 Regarding clients in general, the MCS makes a positive contribution to improved Client Care



1.4 With improved features in MCS, (e.g. fast and reliable access to MIMS On-line), I could enhance the quality of client care that I deliver



1.6 Electronic availability (within MCS) of all client care information e.g. medication authority, assessments, care plans etc would enable me to enhance client care

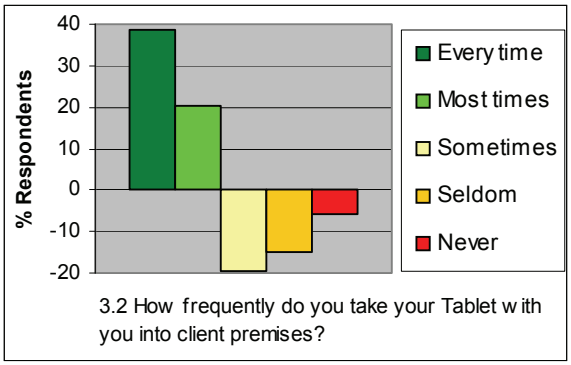
It was also found that the current system is more about static client information and visit management information but that enhanced functionality would further enable the enhancement of client care.

How has the system impacted work practices and stakeholders at RDNS

Using the tablet in the client's home

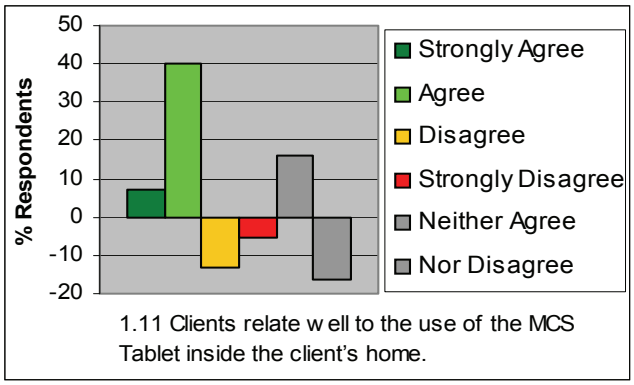
Information from workshops, field visits and the survey indicated that clinicians have mixed practices and views about using the tablet in the client's home.

Chart 3.2 shows that 60% of `clinicians take their tablet into the client's home most visits. But about 40% take the tablet in to the client's home sometimes, seldom or never.



3.2 How frequently do you take your Tablet with you into client premises?

Chart 1.11 shows clinicians have quite mixed views about how comfortable their clients feel about the clinician using the tablet ("a computer") in their home.



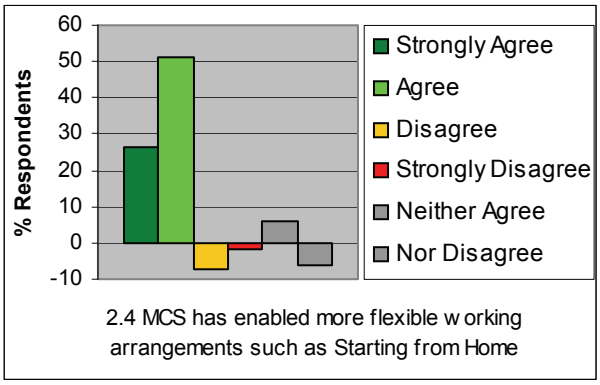
1.11 Clients relate well to the use of the MCS Tablet inside the client's home.

Feedback from the workshops and field visits provided some further insight into MCS usage during client visits. Participants reported on the one hand that MCS makes vital visit information available on site. On the other hand, they also reported that the tablet/MCS tends to become "irrelevant" in the face to face client interaction. The client interaction with the clinician is strongly identified as a trusted relationship. Clinicians voiced significant concerns relating to the potential of "with client" use of tablets creating a barrier or intrusion into that interaction.

Visit management work practices

In workshops and field visits, clinicians indicated that the MCS:

- Facilitated better visit management by making relevant information more accessible;
- Helps optimise staff resources – e.g. by facilitating client exchange 'on the road'; and
- By accurately recording travel time revealed that when not using MCS, travel time tended to be underestimated.

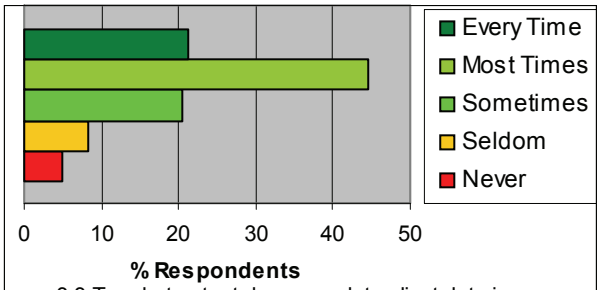


2.4 MCS has enabled more flexible working arrangements such as Starting from Home

Maintaining up to date information in MCS

An important issue for both clinicians in the field and Centre Support management in Centres and Head Office is maintenance of up to date information in MCS.

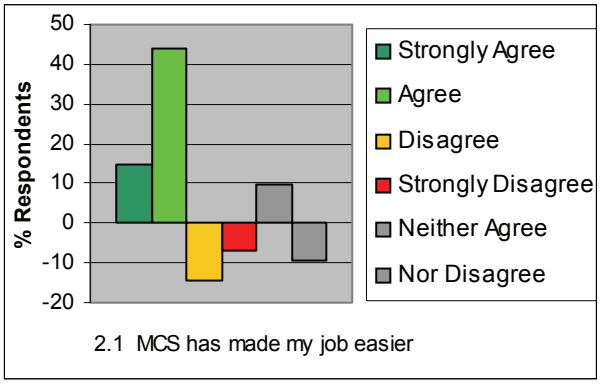
The preferred practice for field clinicians is that they update their schedule "on the road" at least once as well as at start and finish of their shift. Chart 3.6 shows that this standard is practiced by more than 80% of field staff.



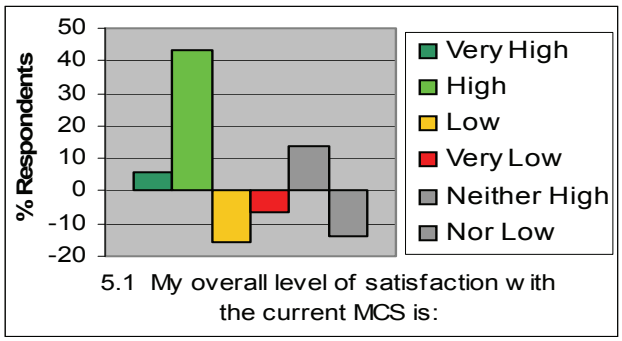
3.3 To what extent do you update client data in Gemino during or immediately after each client visit?

How satisfied are clinicians with MCS?

There was an overall positive feeling towards the MCS and staff generally felt it made their job easier.



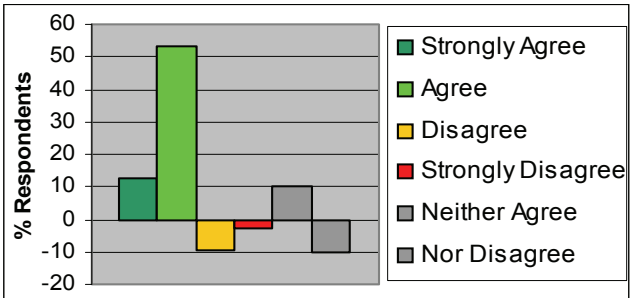
2.1 MCS has made my job easier



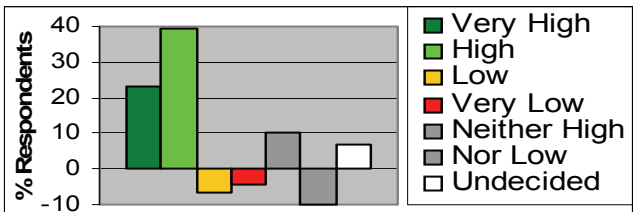
5.1 My overall level of satisfaction with the current MCS is:

Is the system value for money?

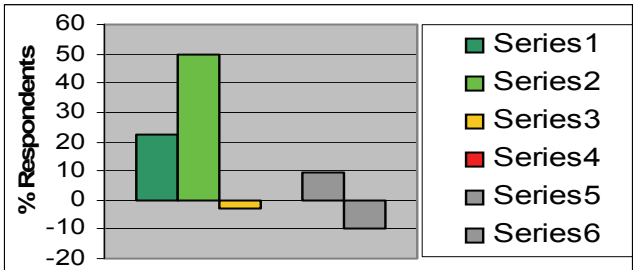
At the clinician level, chart 6.2 shows that MCS is regarded a tool with high value.



6.2 MCS is high value as an integral part of my working tools for delivering client care



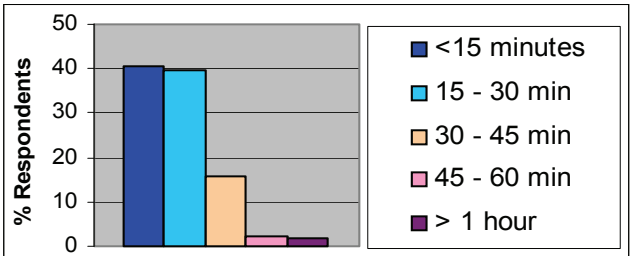
7.4 In my view, the value of MCS to RDNS in delivering more units of direct care each day due to starting and/or finishing from home is:



7.3 The value of MCS to both RDNS and me in reducing invoicing errors is:

How usable is the system?

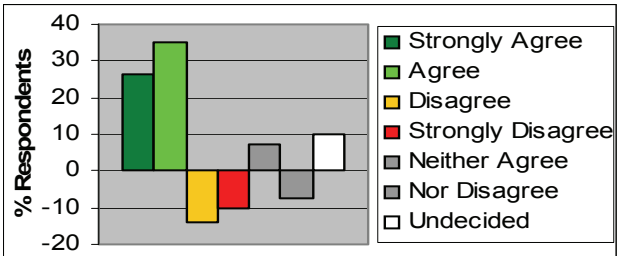
Perhaps the most telling finding in regard to usability is the amount of time clinicians expend each day dealing with various malfunctions in the MCS.



8.7 On average, how much time per day do you lose because for whatever reason you have to restart your tablet or reconnect or restart Gemino etc

What would improve usability?

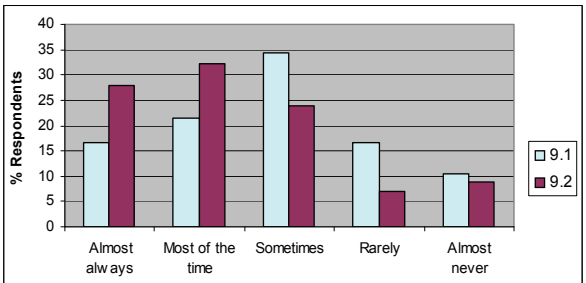
What would clinicians want to improve usability? Findings already reported have noted that the current MCS provides functionality more directed at visit management than client care. Chart 4.1 highlights clinician attitudes to some aspects of strengthening the client care toolsets in the MCS.



4.1 I would prefer to record progress notes at the time of each visit by using drop down menus to click on standard descriptions and terms rather than typing in progress notes using the keyboard

How effective is the system management and support model?

Under the RDNS model for system management and support, clinicians should go to their centre AO/CO for first level support and the IS Support Centre for second level support. In reality, practice seems to conform more to a free choice model.



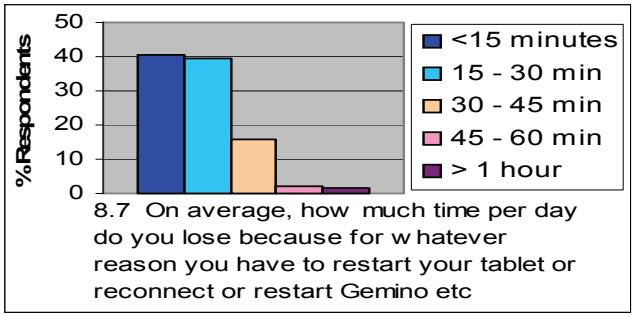
9.1 My first approach for support is to the Support Centre

9.2 My first approach for support is to the Centre AO/CO

How well is the technology working?

Reports from both the field and IS have indicated that tablets degenerate at an increasing rate as they age.

Changing batteries, re-entering data, restarting the tablet, unresponsiveness and re-attempting connections all not only add to the day's frustrations but take up clinician time. Feedback on recently replaced tablets was very positive.



Summary of findings – telling it "As It Is"

Four key big picture findings summarise the RDNS MCS experience to date:

1. In Opticon's view and experience, the successful deployment of the MCS across the 800-plus RDNS field staff is a great achievement;
2. Overwhelmingly, the field staff are positive about having and using the MCS. There is a large "bank of goodwill" towards it and they would welcome enhancements;
3. There are significant issues with MCS reliability and functionality that are frustrating to both users and support staff and seriously degrade benefits, productivity and satisfaction; and
4. The MCS significantly achieves RDNS objectives in relation to visit management but significantly under achieves RDNS objectives in relation to improved client care.

Conclusion

What RDNS has achieved in its MCS is a noteworthy success. There is widespread penetration and acceptance. The MCS has become an indispensable tool for visit management. Further, the significant bank of goodwill amongst users augurs well for introducing future enhancements.

At the same time there are performance issues and problems that detract from the positives There is also a shortfall in functionality that means the always-held ambition of using MCS to improve direct client care has not fully been realised and cannot be realised without further software development or replacement.

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Address for correspondence

31 Alma Road
St Kilda 3182
Victoria, Australia
Author contact details
Julianne Oorloff
Information Services
joorloff@rdns.com.au